Pagosa Springs Medical Center
Emergency Medical Services

Protocols

v2026May01

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FORWARD

The following protocols are intended to define the standard of care for EMS providers in the Pagosa Springs Medical Center EMS division and delineate the expected practice, actions, and procedures to be followed. To the extent possible, the treatments and procedures identified in these protocols are evidence based and the result of validated clinical research and EMS system clinical data.

These protocols are not intended to be absolute treatment doctrines, but rather, guidelines which have sufficient flexibility to meet the complex challenges faced by the EMS provider in the field

No protocol can account for every clinical scenario encountered, and the PSMC EMS Medical Director 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 by the agency's CQI/QA program in a timely fashion

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

All EMS personnel are required to use the protocols appropriate to their certification.

OVERARCHING CARE GOALS

All patient care/contact should be governed by the following priorities (in no particular order after the first):

- Reverse life threats
- Slow the progression of time sensitive illness and injury
- Alleviate fear and minimize pain
- Inform and educate the patient and family
- Be respectful of the needs of all people involved
- Maintain the dignity of the patient, family and bystanders

(Continued)

Daniel Renner M.D. provides medical directions for PSMC EMS. These protocols represent the delegated standing orders of Dr. Renner, in accordance with the Colorado Department of Public Health and Environment, Chapter Two - Rules Pertaining to EMS Practice and Medical Director Oversight. Providers covered will maintain current CDPHE licensure/certification. Providers will also demonstrate skill competency by way of routine review, evaluation, and validation.

Dr. Renner, or his appointed designee, has the explicit capability and responsibility to authorize, limit, amend, revoke, suspend, or terminate a provider's ability to practice under these standing orders

Protocol version : 2022

_____
Chief Jason Webb, NRP

This document establishes parameters of off line, delegated medical orders to credentialed pre-hospital providers under my supervision. I hereby authorize provision of medical services as described herein, using equipment and supplies noted in the text and appendices of this document.

_____
Daniel Renner, MD
Medical Director

Effective: May 01, 2026

ADULT AND PEDIATRIC DEFINITIONS FOR CLINICAL TREATMENT

For the purposes of treatments per these protocols, the following definitions apply:

- Neonate – less than one month
- Infant – one month to less than one year old
- Pediatric – one year to 12 years old
- Adult – age greater than 12 years old

The pediatric notation as used in this document refers to Neonate, Infant and Pediatric unless age or weight specific limits are specified.

Pediatric doses are based on ideal body weight (refer to chart below). **Unless otherwise noted the pediatric dose should not exceed the adult dose for a given medication.**

These definitions of adult and pediatric patients apply to clinical treatment only and should not be used for legal purposes of consent and refusal.

PEDIATRIC IDEAL BODY WEIGHT

This chart is based on the Handtevy Pediatric System.

AGE	IDEAL BODY WEIGHT
Preemie	2 kg
Newborn	4 kg
4 months	6 kg
6 months	8 kg
1 year	10 kg
2 years	12 kg
3 years	15 kg
4 years	17 kg
5 years	20 kg
6 years	22 kg
7 years	25 kg
8 years	27 kg
9 years	30 kg
10 years	35 kg
11 years	40 kg
12 years	50 kg

BASE CONTACT FOR PHYSICIAN CONSULTATION

The nature and complexity of medicine in the pre-hospital setting guarantees that not all treatments appropriate for each patient and situation can be exhaustively addressed herein. While some treatments may be inappropriate or not possible for a given patient, others may be appropriate and not included.

The purpose of online medical control is for immediate consultation with a physician regarding patient care. The designated medical control for the PSMC EMS is the emergency physicians at Pagosa Springs Medical Center. Other physicians or health care providers may advise and assist with patient care as long as their assistance conforms to the designated protocols. Refer to *0100 On-Scene Medical Provider Protocol*

Medical control should be contacted whenever consultation or direction is deemed necessary. It is appropriate and encouraged whenever there is a question regarding a treatment, a procedure, or the destination of transport.

- In any case of non-transport including refusals, AMA refusals, and treat-and-release, medical control may be contacted for approval and to assist in attempting to convince the patient to accept treatment/transport if considered prudent. See *0120 Refusals protocol*.
- All deaths called in the field where it was determined the efforts would be futile for TOD documentation.
- All field pronouncements where resuscitation efforts were unsuccessful for consultation and TOD if applicable. See *0080 Field Pronouncement Protocol*
- For patients requesting transport to facilities other than the closest appropriate emergency department that do not meet our guidelines to do so, contact the admin on call for operational guidance and medical control for permission.

CONFIDENTIALITY

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:

- The patient consents in writing
- 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)

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.

- Exceptions:
    - 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.
    - The patient is not entitled to confidentiality for disclosures made publicly.
    - The patient is not entitled to confidentiality with regard to evidence of a crime.

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 PSMC’s HIPAA policy and procedures.
6. Any communication from the prehospital setting to the receiving hospital should be kept in compliance with HIPAA including all smart technology, SMS messaging, wireless communication or otherwise. No personal identifier information should be transmitted over non-HIPAA compliant secure means.

Questions or concerns related to PHI or the Heath Information Portability and Accountability Act (HIPAA) should be directed to the operational chain of command or the Hospital Compliance Officer.

CONSENT

In providing medical care, we recognize that the universal goal is to act in the best interest of the patient. This goal is based on the principle of autonomy, which allows patients to decide what is best for them. A patient's best interest may be served by providing leading-edge medical treatment or it may be served simply by honoring a patient's refusal of care. Although complicated issues can arise when providers and patients disagree, the best policy is to provide adequate information to the patient, allow time for ample discussion (including questions), and document the medical record meticulously.

With certain exceptions, as referenced in Implied Consent and Involuntary Consent (below), all adult patients and select minor patients have the right to consent to medical evaluation and/or treatment or to refuse medical evaluation and/or treatment, if they have legal capacity and the ability to make informed decisions.

General Principles

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

Four specific forms of consent apply to EMS.

Informed Consent –

Informed consent is more than a legality. It is a moral responsibility on the part of the provider, based on the recognition of individual autonomy, dignity, and the capacity for self-determination. With informed consent, the patient is aware of and understands the risk(s) of any care provided, procedures performed, medications administered, and the consequences of refusing treatment and/or transport. The patient should also be aware of the options available if he or she chooses not to accept evaluation, treatment, and/or transport.

(CONTINUED)

CONSENT

Implied Consent –

In potentially life-threatening emergency situations, consent for treatment is not required if the patient lacks the ability to make an informed decision. The law presumes that individuals with a real or potential life threatening injury or illness would consent to emergency treatment. In life-threatening emergency situations, consent for emergency care is not required if the individual:

- Cannot understand the nature of his/her medical condition and cannot communicate an informed decision to accept or refuse treatment
- Is a minor who is suffering from what appears to be life-threatening injury or illness and whose parent, managing or possessory conservator, or guardian is not present

Substituted Consent –

This is the situation in which another person consents for the patient, as is the case with minors, incapacitated patients, incarcerated patients, and those determined by courts to be legally incompetent.

The fundamental issue in informed, substituted consent for minors is a question of how decisions should be made for those who are not fully competent to decide for themselves. Parents or guardians are entitled to provide permission because they have the legal responsibility and, in the absence of abuse or neglect, are assumed to act in the best interests of the child. However, there is also a moral and ethical duty to respect the rights of every individual, regardless of age. Providers must walk a fine line between respect for minors' autonomy, respect for parental rights, and the law. See 0130 Pediatric Transport Protocol for further guidance regarding minors.

Involuntary Consent –

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

- Court order (Guardianship)
- A law enforcement officer may authorize transport of prisoners in custody or detention in order to be evaluated but cannot dictate treatment decisions.
- Persons under a mental health hold or commitment who are a danger to themselves or others or are gravely disabled.
- It is sufficient to assume the patient lacks decision-making capacity if there is a reasonable concern when any person appears to have a mental illness and, as a result of such mental illness, appears to be an imminent danger to others or to himself or herself or appears to be gravely disabled. Effort should be made to obtain consent for transport from the patient, and to preserve the patient's dignity throughout the process. However, the patient may be transported over his or her objections and treated under involuntary consent if the patient does not comply. See 0600 Mental Health Hold Protocol for further guidance.

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CONSENT

General Principles of consent: Minors

A parent, including a parent who is a minor, may consent to medical or emergency treatment of his/her child.

There are exceptions:

- 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.
- The consent of a parent is not necessary to authorize hospital or emergency health care when a first responder in good faith relies on a minor's consent, if the minor is at least 15 years of age and Emancipated or married.
- Minors may seek treatment for Prenatal, delivery and post-delivery medical care, abortion, diagnosis and treatment for STD, sexual assault, addiction, and/or alcoholism without consent of parents. Minors greater than 12 years old may seek treatment for mental health without parental consent.

When in doubt, your actions should be guided by what is in the minor's best interests and on line medical control.

Procedure: Minors

A parent or legal guardian may provide consent to or refuse treatment in a non- life-threatening situation.

When the parent is not present to consent or refuse:

- 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.
- 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, and/or 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.
- If the minor has a life-threatening injury or illness, transport and treat per protocols. If the parent objects to treatment, contact on line medical control immediately and treat to the extent allowable, notify dispatch law enforcement is needed to respond and assist.

IF YOU HAVE ANY QUESTION REGARDING CONSENT CONTACT MEDICAL CONTROL; IF THAT IS IMPOSSIBLE, IT IS PREFERABLE TO RENDER CARE IN "GOOD FAITH" WHICH MAY HELP REDUCE THE RISK OF LEGAL CONSEQUENCE FOR FAILURE TO TREAT AND/OR NEGLIGENCE.

• DO NOT LET FEAR OF LEGAL CONSEQUENCE PREVENT RENDERING CARE

- The best defense against any legal question of consent, decision making capacity, and the need for care, is a good prehospital care report.
- A written account of the patient and care rendered will be invaluable if legal questions are raised months later and will convey competence and adherence to standards of care

DETERMINING DECISION MAKING CAPACITY

While issues of capacity and competence are routinely determined through the legal system, capacity is also a clinical determination of a patient's ability to make their own decisions regarding their health. This is the standard that EMS professionals use to determine whether or not a patient can consent to or refuse treatment and/or transport to the hospital. The patient must be able to collect information, reason, and make decisions based on that information relative to individual objectives, values, and priorities.

While the legal definition of mental capacity is clear, the concept can become blurred in the clinical setting. A person can be temporarily mentally incapacitated for various medical reasons and, because of this, not able to process information to form reasonable understanding or make reasonable decisions.

Because of the nature of emergency medicine, some of those who can be considered incapacitated, however permanent or temporary the state, may encounter medical professionals. It is incumbent on the medical professional to recognize the needs of these patients with regard to provision of necessary care and transfer to definitive care should a reasonable risk of patient mortality or morbidity exist as evidenced by assessment findings and differential diagnosis.

In order to demonstrate medical decision-making capacity, patients must have both the legal and medical capacity to make decisions.

Legal decision-making capacity is established by law if the patient is/has:

- 18 years old or older or a legal guardian if the patient is 18 years old or older or a parent, conservator, or legal guardian of a minor, or other person who may consent for the minor by law or
- a minor who:
    - is legally emancipated or
    - is on active duty with the armed services of the United States of America or
    - A minor who is fifteen years of age or older who is living independently from his or her parents and is financially responsible for his or her own affairs is considered emancipated and can consent to all medical care.
    - A married minor may consent to all medical care
    - A minor of any age who is seeking care for Prenatal, delivery and post-delivery medical care, abortion, diagnosis and treatment for STD, sexual assault, addiction, and/or alcoholism.
    - Minors greater than 12 years old may seek treatment for mental health without parental consent.
    - is the parent of a child, and has actual custody of his or her child and makes decisions relating to the medical, dental, psychological, or surgical treatment for the child

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DETERMINING DECISION MAKING CAPACITY

Medical decision-making capacity requires the patient to be able to demonstrate:

- that they do not have altered mental status AND
- the ability to understand information and communicate a choice AND
- an understanding of the medical situation in laymen's terms AND
- an understanding of the treatment/transport options/alternatives available to them AND
- an understanding of the EMS' treatment/transport recommendations AND
- an understanding of the potential consequences of their decision AND
- a coherent rationale for their decision

If the patient does not meet ALL the above criteria, they should be considered to not have medical decision making capability and treated under either implied or involuntary consent as appropriate.

ADVANCE MEDICAL DIRECTIVES

General Principles:

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

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ADVANCE MEDICAL DIRECTIVES

Additional Considerations

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

Procedure

Upon finding a patient with a CPR Directive (form, bracelet, or necklace):

- Perform initial patient assessment.
- Verify that the information on the form or, if present, on the back of necklace or bracelet, appears to be appropriate for the patient (look at race, sex, date of birth, eye and hair color). If possible, try to verify identity of patient by an additional source (e.g., family member, driver's license or other readily available sources).
- Upon verification of the CPR Directive, withhold CPR. If CPR has been started, it should be stopped.
- If there is any question of the validity of the document or the identity of the patient, initiate full resuscitation measures and contact the base for guidance. Be sure to inform the medical control of the CPR Directive form, bracelet, or necklace, and the condition and history of the patient.
- Complete documentation - In addition to the standard documentation, the following information should be documented when possible by the prehospital provider on the run report:
  - Patient's status (e.g. condition found, medical history obtained)
  - Type of "CPR Directive" found (document, bracelet or necklace)
  - CPR Directive number, if available
  - Name of attending physician, if known
  - Special circumstances which justify initiating resuscitation if this was done despite the presence of the CPR Directive
- Provide appropriate emotional support to family if possible.
- If the death occurs outside of a health care facility or if tissue donation has been declared, then law enforcement is to be immediately contacted. If the declarant has indicated on the CPR Directives form a desire to donate any tissues, appropriate authorities should be notified.

FIELD PRONOUNCEMENT OF DEATH / TERMINATION OF RESUSCITATION

Purpose

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

EMS providers should try their best to determine a patient's end-of-life wishes and honor them. (Refer to 0070 Advance Medical Directives protocol for discussion of advanced directives and decision making about appropriateness of performing or withholding resuscitation efforts.)

Do not attempt resuscitation for patients with a "No CPR" directive based on the patient's wishes or compelling reasons to withhold resuscitation as covered in Advanced Medical Directives protocol.

Withholding CPR

Initiation or continuation of CPR is not indicated in the pulseless, apneic patient in the presence of:

- Livor Mortis
- Decomposition
- Rigor Mortis
- Obvious mortal wounds (e.g., trauma with non-survivable organ destruction)
- Presence of valid Advance Directive stating "Do Not Resuscitate"

Termination of Resuscitation

Authorization for termination of resuscitative efforts should be sought if it is likely that there is not going to be a change in patient condition despite all appropriate efforts as described elsewhere in this document (refer to 2110 Cardiac Arrest protocol)

Such authorization should be obtained via recorded telephone connection, whenever available.

Below are guidelines for requesting termination:

Medical Arrest

- Patient is not pregnant
- All underlying causes have been considered and addressed
- No evidence of neurologic activity (eye opening, motor activity, meaningful respiratory activity)
- All appropriate treatments have been provided
- In general, all adult medical arrests will be aggressively resuscitated for at least 30 minutes, except for those with an $EtCO2 < 10$ mmHg after 20 minutes of resuscitation.

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FIELD PRONOUNCEMENT OF DEATH / TERMINATION OF RESUSCITATION

It is acceptable to contact Medical Control in the event of unusual circumstances or if conflict arises

Blunt Trauma Arrest

- Consider field pronouncement if there are no signs of life. Signs of life include spontaneous movement, breathing, presence of a pulse, or reactive pupils.
- Consider Finger Thoracostomy.

Penetrating Trauma Arrest

- Resuscitation and transport are generally indicated
- Consider field pronouncement if there are no signs of life, and the arrest duration is suspected to be > 10 minutes prior initiation of CPR by bystanders or responders.
- Consider Finger Thoracostomy.

Medical Pulseless Arrest

- Resuscitate according to the 2110 Cardiac Arrest protocol on scene (unless unsafe) until one of the following end-points met:
    - Return of spontaneous circulation (ROSC)
    - No ROSC despite 30 minutes of provision of ALS care. If shockable rhythm still present, continue resuscitation and transport to closest emergency department.

- Contact Medical Control for TOR at any point if continuous asystole with no improvement of EtCO2 to >10mmHg for at least 15 minutes in any patient despite adequate CPR with ventilation and no reversible causes have been identified.

- The following patients found pulseless and apneic warrant resuscitation efforts beyond 30 minutes and should be transported:
    - Hypothermic arrest
    - Drowning w/ hypothermia and submersion < 60 min
    - Lightning strike and electrocution
    - Avalanche victim
    - Pregnant patient with estimated gestational age ≥20 weeks regardless of the cause of arrest

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.

Do not terminate resuscitation efforts enroute to hospital when at all avoidable. If determination is made to transport and resuscitate, then efforts should be continued until arrival and transfer of care at receiving facility.

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FIELD PRONOUNCEMENT OF DEATH / TERMINATION OF RESUSCITATION

Documentation

ALS Providers

- Will evaluate patient and situation
- Contact medical control and obtain official Time of Death.
- Notify the appropriate law enforcement agency.
- Ensure scene security until relieved by a law enforcement representative.
- If able, include any bystanders who performed CPR or family members in a short debriefing at the scene.
- In the event contact with medical control is not possible
    - Document the findings as described above as well as the time that a field determination of death as made.
    - Once in contact with medical control, relay this information to them.

In addition to standard PCR documentation, the following should be included

- Condition, position found at time of arrival
- Any DNR orders, if present, along with DNR order number
- Name of primary care physician, if known
- Any circumstances justifying or explaining why CPR was initiated with a DNR order
- Include rhythm strips if resuscitation efforts were made.

MANDATORY REPORTING OF ABUSE

Purpose

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

Definition of Abuse and Reporting Requirements:

- 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.
- An at-risk elder or at-risk adult with intellectual and developmental disability per Colorado Revised Statutes §18-6.5-102, or child who are suspected to be victims of abuse, neglect, or exploitation, as defined in Colorado Revised Statutes §19-3-304, should be reported in a manner consistent with agency guidelines/procedures in a timely manner. Any "suspected" or known incident of abuse, neglect, or exploitation must be reported. If the patient is transported notification should be made to the ED doctor on duty. If the patient is not transported law enforcement should be requested and your concerns reported to the responding officer.

Types of Abuse:

- Types of maltreatment:
  - neglect (majority of cases)
  - physical abuse
  - sexual abuse
  - emotional abuse
  - exploitation (e.g. sex trafficking)

Role of Mandated Reporter:

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

What to report:

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

Additional Information:

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

ON SCENE MEDICAL PROVIDER

PURPOSE

To provide guidelines for prehospital personnel who encounter a physician or other licensed medical provider at the scene of an emergency.

GENERAL PRINCIPLES

- The prehospital provider has a duty to respond to an emergency, initiate treatment, and conduct an assessment of the patient to the extent possible.
- A physician or other licensed provider 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.
- Good patient care should be the focus of any interaction between prehospital care providers and the provider offering assistance.
- EMS should always take actions it determines to the in the best interest of the patient, including transport to the hospital, and the presence of an on-site provider should not deter EMS from its charge.

PROCEDURE

- See table below.

SPECIAL NOTES

- When EMS determines the patient to be critical, EMS will immediately initiate transport to the hospital regardless of what the on-scene provider advises for the patient.
- Upon receipt of a verbal order from the base physician, EMS may allow the on-site provider to render care en route to the hospital per the below guideline.
- Non-physician providers may assist in care, but are not authorized to depart from established protocols.
- Every situation may be different, based on the medical provider, the scene, and the condition of the patient.
- Contact medical control when any question(s) arise.

PROVIDER TYPE	ASSISTANCE LEVEL
Trained personnel but not a physician or advanced practice practitioner (e.g. RN, EMT, WFR, Firefighter, etc.)	May assist EMS personnel within the scope of practice and the scope of PSMC EMS protocols and policies only.
Scene assist only by a licensed physician or an advance practice practitioner (an “APP”). An APP means a nurse practitioner, physician assistant, midwife, CRNA, etc.).	May assist EMS Personnel within the scope of PSMC EMS protocols and policies only.
Physician or APP who assists at the scene and wants to provide care outside of protocols, then is deemed to establish a physician-patient relationship and the provider needs to ride with the patient to the hospital.	Physician/APP may provide care but must consult Medical Control prior to initiating treatment.

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ON SCENE MEDICAL PROVIDER

Hand licensed provider the 'Note to Medical Providers on involvement with EMS Providers" sheet should questions arise.

NOTE TO MEDICAL PROVIDERS ON INVOLVEMENT WITH EMS PROVIDERS

THANK YOU FOR OFFERING YOUR ASSISTANCE.

The EMS personnel at the scene of this emergency operate under standard policies, procedures, and protocols developed by EMS' Medical Director. The drugs carried and procedures allowed are restricted by law and written protocols.

If you are not a physician or are not licensed in the State of Colorado, you may offer your assistance only under the direction of the EMS personnel who abide by established protocols and who are under the direction of medical control physicians.

If you are a physician or other licensed medical provider and after identifying yourself by name as a licensed medical provider in the State of Colorado and providing identification, you may be asked to assist in one of the following manners:

1. Offer your assistance or suggestions, but the prehospital EMS personnel will remain under the direction of their established medical control physician.

2. With the assistance of the EMS prehospital care providers, talk directly to the medical control physician and offer to direct patient care and accompany the patient to the receiving hospital. EMS prehospital care providers are required to obtain an order directly from their medical control physician for this to occur.

_____ _____

Medical Director EMS Chief

PATIENT DETERMINATION "PATIENT OR NO PATIENT"

General Guidelines

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

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

To qualify as a "no patient contact" ALL of the following criteria must be met:

- Is the individual > 18 (or defined as someone who can give consent in (*0050 Consent Protocol*)?
- Does the person have decision making capacity? (Refer to *0060 Determining Decision Making Capacity*)
- Is the person free of signs or symptoms of an acute illness, injury or intoxication based on appearance?
- Was 911 called by someone other than the individual?
- Is the person free of medical complaints?

If the answer to ANY of those questions is NO the individual meets the definition of a PATIENT and a PCR is required

Special considerations:

If you check a vital sign or "touch" the individual in any type of evaluative way that qualifies them automatically as a patient and a PCR must completed

PATIENT NON TRANSPORT OR REFUSAL

GENERAL PRINCIPLES

- When patients with decision making capacity (see 0060 Determining Decision Making Capacity Protocol) refuse or revoke consent, they are exercising their right to terminate the medical relationship with prehospital providers. Patients with decision making capacity must be allowed to refuse all or part of the care offered and/or transport.
- Because an oriented patient may not necessarily possess the ability to process information effectively, patient assessment must also include the patient's decision making capacity.

TERMINATION OF THE MEDICAL RELATIONSHIP

- Non-licensed medical providers (such as emergency medical technicians of all levels working in the prehospital setting under a physician license) do not have the authority to terminate the medical relationship once established. Contacting medical control is required when terminating the medical relationship except for specific circumstances. (See 0030 Base Contact for Physician Consultation)

- Termination of care for any patient is acceptable in the following:
  - Patient is transported to an emergency department, hospital bed, or clinic where a brief report is given to the accepting providers.
  - Patient is a threat to the medics' safety and must be transported by law enforcement for medical clearance.
  - Patient meets criteria for refusal of care.

REFUSAL WHEN TREATMENT/TRANSPORT IS PRUDENT

Lack of Decision Making Capacity

- A patient lacks decision making capacity to refuse if they have an altered mental status so that they:
  - Cannot understand the risk of refusal.
  - Cannot remember questions asked or answers already given.
  - With patients who lack decision making capacity, use law enforcement assistance when necessary. Both EMS providers and law enforcement are protected by the "good faith" rule in the state of Colorado.

- Patients on mental health hold cannot refuse treatment and transport. The original documentation of the mental health hold or the person who placed the hold MUST accompany patients placed on any type of mental health hold.

- An EMS Provider may institute a M 0.5 mental health hold on the behalf of the medical control physician in order to transport a patient who is a threat to himself, manifest or declare suicidal intentions, or lack decision making capacity to refuse care. (See 0600 Mental Health Hold Protocol)

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PATIENT NON TRANSPORT OR REFUSAL

Decision Making Capacity to Refuse

Patients with decision making capacity who have significant illness or injury who adamantly refuse treatment and transport are more troubling. Prehospital personnel must make every reasonable effort to inform the patient of their suspected condition and the implications of their decision. This may include time-consuming deliberation, if necessary.

- In these situations the EMS provider should:
  - Allow the provider who has established the best possible rapport with the patient to communicate with the patient.
  - Explain the nature of the emergency and the risks and benefits of both treatment and refusal; then ask patient to use their own words to explain what they have been told to determine if they understand all three elements.
  - Enlist the help of family members or friends to convince the patient, or recognize when such intervention is not helpful and manage that aspect.
  - Utilize medical control as a resource to help the patient understand the gravity of the illness and need for emergent evaluation
  - Patients with decision making capacity who refuse consent for treatment/transport have the right to make their own medical treatment decisions even if such refusal might result in severe deterioration or death. In this event, the following are required:
    - Repeated attempts to convince the patient in front of witnesses.
    - Consultation with medical control. Have, or attempt to have patient or surrogate speak directly with the base station physician.
    - A reasonable attempt to have the patient sign the refusal of care document after it has been explained to them in front of at least one witness. This must also be signed by a witness, preferably not another medical provider.
    - When the patient refuses to sign the document, the refusal form should be filled out and "refused to sign" written on it, then again witnessed.
    - Make a reasonable attempt to have a family member or friend take responsibility for the patient.
    - Patients in the custody of law enforcement can refuse treatment and transport provided they meet the decision making capacity criteria. In the instance where a patient with decision making capacity refuses treatment/transport, but the law enforcement officer insists on transport – an attempt should be made to convince the patient to go by EMS but if they still adamantly refuse their transport should be accomplished by law enforcement not ambulance.

Refusal Documentation

- Documentation in the prehospital care report must include:
  - Patient name, address, date of birth.
  - Specific information regarding the nature of the incident, assessment of the patient, explanation of the risks of refusal as well as the patient's verbalization of acceptance and understanding of those risks .
  - Documentation of base contact and the advice given by the physician.
  - Attached "AMA / Refusal of Care" signed by patient, if possible.
  - Patient refusals to sign documents must be noted on the form and in the PCR narrative.

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PATIENT NON TRANSPORT OR REFUISAL

Patient consents to transport but refuses specific treatments:

Patients with decision making capacity who refuse consent for treatments (i.e. IV access, medications, spinal precautions, etc) but agree to transport usually present less of an issue to EMS providers because at the very least they are being transported to the hospital. In this event the following are recommended:

- Explain the treatment or procedure and its benefits thoroughly.
- Explain the risks associated with refusing the treatment or procedure.
- Use tactics to convince the patient, such as enlisting family or friends and base station consultation, if necessary.
- Communicate the treatment refusal during the initial patient report from the field and during the bedside report.
- Thoroughly document all of the above in the patient report.

EMS Generated Refusals

- In the absence of a medic safety issue, EMS personnel are expressly NOT allowed to refuse to transport a patient who is requesting to go to the hospital.
- EMS personnel may assist in the decision making process with a patient, but must be clear that transport is always an option.
- EMS personnel may refuse to treat and transport patients for reasons of personal safety. Any unsecured scene, such as, hazardous materials or potentially violent patient may result in the acceptable delay of medical care until which point EMS personnel are no longer at risk of personal injury.

PEDIATRIC/MINOR TRANSPORT

Overview

The following persons may consent to or refuse evaluation, treatment, or transport of a minor:

- Parent
- Grandparent
- Adult (> 18) brother or sister
- Adult (> 18) aunt or uncle
- Representative of an educational institution in which the child is enrolled and who has with them written authorization to consent/refuse from a person having the right to consent/refuse.
- Adult who has actual care, control, or possession of the child and has written authorization with them to consent/refuse from a person having the right to consent/refuse (i.e., daycare camps, soccer moms, carpools, etc.)
- Adult who has actual care, control, or possession of a child under the jurisdiction of a juvenile court
- A peace officer who has lawfully taken custody of a minor, if the peace officer has reasonable grounds to believe the minor needs immediate medical treatment
- A managing or possessory conservator or guardian

A provider may be denied access to minor children by a parent or guardian if there is no obvious immediate life threat to the patient. However, in general, parents or guardians cannot refuse lifesaving therapy for a child based on religious or other grounds.

- If the minor has a life-threatening injury or illness, transport and treat per protocols. If the parent objects to treatment, contact on line medical control immediately and treat to the extent allowable, notify dispatch law enforcement is needed to respond and assist.

A provider is legally obliged to notify Child Protective Services for any reasonable suspicion of child neglect or abuse.

- For children, the Colorado Child Abuse and Neglect Hotline is 1-844-CO-4-KIDS (844-264-5437).

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CARDIAC ALERT

PURPOSE

To identify patients with ST-segment elevation myocardial infarction (STEMI) in the prehospital setting.

INCLUSION CRITERIA:

- Chest discomfort consistent with ACS
- **ECG criteria for STEMI are:**
  - 1 mm ST elevation in 2 or more anatomically contiguous leads
  - Left bundle branch block but meeting Sgarbossa criteria
    - Concordant (same direction as QRS) ST deviations
    - Discordant ST deviation >5 mm
  - **Absence of imposters:**
    - LVH, Ventricular Paced Rhythm, Benign Early Repolarization, Pericarditis, or BBB

EXCLUSION CRITERIA:

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

TRANSPORT DECISIONS:

- All STEMI patients east of the Piedra River should be transported to PSMC for thrombolytic therapy.
- STEMI patients west of the Piedra River should be transported directly to Mercy Hospital.

ACTIONS:

- Treat according to chest pain protocol en route
- Notify PSMC ASAP with ETA and confirm destination – notify of **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 (18G or larger IV to Left (or bilateral) Antecubital is the preferred site for the cardiac catheter lab.)
- Place combination defibrillation/pacing pads on patient (Posterior placement if possible)
- Emergent transport
- If patient does not meet inclusion criteria, or has exclusion criteria, yet clinical scenario and ECG suggests true STEMI, request medical consult with receiving hospital emergency physician.

COMBINING OPIODS AND BENZODIAZEPAMS

PURPOSE:

- The administration of a combination of benzodiazepines and opiates, for the purpose of pain management, anxiolysis and/or muscle relaxation is permitted. Safeguards shall be taken to maximize patient safety.

INDICATIONS

- Pain management, anxiolysis and/or muscle relaxation.

CONTRAINDICATIONS

- Known hypersensitivity or allergy to the medications.

PRECAUTIONS / SIDE EFFECTS

- Safeguards shall be taken to maximize patient safety including, but not limited to, the patient's ability to:

    1. Independently maintain an open airway and normal breathing pattern,
    2. Maintain normal hemodynamics, and
    3. Respond appropriately to physical stimulation and verbal commands.

- To this end, the administration of combination therapy requires appropriate monitoring and care including but not limited to:

    1. IV or IO access,
    2. Continuous waveform capnography,
    3. Pulse oximetry,
    4. ECG monitoring,
    5. Blood pressure monitoring, and
    6. Administration of supplemental oxygen.

DETERMINING ALS TRANSPORT

GENERAL PRINCIPALS

- Certain patients who are transported by EMS require transport by medics with advanced life support (ALS) training. This protocol is to act as a guideline for determining when an ALS medic is needed to attend the patient during transport to the nearest appropriate destination.

- These protocols are designed with the acknowledgement that an ALS medic may not be available at all times and that in rare cases, extenuating circumstances may exist which preclude this guideline. This list is not all-inclusive as there may be calls that do not fit specifically with these criteria. Good judgment by all providers is needed when making the decision regarding the level of care required.

- If the patient has advance directives, such as DNR/DNI orders, available at the scene and transport is requested, the patient may be transported by BLS as long any foreseeable ALS interventions that are against the patient's wishes are noted in the directives.

- Regarding pain medications or anxiolytics: If the patient has taken their prescribed medication prior to calling EMS or if the patient has been given pain medications in the ED prior to transport, the patient may be attended by an EMT if all other criteria allowing for BLS attendant are met.

    - If ALS personnel have administered no more than 100 mcg Fentayl OR up to 1 mg Ativan on scene AND no adverse reaction to the medication has been noted AND and the patient will not be likely to need additional doses en route, AND the patient is hemodynamicly stable, the patient may be attended by an EMT if all other criteria allowing for BLS attendant are met.

- If narcotics and benzodiazepines have been combined, an ALS medic must attend the patient.

- Regarding cardiac monitoring: For thoroughness of the assessment, the ALS medic may place the patient on a cardiac monitor or obtain a 12 lead ECG. If findings of said monitoring are negative and all other criteria allowing for BLS attendant are met, the patient may be attended by a BLS medic.

- EMT may refuse to be primary attendant for the patient, deferring to the ALS medic, if they are uncomfortable with providing care to that particular patient. In such cases, the call will go through the QA process to determine if the refusal reflects a potentially inappropriate decision to have a BLS provider attend the patient or if there is a training issue.

- In all cases that an ALS provider responds and a BLS provider attends, the ALS provider will thoroughly document their assessment findings in the PCR and explain in the narrative the reasoning behind their decision that BLS attending was determined to be appropriate.

- The purpose of this document is provide guidelines to deliver an appropriate level of care to our community to our community, and to allow our BLS providers to gain more experience and practice more fully within their scope and to allow for more effective utilization of our resources.

- If a call has been deemed appropriate for BLS attend on a Medic/EMT ambulance, the EMT is expected to carefully monitor the patient and to notify the ALS provider immediately of changes

- Ultimately, the responsibility for the patient outcome will fall upon the most experienced provider on the ambulance

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DETERMINING ALS TRANSPORT

Findings or symptoms that necessitates ALS transport:

- Respiratory:
  - Increased work of breathing not relieved with oxygen and/or coaching and/or one duo neb or MDI puff
  - Airway obstruction or impending obstruction
  - Hypoventilation – not resolved with antidote administration

- Cardiac:

  - ACS or equivalent symptoms
  - Non reproducible chest pain
  - Tachycardia > 150
  - Hypotension < 90 mmHg
  - Symptomatic Bradycardia

- Neuro:

  - Altered mental status or unresponsive if the cause is unable to be determined
  - Seizure: Status seizure, actively seizing, new onset seizure (no prior history)
  - Stroke like symptoms that are persistent with the likelihood that advanced airway management will be necessary

- Bleeding that may require the administration of TXA
- Significant environmental exposure (heat, cold, burns, electric, near drowning)
- Symptomatic overdose
- Patients requiring sedation or pain control during transport.
- Toxic or hazardous exposure
- Patients meeting hospital activation criteria for STEMI, Sepsis or level 1 trauma activation (under the above conditions a BLS provider MAY attend on some level 2 trauma and or stroke alerts)
- Imminent delivery

STANDBY/ FIRE SCENE REHABILITATION

PURPOSE:

- To provide evaluation and care to firefighters involved in a strenuous incident or training.

GENERAL PRICIPALS:

- Rehabilitation and medical evaluation will be provided when a med unit is requested by the IC.
- EMS will be responsible for the evaluation based upon this protocol and Pagosa Fire Protection SOPs.

PROCEDURE:

- Response will be non-emergent unless requested by command or victims requiring EMS are reported.
- Park vehicle in safe location that will provide easy egress if a patient needs transport. It is imperative not to get blocked in by responding fire apparatus. The location should be close to the rehydration portion of rehab and ideally near the air bottle exchange station.
- Contact the Incident Commander, face to face if possible, and determine if contact will be IC directly or the Rehab Officer.
- EMS personnel are to maintain a 50' distance from any structure fire or hazardous environment.
- Firefighters will be evaluated after (2) 30 min air bottles have been depleted or 40 min of strenuous activity.
- Any Firefighter who is in obvious distress or is sent by command for an evaluation will have a detailed medical evaluation and a PCR will be completed for this patient.
- Rehab Procedure
  - They will be evaluated for pulse, BP, and temperature. This information will be recorded on the PFPD rehabilitation report (sample below).
  - Firefighters will remain in rehab a minimum of 15 min. unless they meet the criteria for release upon entry to rehab.
  - Any firefighter that has a complaint upon entry into rehab will receive a full evaluation and a PCR will be completed for this patient.
  - Any firefighter that does not meet the criteria for release after two consecutive 15 min periods shall be reported to the IC or Rehab Officer and should consider transport to the ED.
  - IC or Rehab Officer shall be informed of any personnel whose condition may pose a threat to themselves or their fellow firefighters.
- EMS unit will remain on scene until released by IC or Rehab Officer. If the Unit must leave to cover a 911 call, the IC of Rehab officer shall be informed of the departure

CRITERA FOR RELEASE FROM REHAB

Pulse	BP	Respirations	Temperature
< 120/min	90/60>X<160/100	<24/min	<100.6

REHABILATION REPORT

Name	Times		B/P	Pulse	Resp	Temp	Eval by	complaints
	In							
	Out							
	In							
	Out							

HANDCUFFED PATIENT

PURPOSE

- The patient is being transported after being taken into police custody and has already been placed in handcuffs by a police officer.

PRECAUTIONS / COMPLICATIONS

- Any attempt to restrain a patient involves risks to the patient and the prehospital provider. Efforts to restrain a patient should only be done with adequate assistance present.
- At no time should the patient who does not require spinal motion restriction be placed in a prone position for a prolonged time at the scene or during transport to the hospital.
- Ensure that patient has been searched for weapons.

GENERAL PRINCIPALS

If the patient is being restrained for agitated/combative behavior vs being in police custody. Pt optimally should be chemically sedated per "2030 Agitated Patient Protocol" for provider and patient safety.

For the patient who does not require spinal immobilization

- Maintain restraint via the handcuffs.
- Secure the patient to the gurney in a position of comfort, utilize seat belts.
- Treatment and transport should be done with the patient remaining in the handcuffs.
- Request that the officer stay with the patient and ride in the ambulance during transport. If an officer is unable to ride during transport, obtain handcuff key from officer in the event the handcuffs need to be removed for patient care/intervention. This should only be done in extreme situations (i.e. patient arrest, or extremis). Ultimately, EMS is not responsible for the hold on this patient. The first priority is the safety of the EMS crew. If the patient cannot be controlled or there is a risk of harm to providers during transport; do not transport until adequate assistance from law enforcement is present.

For the patient who requires transport with spinal immobilization

- Consider chemical restraint early to avoid further injury to the patient.
- Ensure that you have adequate assistance available to maintain restraint of the patient.
- Secure the patient's cervical spine with a cervical collar if indicated.
- Assign one individual to support the patient's head.
- Bring the stretcher, with backboard or scoop if indicated, to the patient.
- Secure each arm and both legs with restraint portion of the quick release Velcro restraints (located on the stretcher) prior to having the officer remove the handcuffs.
- Roll the patient onto a backboard or scoop.
- Place the stretcher next to the patient and lift the patient onto the stretcher.
- Secure one arm of the patient to the scoop or backboard with handcuffs. If further restraint is quick release Velcro restraints to restrain other extremities – these can be secured to backboard if necessary.

MEDICAL HELICOPTER ACTIVATION

PURPOSE

- To provide a standard for the activation of medical helicopter resources providing emergency medical care in the prehospital setting within Pagosa Springs Medical Center EMS's response area.

GENERAL PRINCIPLES

When considering HEMS activation, evaluation of the following items can help determine appropriate HEMS activation:

- Will ground transport take longer than the time it would take the helicopter to do preflight, fly here, land, shut down (FFL does not do "hot loads"), transfer the patient into the helicopter, restart the motor and the return flight?
    - Using Flight for Life from Durango (the closest HEMS to us) that time approaches 2 hours total minimum for them to get back to Durango – Durango is only a level 3 trauma center – Would the patient be better served by bringing them to PSMC for stabilization and transfer out to a level one center?
- From a clinical standpoint, does the patient require minimal transport time outside of the hospital or critical care setting?
- Are there time critical evaluations or treatments for the patient which are required but unavailable at PSMC?
- Are ground units able to access the patient for timely transport?
- Are landing zones available near the scene?
- Can ground-based personnel provide the patient's care requirements, or does the patient require a higher level of care only available on a HEMS unit?
- Is ground-based critical care transport a viable alternative to HEMS transportation?

It must be kept in mind that recommendations for HEMS activation are not intended to replace clinical judgment, nor are they intended to be the sole determinates as to which patients should be transported by HEMS units.

PROCEDURE

- The highest level EMS provider on-scene or the Incident Commander should make the decision to mobilize a medical helicopter.
- Decision may be made to launch medical helicopter prior to arrival on scene. Reliable information from bystanders or first responders indicating the possible need for helicopter resources may be deemed sufficient for activation without delay.
- Patients requiring critical interventions should be provided those interventions in the most expeditious manner possible.

Dispatch of Air Ambulance

- The closest available Air Ambulance will be coordinated via dispatch determined by shortest time of arrival.
- EMS providers may assist in coordinating transport, but are not to bypass dispatch nor delay care of critical patients while trying to coordinate transport

Cancellation of Air Ambulance

- Only the on-scene Incident Commander, *in collaboration* with the on-scene medical authority, may cancel a medical helicopter en route. Even if the helicopter is en route or has landed, this does not mean the patient should go by air. If they do not meet the above criteria, they should be transported by ground so as to make the helicopter available for more emergent needs.
- Medical Control may be used as a resource to assist with cancellation decisions.
- Medical helicopter services retain final authority to cancel the mission for any reason, such as weather or other safety concerns.

INTERFACILITY TRANSFER LEVEL OF CARE CONSIDERATIONS

LEVEL OF CARE

	BLS	ALS	CCT
Foley catheter	X		
O2	X		
IV Lock	X		
IV with NS, D5W,LR – no Meds	X		
Tracheostomy management - Suction	X		
CPAP – Non-ventilator	X		
Blood products		X	
Cardiac monitoring		X	
Chest Tube Maintenance		X	
Infusion pump – Paramedic approved meds		X	
TPN nutrition/ Vitamins		X	
Ventilator – CPAP, BiPAP, intubated and simple		X	
Ventilator – May need complex/frequent adjustment in parameters			X
Infusion Pump – CCT approved meds			X

CRITICAL CARE VS PARAMEDIC (ALS) MEDICATIONS

If a medication being infused is not listed on this form and not in the 911 scope of EMS, the infusion MAY NOT be transported by our service. Alternative arrangements will need to be made (i.e. use a substituted medication, air transport, etc.). Please contact the Admin on call if there are any questions at 970-507-3841.

CRITICAL CARE MEDICATIONS

Acetylcysteine (Mucomyst)	Labetalol (Normodyne)	Phenytoin (Dilantin)
Bilvalirudin (Angiomax)	Levetiracetam (Keppra)	Propofol (Diprovan)
Fosphenytoin (Cerebrex)	Metoprolol (Lopressor)	tPA infusion

PARAMEDIC (ALS) MEDICATIONS

Antibiotic Infusion - ALL	Heparin	Nitroglycerin Infusion
Antiviral Infusion - ALL	Fentanyl, Morphine, Dilaudid	Norepinephrine (levophed)
Blood products - ALL	Insulin	Octreotide (Sandostatin)
Amiodarone (Cordarone)	Ketamine infusion	Oxytocin (Pitocin)
Calcium infusions	Lidocaine	Pantoprazole (Protonix)
Diltiazem (Cardizem)	Magnesium Sulfate infusion	PCC (Kcentra)
Dobutamine (Dobutrex)	Mannitol	Phenylephrine (Neosynephrine)
Dopamine (Inotropin)	Midazolam (Versed)	Potassium Chloride Infusion
Epinephrine infusion	Narcan Infusion	Sodium Bicarbonate Infusion
Esmolol	Nicardipine (Caredene)	Tranexamic Acid (TXA)

INDWELLING CATHETERS

INDICATIONS

- To obtain rapid venous access for the critical patient when peripheral access cannot be obtained.
- For use after failed IV or IO access; unless patient or patient's family insist on the direct usage of Vascular Access Device (VAD)

PRECAUTIONS / COMPLICATIONS*:*

- Obtain information and assistance from family members or home health professionals who are familiar with the device.
- Assure placement and patency of the VAD prior to infusing any fluids or medications.
- Flush the catheter completely with sterile normal saline.
- Use aseptic technique.
- Patients with VADs are very susceptible to site infection or sepsis. Use sterile techniques at all times.
- Sluggish flow or no flow may indicate a thrombosis. If a thrombosis is suspected, do not utilize the lumen.
- Rarely, a catheter will migrate. If a catheter migration is suspected, do not use the VAD and treat the patient according to symptoms. The symptoms may include the following:
  - Burning with infusion
  - Site bleeding
  - Shortness of breath
  - Chest pain
  - Tachycardia and/or
  - Hypotension
- Catheters are durable but may leak or be torn. Extravasation of fluids or medications occurs and may cause burning and tissue damage. Clamp the catheter and do not use.
- Air embolism may occur if the VAD is not clamped in between infusions. Avoid this by properly clamping the catheter and preventing air from entering the system.

TECHNIQUE

Special Information Needed:

- Obtain pertinent medical history if possible.
- Obtain any information possible regarding the type of VAD, number of lumens, purpose of the VAD, etc.
- Contact medical control for advice on any infusion pumps or drip medications.

Central Venous Catheters or PICC Lines:

- Identify the location and type of VAD (i.e. central venous catheter, peripheral inserted central catheter).
- Utilize knowledgeable family members, significant others or home nurse if available.
- Clamp the VAD closed to prevent air embolus.
- If multiple lumen, identify the lumen to be used.
- Utilize aseptic technique.
- Briskly wipe the injection cap with an alcohol and/or povidone-iodine pad.
- Attach syringe, needle may be required, to hub of lumen to be used. Aspirate slowly for a positive blood return. Obtain blood samples if necessary. Then flush the line with saline.
- Attach syringe or drip set, needle may be required, to hub of lumen to be used and infuse medications or fluids.

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INDEWLLING CATHETERS

- Secure the IV tubing.
- Reassess the infusion site.
- Reassess patient condition.

Implanted Ports:

- Identify the location and type of VAD (e.g. implanted port).
- Utilize knowledgeable family members, significant others or home nurse if available.
- Carefully palpate the location of the implanted port.
- If multiple ports, identify the port to be used.
- Using sterile technique, prep the site with alcohol and/or povidone-iodine pad. Wipe from the center outward three times in a circular motion.
- Using a sterile gloved hand, press the skin firmly around the edges of the port.
- Using a syringe filled with solution, insert the needle perpendicular to the skin.
- Aspirate slowly for blood return, then flush the port prior to infusion. When aspirating blood from a VAD, use a syringe that is 10cc or less to avoid complications.
- Secure the IV tubing (attached to the needle left in the port). .
- Reassess the infusion site.
- Reassess the patient.

PROCEDURE	EMT-IV	AEMT	EMT I/99	EMTP	PCC
PICC Lines	--	--	**SO**	**SO**	**SO**
Implanted Ports (not including PICC)	--	--	--	**VO**	**VO**

MASS CASUALTY INCIDENTS

PURPOSE

- To provide a guide for responders to a multiple casualty incident.
- To provide a consistent standardized approach to an MCI incident.

GENERAL PRICIPALS

- MCI: An incident where the combination of numbers and types of injuries that go beyond the capability of an entity's normal response.
- Refer to SWRETAC Field Operational Guide (FOG) for supportive instructions.
- PSMC EMS will utilize the ICS system including its terminology
- The overall goal is to do the most good with the available resources
- The first 5 minutes of the MCIs field management will set the tone for its outcome
- Most incidents will be level 4 MCI under the SWRETAC FOG Guidelines.
- Scene Safety is everyone's priority. Staff assigned to an MCI should recognize that safety hazards will exist, and staff should avoid situations that could cause harm
- Incidents may be much larger than an EMS resource is capable of managing, request additional resources as necessary
- All incidents types will be initiated by the local EMS, FIRE, LEO, public Health departments Type 2 and Type 1 incidents will be transitioned over to a regional incidents command team or a federal incident command team.
- Always communicate with your partner

SWRETAC MCI Levels

MCI Type 4- Single EMS agency response w/multiple victims and additional resources needed (4-10 victims)
MCI Type 3-EMS agency response w/multiple victims and additional mutual aid resources needed (11-25 victims)
MCI Type 2- Regional response-multiple agency response (26-100 Victims)
MCI Type 1- State/Federal involvement (100 or more victims)

PROCEDURE

IF first agency on scene:

- Once on scene establish command and communicate with dispatch
  - Name of Street/Location + command examples "establishing 160 command" or "establishing Hot Springs Command"
- Perform a Scene Size Up 360 (type of incident, possible # of patients, severity level of injuries, potential scene safety problems)
- Send information (contact dispatch and communicate size up)
- Request additional resources as needed,
  - Communicate ingress and egress routes (if applicable)
- Once Pagosa Fire or other responding agency arrives on scene, transfer command and communicate scene, safety concerns and resource information that is known to the Incident Commander who will assume command functions

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MASS CASUALTY INCIDENTS

If First Medical Resource on scene:

- Designate Medical Branch Director (FOG pg. 10)
    - IN most Type 4 Incidents the first responding unit is expected to assume the Medical Branch director role **and** directly participate in Triage, Treatment and Transport functions
        - First ambulance in – is the last ambulance out
    - The Medical Branch Director is responsible for all medical functions occurring on an incident. They report to the Incident Commander while assigned on scene.
    - The primary function of the Medical Branch Director is to coordinate all medical care within the incident.
    - Communicate early and often with the Incident Commander and hospitals affected
    - EMS units should identify who will assume the Medical Branch Director position on each ambulance prior to the unit arriving at the scene of an MCI incident.

- **Medical Branch Directors Responsibilities detail:**

Assess

- Perform a 360 degree scene size up and physically walk around the scene
- Assess Mechanism of injury/illness
- Assess for Hazards and possible toxicology threat to you or your patients
- Perform initial triage. This should be completed within the first few minutes of arriving on scene.

Communication

- EMS 1 is the primary medical channel for incidents within our service area provide status updates of the incident often
- EMS 2 or cell phone utilized for communication with PSMC related to sensitive patient information 970-731-3705
- Establish other communication channels if needed
- Communicate and coordinate with the Incident Commander. Communication should include status of medical branch, incoming resources and any additional resources that are needed. Consider requesting additional resources to establish landing zones and landing teams
- Communicate and coordinate with local hospitals. Communication should be established immediately after the scene triage is complete and updated often. This key communication activates PSMC and other regional hospitals emergency operation plans, resulting in additional resources, including trauma teams, surg teams, bed counts and specialty physicians etc..
- Request additional medical unit resources.
- Request MCI Trailer.
    - Trailer code: 3766
- Request air resources if needed.

(CONTINUED)

MASS CASUALTY INCIDENTS

Organize Patient Care

- Utilizing triage, available resources and scene information establish Treatment and Transport areas. The best location to place a treatment area is near a resource that has medical supplies, able to block wind, provide heat and has appropriate lighting. In most circumstances this will be in or near an ambulance.
- Assign and organize all medical branch resources, including unit leaders (if applicable). Unit leaders are only established on large scale incidents (Type 3 or larger scale incident.)
- In most circumstances, assigning an ambulance unit to a specific patient is the most efficient way to organize the scene

Accountability

- Assure all persons, units and equipment assigned to the medical branch are always accounted for
- Track all patients including, basic demographics and/or injuries/illness, triage colors, units assigned and patient destination

If Additional Medical Units on Scene:

- Additional medical units report to the Medical Branch Director for assignment. If the unit is responding to an established large scale incident they may be directed to report to the staging area or an incident command post where they will be assigned once they arrive to those areas.
- Assure communication with the Medical Branch Director and/or the Unit leader as assigned. This is most likely going to be face-to-face communication but could include radio frequencies programed into the company 800mghz radios
- Units may be assigned to a Triage, Treatment or Transport Group or they may be assigned a specific patient in which the triage, treatment and transport will need to be completed by the unit. Assignment of task is performed by the Medical Branch Director

  - Triage Task/Group: (FOG pg. 13)
    - Initiate START/Jump START triage. Start where you are and keep moving – **DO NOT PROVIDE TREATMENT**. (FOG pg. 6-7)
    - Identify a "pediatric" patient based on appearance: if the patient appears to be less than 12 years old, treat them as a pediatric patient.
    - Assign an individual to secure GREENS (walking wounded) to a designated area.
    - Attach triage tags if 4 or more patients are involved and ensure the tag is attached to the patient, not the clothing
    - Begin transfer of remaining patients to Treatment Group in the following order: REDS and then YELLOWS,
    - Patients with a triage color of BLACK should remain in place for the investigation or until cleared through incident command
    - Communicate total numbers of each color triaged.

(CONTINUED)

MASS CASUALTY INCIDENTS

- Treatment Task/Group: (FOG pg. 16)
  - Establish a Treatment unit Supervisor (if needed)
  - Organize treatment areas such that RED and YELLOW areas are near each other and are separated from GREEN and BLACK areas.
  - Re-triage patients upon arrival at treatment area, keeping in mind that YELLOW can decompensate to RED rapidly.
  - Treat patients as necessary and provide ongoing assessment as time allows. Remember to do the most good with the resources you have, which will likely only include the contents of an ambulance and your medical kit.
    - Primary focus-ABC's of all patients
    - Secondary- splinting and pain management.
  - **Track all patients with triage tag # and acuity if over 4 patients.**
- Transport Task/Group: (FOG pg. 17)
  - Establish transport unit supervisor (if needed)
  - Ensure communications link is established with designated ED.
  - Establish ambulance staging areas and landing zones.
  - Transport patients in order of priority to appropriate receiving facilities. (Try to keep families together if possible.)
  - **Track all patients with triage tag #, acuity, and location if over four patients**.

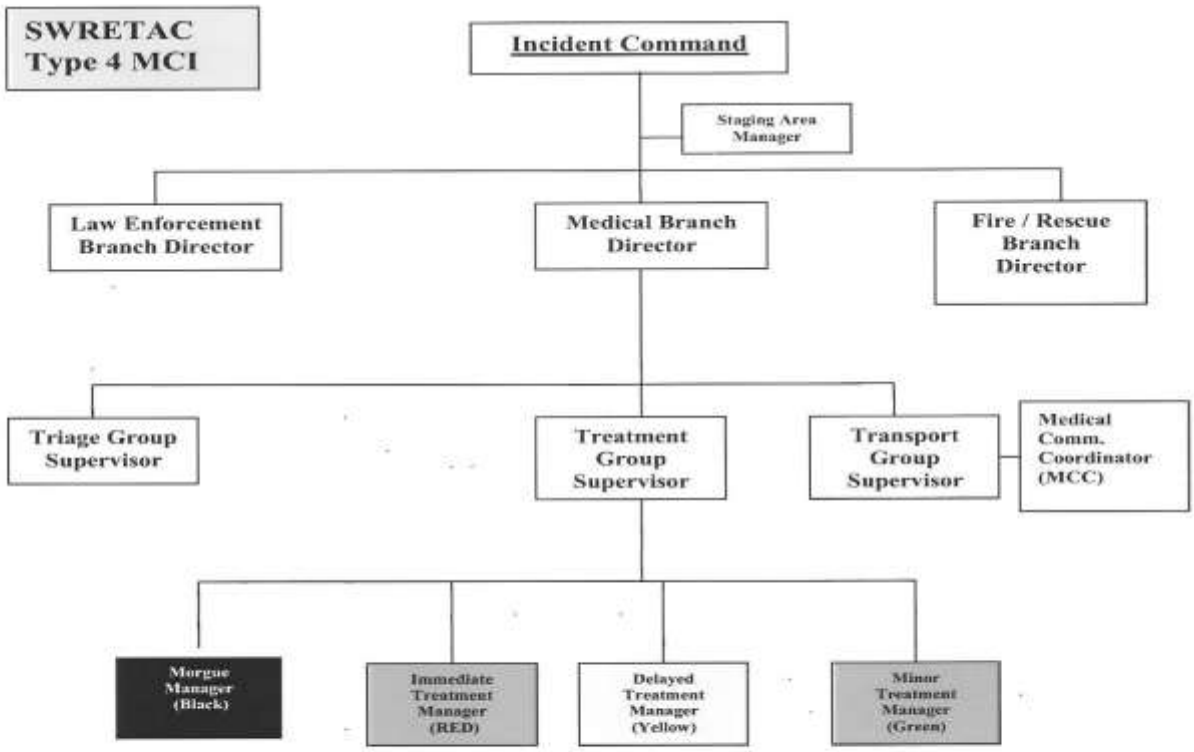
SPECIAL NOTES

- Notify EMS Admin on call immediately for any MCI's. This is usually best performed by a crew member not assigned to the incident
- Activate EMS Call Tree; if directed by admin on call

(CONTINUED)

MASS CASUALTY INCIDENTS

SWRETAC REGIONAL MCI TYPES
(1 highest - 4 lowest)



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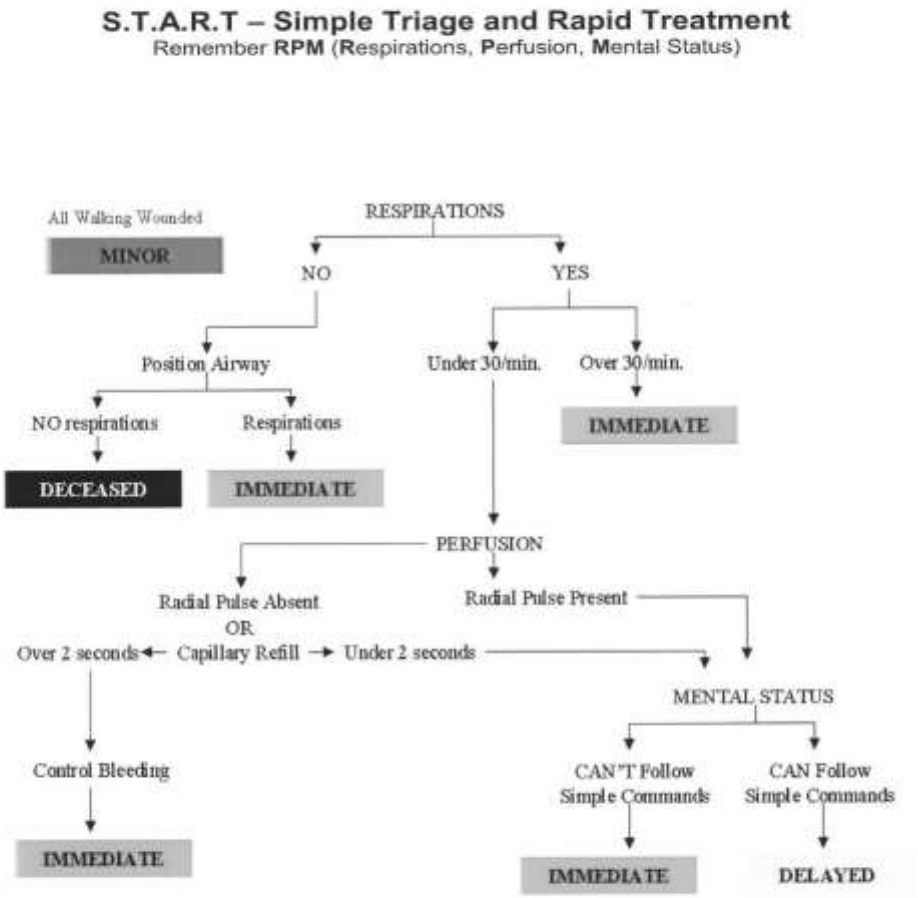
MASS CASUALTY INCIDENTS



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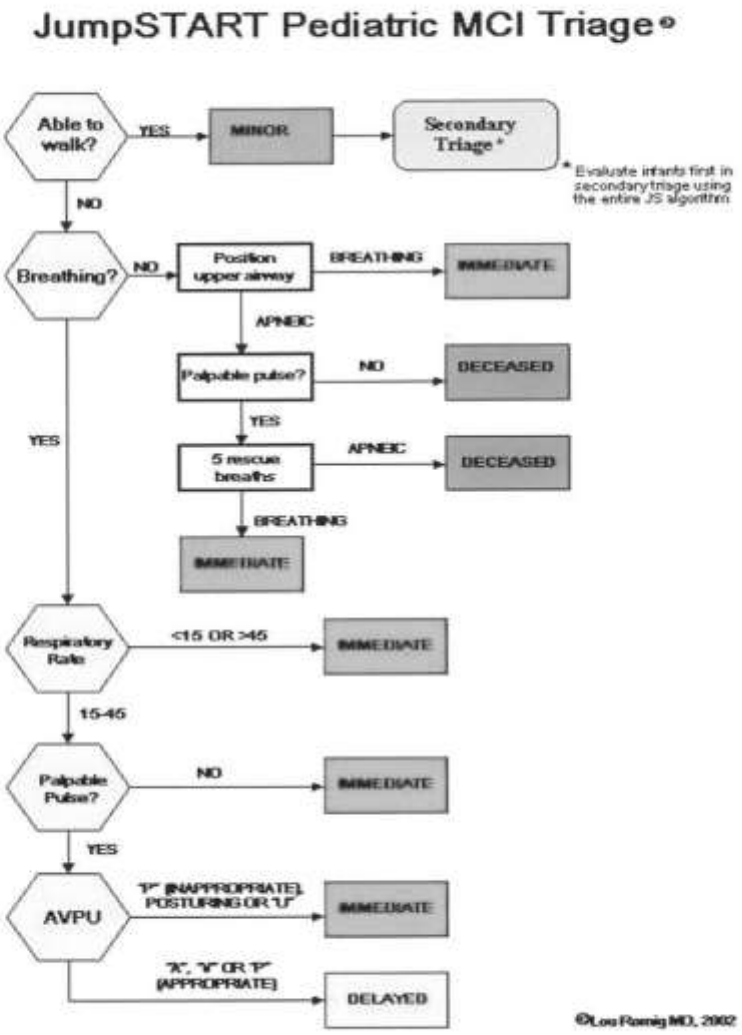

MEDICATION ADMINISTRATION

TECHNIQUE:

Determine if the patient has any known medication allergies if possible

Medication selection

- Six Rights:
  - right patient
  - right medication
  - right dose
  - right route
  - right time
  - right documentation
- check drug for clarity and expiration date

Drawing Medication from Container

- Use syringe just large enough to hold appropriate quantity of medication
- Attach appropriate needle to syringe.
  - Multi or single dose vial
    - Break cap off of vial
    - Wipe with an alcohol pad
    - Invert vial and insert needle into rubber stopper
    - Draw medication
    - Push air out of syringe
- Pre-filled syringe
  - Push air out of syringe
  - In rare circumstances needle may need to be attached to administer medication

Intravenous / Intraosseous Administration

- Use needle appropriate for viscosity of fluid injected. Glucose requires larger gauge needle; for most other medications, smaller is appropriate.
- Wipe IV tubing leur lock port with alcohol.
- Attach syringe to leur lock port
- Pinch IV tubing closed between bag and needle
  - May not be necessary or desirable if you wish to dilute or give drug slowly.
- Inject at a rate appropriate for medication.
- Detach syringe from port.
- Record medication given, dose, amount, time and patient response.
- Give small saline fluid flush to get the drug from the tubing to the patient.
  - IO may require flush with a syringe or a pressure infuser on the IV bag.

Intramuscular Technique

- Prep area of skin with alcohol or Betadine wipe.
- Without touching site, apply slight traction to the skin. This allows the skin to slide back over the needle hole and keeps the medication from seeping out.
- Inject, with appropriate needle size and diameter, into desired muscular site (deltoid, rectus femoris, or vastus lateralis) perpendicular to the skin.
- Inject medication slowly into muscular site.
- Withdraw needle and observe for any bleeding or swelling.
- Apply sterile dressing to injection site.
- Record medication given, dose, amount, time and patient response.

(CONTINUED)

MEDICATION ADMINISTRATION

Oxygen Powered Nebulizer

- Use safety nebulizer mask.
- Unscrew chamber from the bottom of the nebulizer
- Tear top off of plastic ampule and squeeze medication into chamber
- Attach to O2 tubing and set at 6-8 L/min (sufficient to produce good vaporization).
- Administer until solution is gone from chamber.
- Record medication given, dose, amount, time and patient response.

Intranasal

- Fill atomizer syringe with the indicated dose.
- Attach atomizer
- Assure that patient's nare is clear
- Place atomizer in a patent nare
- Quickly inject while holding atomizer in nare
- Volumes greater than 0.5mL will often drain into the oropharynx. If possible, use both nares and divide the dose if the volume exceeds 0.5mL

PRECAUTIONS / COMPLICATIONS

- Local extravasation during IV medication injection, particularly with dextrose or vasopressors, may cause tissue necrosis. Watch carefully and be ready to stop injection immediately.
- Certain medications can be administered via one route only, others via several. If you are uncertain about the drug you are giving; contact medical control
- Allergic and anaphylactic reactions occur more rapidly with IV injections, but may occur with medication administered by any route.
- Too rapid IV injection can cause untoward side effects (except for adenosine); for example, epinephrine can cause asystole or severe hypertension.
- IM and SQ routes are unpredictable:
  - Medications are absorbed erratically via these routes and may not be absorbed at all if the patient is seriously ill and/or has severely vasoconstriction.
  - Later treatment may be affected because of slow release and late effects of medication given hours before.
- Multi dose vials are only sterile if each person uses sterile technique. Vials should be considered multi dose, but single patient use.

MENTAL HEALTH HOLD (M-0.5 HOLD)

PURPOSE

- To facilitate treatment and transport for behavioral health patients who are in need of acute care.
- To ensure both patient and crew safety.

CHANGES

An M1 hold is a 72 hour involuntary hold which by statue (27-65-105) may only be initiated by police officers, people licensed to practice medicine, or a few others (e.g. trained mental health professionals). However, paramedics and EMT's are NOT qualified to initiate an M1 hold unilaterally.

An M-0.5 hold as established by statute (27-65-105(1)(a)(1.5)) is an involuntary transportation hold. It is intended to provide an initial intervening step for an individual suffering from a mental health crisis who will not accept transport voluntarily and who does not clearly meet the standards for an M1 hold. Under this statute, involuntary transport can be initiated to a facility that will then screen for the need for a 72 hour hold or an appropriate Emergency Medical facility. Similar to an M-1 hold, an M-0.5 hold may only be initiated by police officers, people licensed to practice medicine, or a few others (e.g. trained mental health professionals). However, paramedics and EMT's are NOT qualified to initiate an M-0.5 hold unilaterally.

GENERAL PRINCIPALS

For our purposes, we will **only** ever be requesting an M-0.5 hold. This allows us to involuntarily transport the patient for immediate evaluation by a licensed professional to see if they meet the criteria for an M1 hold.

Three possible outcomes from an M-0.5 hold:

- The individual agrees to receive mental health services voluntarily.
- If the individual refuses voluntary services and criteria are met, a 72 hour (M1) hold may be placed by a qualified professional at the facility.
- If the individual refuses voluntary services and does not meet criteria, the individual is free to leave the facility.

INDICATIONS:

If a patient appears to have a mental health disorder and, as a result of such mental health disorder, is in need of immediate screening for treatment in order to prevent physical or psychiatric harm to others or to himself or herself, according to C.R.S. 27-65-105(1)(a)(I.5) they should be involuntarily transported to the ED for immediate screening, with approval by medical control as soon as possible.

IMPORTANT DEFINITIONS:

***Danger to Self* –** The individual poses a substantial risk of physical harm to self as manifested by evidence of recent threats of or attempts at suicide or serious bodily harm to self.

***Danger to Others* –** The individual poses a substantial risk of physical harm to another person or persons, as manifested by evidence of recent homicidal or other violent behavior by the individual, or by evidence that others are placed in reasonable fear of violent behavior and serious physical harm to them, as evidenced by a recent overt act, attempt, or threat to do serious physical harm by the individual.

(CONTINUED)

MENTAL HEALTH HOLD (M-0.5 HOLD)

***Gravely Disabled* –** A condition in which a person, as a result of a mental health disorder, is incapable of making informed decisions about or providing for his or her essential needs without significant supervision and assistance from other people. As a result of being incapable of making these informed decisions, a person who is gravely disabled is at risk of substantial bodily harm, dangerous worsening of any concomitant serious physical illness, significant psychiatric deterioration, or mismanagement of his or her essential needs that could result in substantial bodily harm. A person of any age can be "gravely disabled" but such a term does not include a person whose decision making capabilities are limited solely by his or her developmental disability.

***Imminent* –** applies to the proximity in time of dangerousness, such that a danger exists which could reasonably be expected to cause death or serious physical harm immediately. More specifically, the term "imminent" applies to a determination of whether the danger to others or self is CURRENT; it does not apply to how soon in time a specific dangerous act may be undertaken.

WHO MAY INITIATE:

- The medic may initiate an M-0.5 transportation hold **ONLY** with the permission and online contact with the receiving physician. If medical control and law enforcement are unavailable, patient consent rules apply; the patient can only be transported if there is voluntary consent and there is no threat to the provider's safety.
- The law allows only physicians, trained nurses, mental health professionals and law enforcement officers to place mental health holds (including M-0.5 holds).

PROCEDURE:

- The least restrictive means of providing care should always be used; voluntary services should be pursued before involuntary services.
- If there is any acute threat (e.g. weapons involved), crews will stay away from the scene until cleared to enter by law enforcement.
- If a patient displays an imminent threat to harm themselves or others (e.g. gun to the head, waving a knife, etc.) after EMS arrival, EMS is to leave the scene and stage in the area until the threat is resolved. This needs to be immediately communicated to dispatch.
- Sedate and/or restrain only as necessary (See: Agitated Patient and Restraint Protocols). Use assistance of law enforcement if the patient is combative; **do not put yourself at risk.**
- Call medical control for the physician to place the patient on a transportation hold.
- Transport to the nearest Emergency Department.
- If there is a situation where EMS believes someone needs to be brought to the ED and medical control can't be contacted by radio or telephone, involuntary transport can be initiated and the transport can be approved by medical control once radio contact can be initiated.

POLICE ASSISTANCE AND SCENE SAFETY:

Per their policies and procedures, PD are expected to establish scene safety. If no crime has been committed and they determine the scene is safe, they will clear EMS to enter the scene. It is incumbent on the EMS crew to maintain awareness of scene safety and adapt as needed. The EMS crew is to retreat to a safe staging location at any time they deem the scene unsafe. This retreat MUST be communicated with dispatch and clearly documented in the PCR.

(CONTINUED)

MENTAL HEALTH HOLD (M-0.5 HOLD)

INITIAL CONTACT/COMMUNICATIONS WITH LAW ENFORCEMENT:

If there is not a potential imminent life threat to the patient, EMS staff will make initial contact with law enforcement on scene to ensure appropriate information gathering and establishment of common picture/situational awareness. Once the common picture and initial communications are established, EMS shall proceed with patient contact. EMS staff shall than follow up with Law enforcement regarding any specific medical concerns (e.g. hypoglycemia, head injury/neuro insult, acute ingestion of drugs/alcohol, postictal state after a seizure, etc). If the primary concern is behavior/psych and underlying medical issues are not suspected or found, this should be communicated with law enforcement and a plan for how law enforcement will support EMS should be discussed. It should be expected that law enforcement will not use force if there is no imminent threat.

DOCUMENTATION:

EMS staff shall document thoroughly and completely. Communication with law enforcement will be documented in the PCR, including the name of the specific officer to whom the communication was relayed, as well as the concerns communicated and the outcome of that communication. Additional items that need to be documented include the patient's response to the following questions:

- Do you know who we are? (Is the patient able to identify EMS?)
- Do you know why we are here? (Generally and/or specifically – does the person understand that EMS was called for emergency medical attention in general, and/or do they know the specific reason?)
- Do you require medical assistance/attention?

If a hold is initiated by law enforcement they MUST provide the original hold and original rights documentation for transport to the hospital, or follow EMS to the hospital to provide said paperwork to the physician on duty.

PROCEDURE	EMT IV	EMT I/99	EMT P	CCP
Placement of a patient on a transportation hold as indicated	**VO**	**VO**	**VO**	**VO**

SPECIAL CONSIDERATIONS:

- In terms of legal consequences, abandonment is much more serious and a much bigger threat than bringing someone to the ED against his/her will when EMS believes he/she needs help.
- To assist with screening for suicidal ideation, see the screening tool on the next page.

(CONTINUED)

MENTAL HEALTH HOLD (M-0.5 HOLD)

	Past 1 month	
1) Have you wished you were dead or wished you could go to sleep and not wake up?		
2) Have you actually had any thoughts about killing yourself?		
If **YES** to 2, answer questions 3,4,5 and 6 If **NO** to 2, go directly to question 6		
3) Have you thought about how you might do this?		
4) Have you had any intention of acting on these thoughts of killing yourself, as opposed to you have the thoughts but you definitely wouldn't act on them ?	**HIGH RISK**	
5) Have you started to work out or worked out the details of how to kill yourself? Did you intend to carry out this plan?	**HIGH RISK**	
Always Ask Question 6	Lifetime	Past 3 months
6) Have you done anything, started to do anything, or prepared to do anything to end your life ? • *Examples: Collected pills, obtained a gun, gave away valuables, wrote a will or suicide note, held a gun but changed your mind, cut yourself, tried to hang yourself etc.*		**HIGH RISK**

Any **YES** indicates that someone should seek behavioral healthcare.
However, if the answer to **4,5** or **6** is **YES** **HIGH RISK FOR SUICIDE**

National Suicide prevention Lifeline: 1-800-273-TALK(8255)
Colorado Crisis Services: 1-844-493-8255
Axis crisis line: 970-247-5245

RESPONSE LEVEL GUIDELINE

Pagosa Springs Medical Center EMS has committed to provide the appropriate level resources to all 911 calls.

The following chart is meant to be an aid for determining the response level when BLS units are in service and available. This chart is not all inclusive, and should a question arise, the ultimate decision should lie with the shift lead, on duty Captain if the shift is not available, or the most senior paramedic at the station of none of the other options are viable.

In ALL cases that a BLS unit responds they have the obligation to call for an ALS unit at any time during the call if they feel it warranted. ALS car will respond to requests from BLS units if there is a unit available.

Just because an ALS unit is required to respond to the call, BLS providers may still be the attendant, provided the criteria for BLS attend are met – see determining ALS transport protocol.

BLS	ALS
Calls dispatched as non-emergent through EMD that don't meet other ALS response criteria	ALL calls dispatched as emergent response through EMD regardless of the nature
Motor vehicle accidents where no injuries are reported or initial call comes in as minor injuries	Motor vehicle accidents with indication of significant mechanism
Minor trauma not likely to require pain meds (assaults, isolated extremity injury, etc.)	Major bleeding
Non-recurring seizure	Patients likely to require pain management or sedation
Nausea/vomiting/diarrhea with no other complaints	Chest Pain or Palpations
Chronic Pain	Difficulty breathing for any reason
Public Assist/Lift Assist with no injuries reported	Recurring or persistent seizure
Psych calls where no indication of violence or agitation has been reported	Loss of consciousness for any reason
LE requests for evaluation	Altered mentation/unresponsive
	Overdose or toxic/hazardous exposure
	CVA/focal neurologic changes including weakness
	Significant environmental exposure
	Active labor

RESTRAINTS

APPROACH

It is the policy of this agency that patient care is delivered with a priority placed on safe management of the agitated patient. At all times, crew and patient safety should be considered paramount.

As such, an emphasis should be placed on chemical restraint vs physical restraint where securing the patient will be required.

Physical restraints have potential to harm the patient, delay definitive care, and place the provider in extended dangerous situations. In general, chemical restraint provides a safer alternative for both patient and provider.

To this end, please see and follow 2030 Agitated Patient Protocol. The following applies when physical restraints are still deemed necessary in conjunction with or instead of chemical restraint options.

INDICATIONS

- Use of physical restraint on patients is permissible if the patient poses a danger to himself 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.
- Contact medical control for physician direction if there is uncertainty as to whether or not the use of restraints is warranted to transport the unwilling or uncooperative patient.
- Restraints are to be applied to patients only in limited circumstances:
  - A patient whose medical or mental condition warrants immediate ambulance transport and who is exhibiting behavior that the prehospital provider feels may or will endanger the patient or others.
  - The prehospital provider reasonably believes the patient's life or health is in danger and that delay in treatment and transport would further endanger the patient's life or health, and there is no reasonable opportunity to obtain the necessary consent to provide treatment or obtain informed refusal.
  - The patient is being transported under the direction of a mental health hold, or police custody.

PRECAUTIONS / COMPLICATIONS

- Restraints shall be used only when necessary to prevent a patient from seriously injuring themselves or others (including the ambulance crew), and only if safe transportation and treatment of the patient cannot be done without restraints. They may not be used as punishment, or for the convenience of the crew.
- 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.
- Be sure to evaluate the patient adequately to determine the medical condition, mental status and decisional capacity of the patient. The hostile, angry, unwilling patient with decision-making capacity may refuse treatment.
- Be sure that restraints are in good condition (will not break and will not injure the patient).
- Do not use "hobble" restraints and do not restrain patient in the prone position.
- Ensure that patient has been searched for weapons.
- Aspiration can occur, particularly if the patient is supine. It is the responsibility of the attendant to continually monitor the patient's airway.
- Nerve injury can result from hard restraints.
- Do not overlook the medical causes for combativeness, such as hypoxia, hypoglycemia, stroke, hyperthermia, hypothermia, or drug ingestion.

(CONTINUED)

RESTRAINTS

TECHNIQUE

- Determine that the patient's medical or mental condition warrants ambulance transport to the hospital and that the patient lacks decision-making capacity, or there is basis for police custody or a mental health hold to be instituted.
- Treat the patient with respect. Attempts to verbally calm the patient should be done prior to the use of restraints. To the extent possible, explain what is being done and why.
- Have all equipment and personnel ready (restraints, suction, a means to promptly remove restraints, and adequate number of personnel).
- Use assistance such that, if possible, one rescuer handles each limb and one manages the head or supervises the application of restraints.
- Consider the patient's strength and range of motion in the need for and method of applying restraints.
- Apply restraints to the extent necessary to subdue the patient**.**
- After application of restraints, check all limbs for circulation. During the time that a patient is in restraints, an assessment of the patient's condition including assessment of the patient's airway, circulation and vital signs shall be made at least every fifteen minutes, but more frequently if conditions warrant.
- During transport and pending the arrival at the hospital, the patient shall be kept under constant supervision.
- The patient care report shall include documentation of: attempts at verbal persuasion to calm patient; description of the facts justifying use of restraints; the type of restraints; a description of the steps taken to assure that the patient's needs, comfort and safety were properly cared for; the condition of the patient during restraint, including reevaluations during transport; and the condition of the patient on arrival at the hospital.
- Removal of restraints should be done with sufficient manpower and caution for protection of the patient and healthcare providers and only upon request by hospital staff/patient deterioration requiring treatment.
- Utilize police assistance if necessary and if possible.
- Handcuffs or other "hard restraints" are not to be applied by prehospital providers. If police apply handcuffs, the officer should be requested to stay with the patient and ride in the ambulance during transport See *0540 Handcuffed Patient Protocol*.

PRODEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
• Physical Restraints	**SO**	**SO**	**SO**	**SO**	**SO**
• Chemical Restraints	--	--	**VO/SO** (Medication dependent)	**SO**	**SO**

Richmond Agitation-Sedation Scale (RASS)

Score	Term	Description	
+4	Combative	Overly Combative, violent, immediate danger to staff	
+3	Very Agitated	Pulls or removes catheters or tubes; aggressive	
+2	Agitated	Frequent, non purposeful movement; fights ventilator	
+1	Restless	Anxious, but movements are not aggressive or vigorous	
0	Alert and Calm		
-1	Drowsy	Not fully alert, but has sustained awakening(eye opening/eye contact to *voice* for ≥ 10 seconds	Verbal stimulation
-2	Light Sedation	Briefly awakens with eye contact to *voice* (< 10 seconds)	
-3	Moderate sedation	Movement or eye opening to *voice*, but no eye contact	
-4	Deep sedation	No response to voice, but movement or eye opening to *physical* stimulation	Physical Stimulation
-5	Unrousable	No response to voice or physical stimulation	

Procedure for RASS Assessment	Score
1. Observe Patient a. Patient is alert, restless, agitated	0 - +4
2. If not alert, state patient's name & say to open eyes and look at speaker a. Pt awakens W/ Sustained eye opening and eye contact b. Pt awakens w/ eye opening & contact, but not sustained c. Pt has any movement in response to voice, but no eye contact	 -1 -2 -3
3. If no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum a. Patient has any movement to physical stimulation b. Patient has no response to any stimulation	 -4 -5

SAR RESPONSE GUIDELINE

Purpose:

- To provide a guideline for joint response between the Archuleta County Sheriff Department Search and Rescue and the Pagosa Springs Medical Center Emergency Medical Services in which the patient can receive the highest level of care possible, the two departments can benefit from the expertise of the other, and that the care can be delivered as safely as possible.

Command Structure

- **SAR Incident Commander (IC) has command over all operations while EMS crews will oversee direct patient care. While EMS crews may make suggestions based on patient condition, EMS crews are to follow SAR IC instructions in matters of safety and operations.**

Response Guidelines:

- The general guide for the department will be to co-respond on calls in which the patient is at a known location and within a two hour (each way) hike or UTV trip.
- Staff will not enter any condition for which they are not properly dressed, equipped or trained to enter into (even if it meets the criteria) and must be willing and able to respond to conditions both current and expected.
- The ambulance responding shall have a minimum of two personnel both of whom will respond to the patient location, therefore, the crew responding will do so on a "volunteer" basis, meaning that we will not assign an employee to hike, or otherwise enter the backcountry if they do not feel comfortable in doing so. The crew answering the SAR call should be the highest level care we can provide.
- EMS staff will not be involved in any technical recue capacity. This includes high angle rope rescue, winter operations (including snowmobile or ski), or any other operations for which they have not had prior PSEMS approved training. Provided the staff member has completed PSMC EMS approved trainings the staff member may participate at the request of the SAR IC.
- Once EMS has been requested for a mission, the on call administrator must be notified prior to sending the crew, and will make the final determination of go or no go for that mission. The shift lead shall be responsible for ensuring that there is adequate coverage prior to contacting EMS administrator on call regarding responding on SAR mission. EMS admin on call will make efforts to provide back-fill for crews if possible
- Every effort will be made to obtain details as to patient location, trail terrain, and weather (both current and expected), through communication with the SAR incident commander prior to departure.
- The PSMC employee will be operating under the PSMC EMS medical protocols for medical care and will fall under the SAR command structure for any non-medical operations.
- The final decision as to whether the PSMC employee will partake in the mission will rest with both the employee and the SAR incident commander. If either person doesn't feel that the employee has the skills to accomplish the mission safely, SAR will provide the rescue to a location where that employee can safely access the patient.
- EMS staff will not partake in any helicopter operations unless you have prior PSEMS approved training, and have the training, skills, and equipment to safely spend the night if the flight out is cancelled.
- **Administrator on call must give prior approval for all helicopter operations**.

SEPSIS ALERT

PURPOSE:

To provide EMS staff with clinical parameters that allow for early recognition and treatment of suspected sepsis, thereby improving the long term prognosis of these patients.

SYSTEMIC INFLAMATORY RESPONSE SYNDROME (SIRS):

The identification of systemic inflammatory response syndrome (SIRS) does not confirm a diagnosis of infection or sepsis, because the features of SIRS can be seen in many other conditions, such as trauma, pancreatitis, and burns. SIRS is not a diagnosis, nor is it a good indicator of outcome. The SIRS criteria may be considered a crude means of stratification for patients with systemic inflammation.

SEPSIS ALERT CRITERIA:

Initiate a sepsis alert for the following patients:

- History suggestive of infection

Pneumonia (Cough/thick sputum)	Abdominal pain and/or diarrhea
Urinary tract infection	Wound infection
Blood Stream Catheter related	Skin/Soft tissue infection

AND

- **At least 2** of the following SIRS criteria
  - Temperature > 100F (38 C) or < 96F (36 C)
  - Pulse > 90
  - Respiratory Rate > 20 or mechanical Ventilation

AND

- Evidence of hypoperfusion
  - Hypotension (SBP < 90 mmHg, or MAP < 65 mmHg), OR
  - Altered mental status

In patients who meet the above the criteria, and have a pulse rate higher than their systolic blood pressure (** shock index > 1) – septic shock is likely.

** Shock Index = heart rate / Systolic Blood Pressure

STROKE ALERT

PURPOSE:

To provide EMS staff with clinical parameters that allow for early recognition and treatment of suspected stroke, thereby improving the long term prognosis of these patients.

Initiate a Stroke Alert for patient's meeting the following criteria:

1. Patient suspected of acute stroke
    a. Sudden numbness, weakness, or paralysis of face, arm or leg especially unilaterally
    b. Positive Cincinnati Stroke Scale (one positive finding is all that is required for a positive Cincinnati Stroke Scale)
    c. Sudden confusion, difficulty speaking or understanding speech
    d. Sudden trouble seeing in one or both eyes
    e. Sudden trouble walking, dizziness, or loss of balance or coordination
    f. Sudden severe headache with no known cause
2. Symptom onset is < 7 hours
3. BGL is above 60 mg/dL or not available
4. No severe trauma or witnessed seizure at onset

Cincinnati Stroke Scale

If *ANY* of the three items is abnormal the sensitivity = 66%, specificity = 87% for acute stroke

1. Facial Droop (abnormal: one side of the face does not move as well as the other)
2. Arm Drift (abnormal: one arm does not move or one arm drifts down compared with the other)
3. Speech (abnormal: slurred, inappropriate words, mute)

TRANSPORT DESTINATION

ONCE EMS IS ACTIVATED

- All patients will be transported to the closest appropriate hospital.
  - For most calls, this will be Pagosa Springs Medical Center (PSMC). See *EXCEPTIONS* below.
- Patients refusing transport to the most appropriate hospital must meet specific criteria in order to legally refuse *(See: 120 Patient Non Transport or Refusal)*.
- Any request for "medical clearance" by law enforcement or other agencies requires transport to the nearest appropriate hospital.

EXCEPTIONS

Contact Medical Control as soon as possible for consultation before bypassing PSMC

Trauma patients

- Specific criteria are outlined by the SWRETAC as to the appropriate destination for trauma patients *(See:0680 Trauma Destination)*. Any patient who meets these criteria must be transported to the nearest appropriate trauma center, which in most cases is PSMC.

Chest Pain

- All STEMI patients east of the Piedra River should be transported to PSMC for thrombolytic therapy.
- STEMI patients west of the Piedra River should be transported directly to Mercy Hospital.

Pregnancy

- PSMC has no labor and delivery (L&D) capabilities beyond the ED, while MRMC has L&D capabilities for pregnancies after 20 weeks of gestation.
- Predicting whether delivery is "imminent" is very difficult and requires constant assessment.
- Water breaking can result in a dramatic change in presentation and may lead to an abrupt increase in the speed of labor.
- The patient should be transported to PSMC if delivery is imminent, including a footling breech presentation.
  - Footling breach is typically managed by c-section. However, the best chance for fetal survival is to attempt at delivery in the PSMC ED, rather than to attempt transport an hour to the OR at Mercy.
  - Indications that suggest delivery is imminent and should go to PSMC:
    - Contractions every 2-3 minutes indicates patient will be pushing soon.
    - A sterile gloved hand can be inserted into the vagina. If your hand is inserted to the depth of your first or second IP joints (at the introitus), the delivery may not have time to get to Mercy. If the depth is to your MCP or the crotch of your hand, the delivery will likely take more time.
  - Indications that suggest a delivery can likely be deferred to transport to Mercy:
    - If a sterile gloved hand inserted into the vagina goes to the depth of the MCP or the crotch of the hand.
    - If there are no presenting parts.
    - If the contractions are 5 minutes or more apart, and there is no urge to push.
    - If there is no history to suggest a fast progression (e.g. multiparity, history of fast deliveries).
- There are some situations where PSMC will be unable to offer any lifesaving measures to the baby and the patient should be transported directly to Mercy for emergent c-section.
  - Arm as the presenting part. Delivery without umbilical cord compression is impossible.
  - Prolapsed umbilical cord.

        - Use a sterile hand to elevate the baby's head/body to provide room between the cord and baby, to maintain cord perfusion; maintain this during the entire transport and into the OR.
    - For arm and cord presentations, can consider tocolysis with nifedipine.

- Contact medical control for pregnancy related emergencies where delivery is not imminent for transport direction.

Patient requests to go to a clinic.

- Inform the patient that EMS is required to transport to the nearest appropriate emergency room.

Patient refuses to be transported to nearest appropriate hospital.

- Any patient with decision making capacity has the right to be transported to a specific hospital. PSMC's EMS has a duty to transport patients to the closest appropriate hospital. If the system status allows, the patient's request can be honored if they are informed that the transport will likely not be covered by insurance. If PSMC EMS crew is unable to accommodate a transport to a facility that is not PSMC because of system status, the patient may sign an AMA refusal and transport themselves elsewhere, provided they have decision making capacity.

Table of Contents

PSMC TRAUMA TEAM ACTIVATION CRITERIA

LEVEL 1

- Penetrating injuries to head, neck, torso, or extremities above knee or elbow
- Flail chest
- Unstable pelvic fractures
- Full-thickness/3rd degree burns (consult burn center)
- Suspicion of significant intra-abdominal injury
- Amputation above the wrist or ankle
- Paralysis or other evidence of spinal cord injury
- Crushed, de-gloved, mangled or pulseless extremity
- Open or depressed skull fracture
- Provider discretion
- Any patient meeting the Level 2 criteria with the following physiological signs:
    - Systolic BP < 90, <110 in age >65, hypotension in peds
    - Respiratory Rate of < 10 or > 29 (sustained)
    - GCS < 9
    - Intubation or assisted ventilation or respiratory distress
    - MCI designated “Red” patients

LEVEL 2

- Falls > 15 ft adults or 2x the height of a child
- Suspected head injury with loss of consciousness and/or thoracic trauma on anticoagulation/anti-platelet therapy
- Auto vs pedestrian/bicyclist thrown, run over, or with significant impact
- Motorcycle crash > 20 mph
- High risk auto crash
    - Significant intrusion of vehicle (≥ 12” occupant compartment)
    - Ejection (partial or complete)
    - Death in same passenger compartment
    - Rollover at significant speed
- Two or more proximal long bone fractures
- High energy electrical injury
- High energy dissipation events
    - Ejection from motorcycle, ATV, animal, etc
    - Striking a fixed object with momentum
    - Blast or explosion
- Burns > 10% TBSA (2nd or 3rd degree) and/or burns to:
    - Hands, face, feet, groin
    - Inhalation or chemical
- Patient found unresponsive or poor historian of events - no witness corroboration of events to prove non-traumatic cause
- Significant traumatic event in which patient is >20 wks pregnant
- Suspected non-accidental trauma
- Risk factors such as age, intoxicants and other co-morbid conditions
- Provider discretion

TRAUMA DESTINATION

APPROACH

- The Trauma Center for Archuleta County and response areas within Hinsdale and Mineral Counties is Pagosa Springs Medical Center (PSMC), a Level 4 Trauma Center.
    - The exception being, if the incident is west of where the Piedra River crosses Hwy 160 or points west, then Mercy Regional Medical Center (MRMC), a Level 3 Trauma Center would be the closest.
- Patients meeting Trauma Alert criteria should be brought to the closest trauma center and the trauma center should be advised of trauma activation and level as soon as possible.

- If patients do not meet criteria, the provider may still initiate a trauma activation based on patient presentation and/or mechanism if they feel it's appropriate.

- The goal of Trauma care is to minimize the time from incident to Trauma Center. The Trauma Center in this case being a Level 1 or 2. These are located in Denver, Colorado Springs, or Albuquerque. To that end, our approach is to bring major trauma patients to PSMC (or MRMC if closer) for stabilization and they will arrange for transport to Level 1 or 2 Trauma Center.

- In general, ground transportation to these facilities is often faster than helicopter unless the patient is in the backcountry (While flight time may only be 15-20 minutes, you must consider that there is prep time to launch, landing and spooling down, packaging the patient and takeoff prep which can add a half hour or more).

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PATIENT ASSESSMENT

For the purposes of this document the definition of a patient is the same as the definition outlined in protocol *0110 Patient Determination – "Patient or No Patient"*

PATIENT ASSESSMENT

- At a minimum, when contact is established with those for whom PSMC EMS is dispatched, an appropriate initial assessment will be performed and documented. It will be based on dynamic variables including, but not limited to, initial assessment findings, acuity, chief complaint, consent, evident threat to patient's life or limb, and scene safety. The extent of secondary, detailed, or focused assessments should conform to medical best practices, insofar as equipment is available and providers are trained to conduct such assessments. Use or omission of indicated assessments or therapies will be appropriately documented in the narrative section of the PCR. Keep in mind the old adage: "if you don't document it, you didn't do it!"

INITIAL ASSESSMENT

- For actual or potential patients with whom providers make contact, and for whom a visual assessment can be conducted, the following represents minimal required assessment to be performed and documented:
  - Physical position (prone, supine, recumbent, sitting, standing/ambulatory)
  - Mental status (GCS or AVPU)
  - Airway status (protected, compromised)
  - Breathing condition (effort, regularity, approximate rate)
  - Circulatory condition (minimum: perfusion status of skin or nail beds; preferred: temperature, moisture of skin, and presence or absence of radial or central pulses)
  - Presence or absence of potentially morbid or mortal disabilities

BASELINE VITALS

- Minimal baseline vital signs will include but are not limited to:
  - Breathing rate
  - Palpated pulse rate
  - Blood pressure (preferably manual)
  - GCS
- If a provider questions the reliability of values, validation by another provider or method is advised.

DETAILED ASSESSMENT, DIAGNOSTICS, AND VITAL SIGNS

- A variety of tools are available to aid in patient assessment. These tools should be used to confirm or rule out your working differential and will help form and order your differential diagnoses. The following should be included in detailed assessments with the understanding that paramedic discretion and critical thinking is encouraged. It is impossible to account for all the variations in patient presentation. With that understood, omission of some of these diagnostic tools is understandable and acceptable. Using more than the minimum is also acceptable.

(Continued)

PATIENT ASSESSMENT

Detailed assessment should include the following:

- Temperature
  - Altered mental status
  - Exposure to elements
  - Suspected febrile seizure
  - Suspected sepsis
  - Suspected stimulant toxicity

- Blood Glucose Level
  - Altered mental status
  - Behavioral abnormalities
  - Known or suspected metabolic or genetic diseases/abnormalities
  - Seizures
  - Suspected stroke/CVA

- Pulse Oximetry
  - Altered mental status, syncope, near syncope
  - Any patient with an advanced airway or with airway adjuncts in place
  - Cardiac dysrhythmias
  - Chemical or pharmaceutical toxicity
  - Febrile patients
  - Respiratory distress
  - Suspected ACS or known STEMI
  - Suspected sepsis
  - Suspected Stroke/CVA
  - Ventilatory abnormality or complaint, including airway burns

- End Tidal CO2
  - Altered mental status, syncope, near syncope
  - Any patient with an advanced airway or with airway adjuncts in place
  - Most patients in whom oxygen is indicated
  - Suspected ACS or known STEMI
  - Suspected sepsis
  - Suspected poor perfusion
  - Ventilatory abnormality or complaint, including airway burns

- ECG Monitoring
  - ACS
  - Advanced airway placement
  - Altered mental status, syncope, near syncope
  - Chest pain besides ACS
  - Exposure to elements
  - Suspected febrile seizure
  - Suspected sepsis
  - Suspected stimulant toxicity

(Continued)

PATIENT ASSESSMENT

- ECG 12-Lead (printed)
  - Abnormal or irregular pulse or palpitations
  - ACS
  - Altered mental status, syncope, near syncope
  - Chemical or pharmaceutical toxicity
  - Dyspnea
  - Return of Spontaneous Circulation (ROSC)
  - Suspected stroke (CVA)
  - Unexplained upper GI complaint

REASSESMENT FOR COMPARISON TO BASELINE FINDNGS

- Reassessment of vital sign values should be conducted:
  - Approximately every 5 - 10 minutes for unstable patients
  - Approximately every 15 - 20 minutes for stable or asymptomatic patients
  - Within 5 minutes of administration of pharmaceuticals, if possible
  - For any patient with baseline values outside of normal reference range

DOCUMENTATION OF ASSESMENT FINDINGS

- Documenting "no abnormal findings on assessment" does **NOT** meet the minimum standard for documentation. You must actually document what you assessed and found, as well as, what you didn't find to paint a clear picture of what you looked for.
  - Examples
    - Skin: warm, dry to touch, appearing well perfused and of appropriate color for race and ethnicity
    - Patient denies: C/P, SOB, N/V/D, headache dizziness, visual or auditory disturbances, numbness or tingling of extremities, recent illness or injury, recent ingestion of EtOH or illicit drugs, possibility of pregnancy.
    - LS: C=B (lung sounds clear and equal bilaterally)
    - Abdomen: soft, non-tender to palpation X 4, no distention rigidity or guarding not, No palpable masses
    - Extremities: Continuous spontaneous and purposeful movement of extremities X 4, distal CMS intact

AIRWAY MANAGEMENT

INDICATIONS

- Airway management is indicated for **any** patient who is unable to adequately ventilate themselves
- The goal of airway management is maximization of oxygenation and ventilation in all cases
- Waveform end tidal capnography (EtCO2) is required to be used for any form of assisted or artificial ventilation – this includes BVM, NIPPV (CPAP), I-Gel, or intubation

PRECAUTIONS

- The following protocols are recommended as an overview for approaching difficult medical and trauma airway problems. They assume that the responder is skilled in the various procedures, and will need to be modified according to training level.
- Advanced procedures should only be attempted if simpler ones fail and if the technician is qualified. Individual cases may require modification of these protocols, in this case consult medical control.
- BVM ventilation should be performed with the two thumbs down technique, PEEP and manometer.
- Neck extension may be difficult in elderly persons with extensive arthritis and little neck motion. Do not use force; jaw thrust or chin-lift without head tilt will be more successful.
- Children's airways have less supporting cartilage; overextension can kink the airway and increase the obstruction. Watch chest rise to determine the best head angle.

POTENTAL COMPLICATIONS

- Cervical spinal cord injury from neck hyperextension in trauma victim with cervical fracture
- Death due to inadequate ventilation or hypoxia
- Nasal or posterior pharyngeal bleeding due to trauma from airway adjuncts.
- Increased airway obstruction from tongue following improper oropharyngeal airway placement
- Aspiration of blood or vomitus from inadequate suctioning and continued contamination of lungs from upper airway

TECHNIQUE

Medical Respiratory Arrest

- Open airway using head tilt-chin lift or head tilt-neck lift.
- Suction as needed
- Ventilate with BVM and supplemental oxygen. (If unable to ventilate reposition and insert OPA. If still unsuccessful, visualize airway and remove any visible obstruction with Magill forceps. If unable to visualize any obstruction begin chest compressions)
- Insert nasopharyngeal airway or oropharyngeal airway if patency is difficult to maintain.
- Perform endotracheal intubation (see 1150 Oral Endotracheal Intubation Protocol) prior to transport if arrest continues.

(CONTINUED)

AIRWAY MANAGEMENT

Traumatic Respiratory Arrest

- Open airway using jaw thrust maneuver, protecting neck. Have assistant provide continuous stabilization of head and neck. Draw tongue and mandible forward if needed in patients with facial injuries.
- Suction as needed
- Ventilate with BVM and supplemental oxygen. (If unable to ventilate - reposition and insert OPA. If still unsuccessful, visualize airway and remove any visible obstruction with Magill forceps. If unable to visualize any obstruction begin chest compressions)
- Perform oral endotracheal intubation (see 1150 Oral Endotracheal Intubation Protocol) while maintaining in-line immobilization of neck.

Traumatic Respiratory Insufficiency

- Open airway using jaw thrust maneuver, protecting neck. Have assistant provide continuous stabilization of head and neck. Use hand to draw tongue and mandible forward if needed with facial injuries
- Suction as needed
- Administer high flow O2; support with BVM ventilations as needed
- Consider CPAP if indicated
- Perform nasal endotracheal or oral endotracheal intubation if patient is unable to adequately protect airway nor able to adequately oxygenate and ventilate. (See 1130 Nasal Endotracheal Intubation or 1070 Chemically Facilitated Intubation Protocol).

AIRWAY SUCTIONING

INDICATIONS

- To remove foreign materials from the airway
- To remove excess secretions or pulmonary edema sputum in upper airway or lungs (with endotracheal tube in place)
- To remove meconium or amniotic fluid in mouth, nose and oropharynx of newborn

PRECAUTIONS / COMPLICATIONS

- Hypoxia due to excessive suctioning time without adequate ventilation between attempts
- Persistent obstruction due to inadequate tubing size for removal of debris
- Lung injury from aspiration of stomach contents due to inadequate suctioning
- Asphyxia due to recurrent obstruction if airway is not monitored after initial suctioning
- Conversion of partial to complete obstruction by blind attempts at airway clearance
- Trauma to the posterior pharynx from forced use of equipment
- Vomiting and aspiration from stimulation of gag reflex
- Complications may be caused both by inadequate and overly vigorous suctioning. Technique and choice of equipment are very important. Choose equipment with enough power to suction large amounts rapidly to allow time for ventilation.
- **Proper airway clearance can make the difference between a patient who survives and one who dies. Airway obstruction is one of the most common treatable causes of prehospital death.**

TECHNIQUE

Suction of the adult/child:

- Turn patient on side if possible, to facilitate clearance.
- Open airway and inspect for visible foreign material.
- Remove large or obvious foreign matter by "raking it" from the airway with suction catheter, OPA or Magill forceps. Use of an oropharyngeal airway (do not pry) to keep airway open can be useful.
- Attach Ducanto suction catheter (or use suction tubing open end for large amounts of debris).
- Insert tip into oropharynx under direct vision, with sweeping motion.
- Ventilate and oxygenate the patient as needed
- Continue intermittent suction interspersed with active oxygenation by mask or cannula. Use positive pressure ventilation if needed (CPAP or BVM as appropriate)
- If suction becomes clogged, dilute by suctioning water to clean tubing. If suction clogs repeatedly, use connecting tubing alone, or manually remove large debris.

Suction of the newborn:

- Use a bulb syringe or soft suction catheter with the lowest suction setting that is effective.
- As soon as infant's head has delivered, insert suction tip into the mouth and back to oropharynx.
- Apply suction while **slowly** withdrawing catheter from the mouth.
- Insert catheter tip into each nostril and back to posterior pharynx.
- Apply suction while slowly withdrawing catheter from each nostril.
- As soon as infant has delivered, repeat process.
- If there is evidence of meconium aspiration, suction trachea using a soft suction catheter or a meconium aspirator and appropriately sized ET tube under direct vision with laryngoscope.

(CONTINUED)

AIRWAY SUCTIONING

Suction of endotracheal tube:

- Attach soft suction catheter to tubing of suction device
- Pre-oxygenate patient.
- Detach bag from endotracheal tube and insert tip of suction catheter **without** suction applied.
- When catheter tip has been **gently** advanced as far as possible, apply suction and withdraw catheter slowly in a twisting motion.
- Rinse catheter tip in sterile water or saline.
- Repeat as needed. Re-oxygenate patient prior to suctioning again.

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Suction of adult/child	**SO**	**SO**	**SO**	**SO**	**SO**
Suction of newborn	**SO**	**SO**	**SO**	**SO**	**SO**
Suction of endotracheal tube	--	**SO**	**SO**	**SO**	**SO**

BANDAGING

INDICATIONS

- To stop external bleeding by application of direct and continuous pressure to wound site
- To protect patient from contamination to lacerations, abrasions, burns

PRECAUTIONS / COMPLICATIONS

- Although external skin wounds may be dramatic, they are rarely a high management priority in the trauma victim.
- Loss of distal circulation from bandage applied too tightly around extremity; for this reason, do not use elastic bandages or apply bandages too tightly.
- Restriction of breathing from circumferential chest wound splinting
- Continued bleeding no longer visible under dressings. (This is particularly common with scalp wounds that continue to lose large amounts of unnoticed blood.)
- Inadequate hemostasis: some wounds require continuous direct manual pressure to stop bleeding.

TECHNIQUE

- Use BSI.
- Control hemorrhage with direct pressure, using sterile dressing.
- Assess patient fully and treat all injuries by priority once assessment is complete.
- Remove gross dirt and contamination from wound: clothing, dirt, gasoline, acids, or alkalis.
- Use copious irrigating saline or tap water for chemical contamination.
- Evaluate wound for depth, presence of fracture in wound, foreign body, or evidence of injury to deep structures.
- Note distal motor, sensory, and circulatory function prior to applying dressings.
- Apply sterile dressing and or hemostatic gauze to wound surface. If desired, wrap dressing with clean gauze or cloth bandages applied just tightly enough to hold dressing securely – keeping in mind that the ED will need to remove dressing upon arrival. If the wound covering can be held in place by patient or provider, that is acceptable.
- Assess wound for evidence of continued bleeding, add additional bandaging over the first if it becomes saturated.
- Check distal pulses, color, capillary refill, and sensation after bandage applied.
- Continue to apply direct hand pressure over dressing.
- For arterial or major bleeding not likely to be controlled by direct pressure, apply tourniquet (see 1240 Tourniquet Protocol)
- For deep or gaping muscle wounds in which bleeding cannot be controlled with direct pressure, pack the wound with sterile gauze or quik-clot than apply a sterile dressing with pressure.

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
Bandaging of adult/child	**SO**	**SO**	**SO**	**SO**	**SO**
Topical Hemostatic Agents	**SO**	**SO**	**SO**	**SO**	**SO**

BLOOD DRAW

INDICATIONS

- Patients receiving an IV in the field.

PRECAUTIONS / COMPLICATIONS

- Improper technique in obtaining the specimen will result in inaccurate or invalid test results.

TECHNIQUE

- After initiating an IV and removing the needle, attach the Vacutainer holder to the hub of the IV catheter.

- Fill tubes in the following order:

    1. Blood cultures (Aerobic (blue top) followed by Anaerobic (red/purple top)
    2. IF cultures are not drawn: fill J-loop with blood using clear top
    3. Blue top
    4. Red top
    5. Green top
    6. Lavender top

- Tubes should be inverted gently back and forth several times to ensure adequate mixing of blood with the substance in the tube. Do not shake the tube as this could cause hemolysis, which could interfere with test results.

- It is very important that we follow CLIA rules regarding the collection of blood samples: **All samples must be labeled at the patient's bedside (no exceptions) and with at least 2 patient identifiers**
    - In ED, every effort should be made to have the ED patient labels attached to each tube along with, time of draw, site of blood draw, and initials of the medic drawing the blood.
    - Whether placing ED labels or hand writing information on the tubes, all tubes must have the following information:
        - Patients name,
        - DOB,
        - Date of collection,
        - Time of collection,
        - Site of collection,
        - Drawing medic's initials.
    - If patient is a "Doe", mark tubes with appropriate "Doe" that coincides with hospital "Doe" label and room number as the two identifiers.
        - i.e. if hospital has patient listed as Kilo Doe, make sure your blood tubes reflect that and not just Jane/John Doe.

- The tubes should be placed in a small biohazard bag and handed to the RN attending the patient, or lab tach if available, on completion of labeling.

(CONTINUED)

BLOOD DRAW

PROCEDURE	EMT B IV	AEMT	EMT I/99	EMTP	CCP
Blood Draw	**SO**	**SO**	**SO**	**SO**	**SO**

BAG VALVE MASK VENTILATION

INDICATIONS

- Provide positive pressure mechanical ventilation for patients who are not breathing **adequately** due to respiratory depression, failure, or arrest.

PRECAUTIONS / COMPLICATIONS

- It is easy to force air into the stomach and cause vomiting ventilate slowly and gently. The gastric sphincter open at around 25 cmH20 – using the manometer try to keep pressures below 25-30 cmH2O
- Aspiration from vomiting will have a negative effect on the patient's recovery.
- To avoid aspiration
  - Squeeze the bag slowly for adults 1 second of ventilation and 5 seconds of exhalation
  - Ventilate at the proper tidal volume for the age of your patient – one hand is generally sufficient to deliver adequate tidal volume, avoid touching plastic to plastic when squeezing the bag
- If a pneumothorax is present, assisted ventilation can make it worse or convert to a tension pneumothorax. Be observant and prepared, but do not withhold ventilation.
- Prepare for advanced airway procedures and/or chest decompression if needed.
- Early intubation may be of benefit for patients who continue to bleed or vomit or for those patients in whom the mask is not effective (poor seal or persistent obstruction)

TECHNIQUE

- Select proper size mask and bag for the age of the patient
- Set PEEP between 5 and 10 cmH20
- Attach EtCO2 between mask and bag – HEPA filter should be closest to patient with EtCO2 next
- Perform head tilt chin lift or jaw thrust as indicated for the patient.
- Suction as needed prior to ventilation
- Ensure mask seal using the two thumbs down technique - Properly sealing the mask against the face is critical to effective positive pressure ventilation. Once mask seal is obtained it should not be released – releasing the mask seal allows the residual PEEP in the airway to be released.
- Using the timing light squeeze the bag slowly and gently delivering ventilation while the light is illuminated. Avoid pressures greater than 30 cmH2O.
- Look, listen, and feel for air movement.
- Assess effectiveness of ventilations: chest rise, breath sounds, patient's color and heart rate; also assess with continuous pulse oximetry and EtCO2. If you have a positive EtCO2 waveform air is getting in – lack of response is likely due to another issue. **Increase PEEP not rate** if oxygenation seems inadequate.
- If ventilation is not satisfactory, reposition and re-suction airway. (If still unsuccessful, see 2040 obstructed airway protocol).
- Feel for air leak or resistance to air passage. Adjust mask fit as needed.
- If patient resumes spontaneous respirations, continue to administer supplemental oxygen.
  - Intermittent assistance with ventilation may still be needed.
- Insert oral or nasal airway to assist airway patency if the patient will tolerate it.

(CONTINUED)

BAG VALVE MASK VENTILATION

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Bag Valve Mask ventilation of adult/child	**SO**	**SO**	**SO**	**SO**	**SO**

- The chart below is a general guide only. Use the mask that fits and only ventilate until the chest begins to rise.
- We carry two sizes of BVM one for neonates and one for everyone else. The larger BVM has two size masks one for children/small adults and one for adults – use the mask that seals the best for you. The smaller bag size will still deliver adequate tidal volume without a two handed squeeze or touching plastic to plastic.

AGE	VENTILATION RATE (per min)	TIDAL VOLUME (ml)	MASK SIZE	BAG SIZE
0 to 1 year	40 - 60	30 – 100	Neonate / Infant	Neonate/infant
1-8 years	20	100 - 250	Infant / Small Adult	Pediatric / Adult
8-14 years	12	250 - 500	Small Adult / Med Adult	Pediatric / Adult
>14 years	10 (use O_Two timing light included in BVM)	500 - 800	Small Adult / Med Adult /	Pediatric / Adult

CAPNOGRAPHY

INDICATIONS

- **MANDATORY USES:**
  - To rule out esophageal intubation and confirm endotracheal tube position in all intubated patients.
  - Any time an opiate and a benzo are combined
  - Patients in respiratory distress – those requiring NRB, CPAP, BVM, I-Gel
  - Suspected ACS or known STEMI
  - Suspected sepsis
  - Suspected shock of any nature
  - Altered mental status, syncope, near syncope
  - Confirmation of suspected poor perfusion before performing advanced procedures (ie cardioversion, pacing, needle decompression etc.)
- To identify late endotracheal tube dislodgement
- Most patients in whom oxygen is indicated
- Hyperglycemia
- To monitor ventilation and perfusion in any ill or injured patient

To understand and interpret capnography, remember the 3 determinants of ETCO2:

- Alveolar ventilation
- Pulmonary perfusion
- Metabolism

If EtCO2 values are outside the normal ranges (35-45 mmHg) your patient likely has a ventilation or perfusion problem that needs to be corrected. While metabolic problems can and do occur, assume the cause of the abnormal value is perfusion or ventilation (or both) until proven otherwise. EtCO2 values are very accurate (capnography is as diagnostic as a 12 lead), however they lack specificity and it is up to us to identify the cause.

- In respiratory distress patients the objective of treatment is to trend EtCO2 **DOWN**
- In patients with a metabolic/perfusion problem the objective of treatment is to trend EtCO2 **UP**

*** NOTE *** While DKA presents with acute tachypnea (Kussmaul's respirations – it is in fact a METABOLIC problem and as such the objective of treatments in that case would be trend EtCO2 UP)

CONTRAINDICATIONS

None

TECHNIQUE

- In patients receiving BVM ventilation place the ETCO2 detector between the HEPA filter and the BVM
- In patients with Endotracheal Tube or I-gel placement: place ETCO2 detector in-line between HEPA filter/airway adaptor and BVM after airway positioned and secured
- Patients without ETT or advanced airway in place: place ETCO2 cannula on patient. May be placed under CPAP or NRB facemask
- Assess and document both capnography waveform and ETCO2 value

(CONTINUED)

CAPNOGRAPHY

Sudden loss of ETCO2:

- Tube dislodged (solid wave form line)
- Circuit disconnected (dotted wave form line)
- Cardiac arrest

High ETCO2 (> 45)

- Hypoventilation/CO2 retention

Low ETCO2 (< 35)

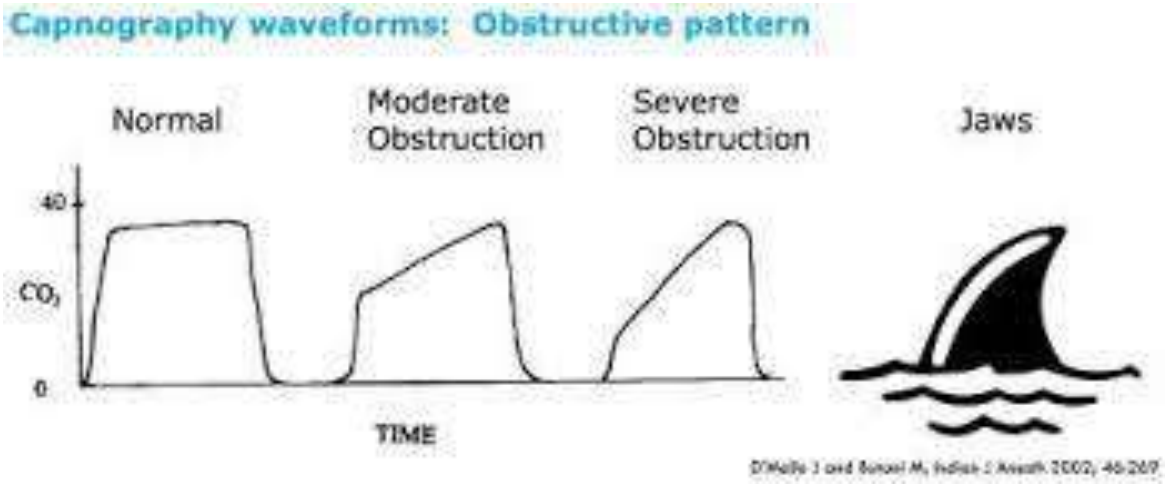
- Hyperventilation
- Low perfusion/Metabolic Abnormality: DKA, shock, PE, sepsis, cardiac abnormality

Cardiac Arrest:

- 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
- If ETCO2 is dropping, change out person doing chest compressions
- 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
- Sudden rise in EtCO2 may be an indicator of ROSC

ETCO PEARLS

- CO2 values are NOT based on age – normal values are normal values from neonate to elderly
- CO2 diffuses through water/fluid at the same rate as air (pulmonary edema without bronchospasm will NOT cause a slurring of the wave – see image below)
- Using the above pearl – The capnography waveform can help differentiate between COPD/CHF – crackles in the lungs with a normal waveform should lead you towards CPAP and nitrates as opposed to bronchodilators
- A slurring between phase II and phase III = evidence of uneven alveolar emptying indicating the need for a bronchodilator – the more severe the slur – the worse the constriction/obstruction is
- In hyperglycemic patients who have end tidal values < 30 mmHg strongly suspect metabolic acidosis secondary to DKA
- An EtCO2 < 25 mmHg is roughly equivalent to a Lactate of 4 mmol
- In order to register as an adequate breath EtCO2 levels have to be ~ 8 cmH20 – It is possible to have a very small wave form and the apnea alarm still be going off.



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CAPNOGRAPHY

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• End-tidal CO2 application, monitoring and interpretation	**SO**	**SO**	**SO**	**SO**	**SO**

CARDIOVERSION

INDICATIONS

- Unstable Tachycardia with a pulse and signs of poor perfusion
    - Altered level of consciousness
    - Chest pain
    - Pale, cool skin
    - Hypotension

PRECAUTIONS

- Precautions for defibrillation apply. Protect rescuers!
- If the defibrillator does not discharge on "sync" adjust the lead amplitude until the monitor marks the QRS complex and attempt cardioversion again.
- 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 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 *2110 Cardiac Arrest Protocol*
- 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

(CONTINUED)

CARDIOVERSION

TECHNIQUE

Symptomatic Tachycardia with signs of poor perfusion
↓
If ventricular rate is > 150 beats/min., with signs of poor perfusion prepare for CARDIOVERSION

(Cardioversion is generally not needed for rates < 150 beats/min.)
↓
While preparing for cardioversion
- Ensure adequate oxygenation, ventilation. EtCO2 preferred.
- establish IV/IO
- Prepare for intubation, including suction

Consider premedication with Midazolam (6270 *Midazolam Protocol*) if patient is awake and alert
↓
Apply pads anterior/lateral (apex)
↓
Engage the synchronization mode by pressing the "sync" button-
Reset this for each cardioversion
↓
Verify that monitor is marking each R wave, indicating sync mode
(adjust lead amplitude if necessary)
↓
Synchronized Cardioversion

ADULT

PRODEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Narrow regular tachycardia • 50-100 • Repeat at 200 J, 300 J, 360 J if necessary	--	--	--	SO	SO

PRODEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Narrow irregular tachycardia • 120 – 200J • Repeat at 200 J, 300 J, 360 J if necessary	--	--	--	SO	SO

PRODEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Wide regular tachycardia • 100J • Repeat at 200 J, 300 J, 360 J if necessary	--	--	--	SO	SO

(CONTINUED)

CARDIOVERSION

ADULT (CONTINUED)

PRODEDURE	EMT IV	EMT I/99	EMTP	CCP
Wide irregular tachycardia • Defibrillate 360J	**SO** **(AED MODE)**	**SO**	**SO**	**SO**

PEDIATRIC

PRODEDURE	EMT IV	EMT I/99	EMTP	CCP
Ventricular tachycardia, Paroxysmal Supraventricular Tachycardia, Atrial fibrillation, Atrial flutter • 0.5-1 J/Kg If not effective, increase to 2 J/kg. • If pulseless VT, may escalate to 4 J/kg.	**--**	**--**	**SO**	**SO**

CHEMICALLY FACILITATED INTUBATION

OVERVIEW

- The focus of this clinical bundle is to optimize oxygenation and first pass success at intubation
- Chemically Facilitated Intubation (CFI) is one of the most serious and potentially dangerous procedures we perform as EMS providers
- Serious interventions require serious oversight
- CFI is the preferred method of securing an adult airway in cases where airway management is needed.
- Each step of the process must be completed before moving on to the next
- Use of the CFI checklist is required for all chemically facilitated intubations
- CFI requires a team approach – to effectively complete the checklist and perform the skills takes four providers on scene – request a second ambulance if fire is unavailable. This is not to say CFI cannot be performed with less than four providers **in extremis**. In cases where CFI is done with less than 4 providers appropriate documentation in the PCR will be needed explaining why.

INDICATIONS

- Patients requiring endotracheal intubation and definitive airway control.
- Patients with poor expected clinical outcome between the scene and the hospital. A patient that is likely to end up being intubated 4 hours later is NOT an indication to initiate CFI at the present
- Patients in respiratory arrest or distress who fail non-invasive airway management (BVM, CPAP)
- Patients in respiratory arrest or distress whose airway reflexes are still present.
- Trismus/clenched jaw
- Age ≥ 13 years.

PRECAUTIONS/CONTRAINDICATIONS

- Contraindicated when non-invasive airway management is able to provide adequate oxygenation, ventilation, and patient is able to protect airway from aspiration for the duration of transport.
- Contraindicated if inability to orotracheally intubate patient such as severe maxillofacial/neck trauma, angioedema or severe anatomic abnormalities is likely
- Neuromuscular blockade ceases the patient's respiratory effort. Use extreme caution with CFI on patients with a difficult airway in whom BVM is not effective or airway adjuncts would not be an option.
- The process of paralyzing a patient chemically does not, in and of itself, alter their ability to perceive their environment or perceive pain. When administering a paralytic, a sedative must also be administered.
- Contraindication to CFI medications (see Rocuronium, Ketamine protocols).

TECHNIQUE

PREPARATION

Prepare Equipment

- BVM with PEEP valve, HEPA filter and EtCO2 in place
- Laryngoscope and handle checked for proper function
- Appropriately sized ETT loaded with stylet or bougie
    - Consider having one size larger and one size smaller than anticipated tube size at hand
- 10 cc syringe
- Bougie
- Decanto suction catheter and suction device
- Tube holder or tie
- Appropriately sized I-gel
- Cric kit

(CONTINUED)

CHEMICALLY FACILITATED INTUBATION

- Meds (push dose epi, induction agent, paralytic)
- NG/OG tube
- Cuff pressure measurement device
- C-collar
- IV Fluids

Prepare Patient

- 4 lead ECG, SpO2, nasal cannula in place
- IV access – preferably two
- O2 6 LPM via nasal cannula

Prepare Yourself and the team

- Verbalize missed airway plan to all members of the team
- Identify, palpate and mark surgical landmarks
- Delegate roles and responsibilities
    - Lead medic – gives instructions, Draws up medications, performs intubation
    - Assistant 1 – IV access, repeat drug order given by lead medic, administer drugs, watches monitor and times, fills out checklist
    - Assistant 2 – Places ECG electrodes, SpO2, connects EtCO2, IV access, responsible for two thumbs down mask seal
    - Assistant 3 – Assists with equipment preparation, IV access, Responsible for bagging patient as needed
- Assess for difficult BVM ventilation
    - BOOTS (Beard, Obese, Older, Toothless, Sounds (snoring, stridor, wheezing))
- Assess for difficult intubation
    - LEMON – (Look external, Evaluate 3,3,2, Mallampati, Obstruction, Neck Mobility)
- Assess for difficult supraglottic device placement
    - RODS – (Restricted mouth opening, Obstruction of upper airway, Distortion/distruption of the airway, stiff lungs (reduced compliance or increased resistance)

SEDATION

- Consider pre-treatment with Fentanyl for patients with possible head injury or multi system trauma. Allow 2 minutes to circulate.
- **Induction:** Ketamine is preferred as it is less vasoactive and may support blood pressure during intubation process.
- Increase O2 flow to 15 lpm
- Be prepared to administer Epi push dose per protocol for episodes of medication induced hypotension at any point throughout the CFI process. The first line management of hypotension not inducted by medication is fluids not epi.
- Be prepared to administer Atropine should the patient become bradycardic.

PREOXYGENATION

- Place OPA
- Position patient “heads up” – 25-30° incline, ears to sternal notch – face parallel to the ceiling for DL, head in neutral position for VL

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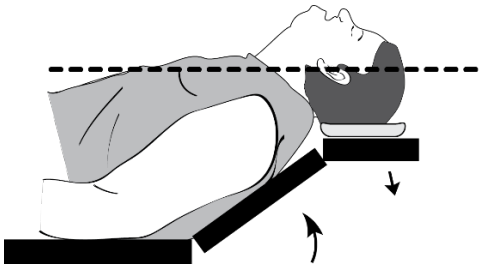
CHEMICALLY FACILITATED INTUBATION



- Perform two handed "thumbs down" mask seal with PEEP set to at least 5 cmH2O
  - Adequate breathing & SpO2 ≥ 94% Maintain BVM mask seal with no ventilations
  - Adequate breathing & SpO2 < 94% Maintain BVM seal with no ventilations and INCREASE PEEP
  - Inadequate breathing: BVM seal with ventilations

- Goal is to Maintain SpO2 ≥ 94%
  - If unable to get SpO2 above 94% using the BVM technique – consider changing out person holding mask, improving manual opening of airway, insertion of bilateral NPA's in addition to OPA, CPAP
  - If still unable to get SpO2 ≥ 94% insert I-gel (This may done before or after Rocuronium administration)
    - If saturations improve to ≥ 94% with I-gel and proceed with intubation
  - Failure to achieve oxygenation prior to intubation attempt has been shown to lead hypoxic brain damage as well as lead to peri-intubation arrest. However, if oxygenation has been optimized and patient still requires intubation due to high risk of decompensation, intubation may be attempted.

PARALYTIC ADMINISTRATION

- Administer Rocuronium
  - Allow a full 90 seconds post administration before intubation attempt
  - If needed allow more time for neuromuscular blockade or administer a second dose if patient is not sufficiently paralyzed

BAIL OUT CRITERIA

- **If any of the following conditions occurs immediately abort the intubation attempt**
  - SpO2 drops below 90%, if preoxygenation status was successfully above 94%.Peri intubation arrest
  - Significant decrease in heart rate
  - Lead medic calls for a bail for any reason

INTUBATE

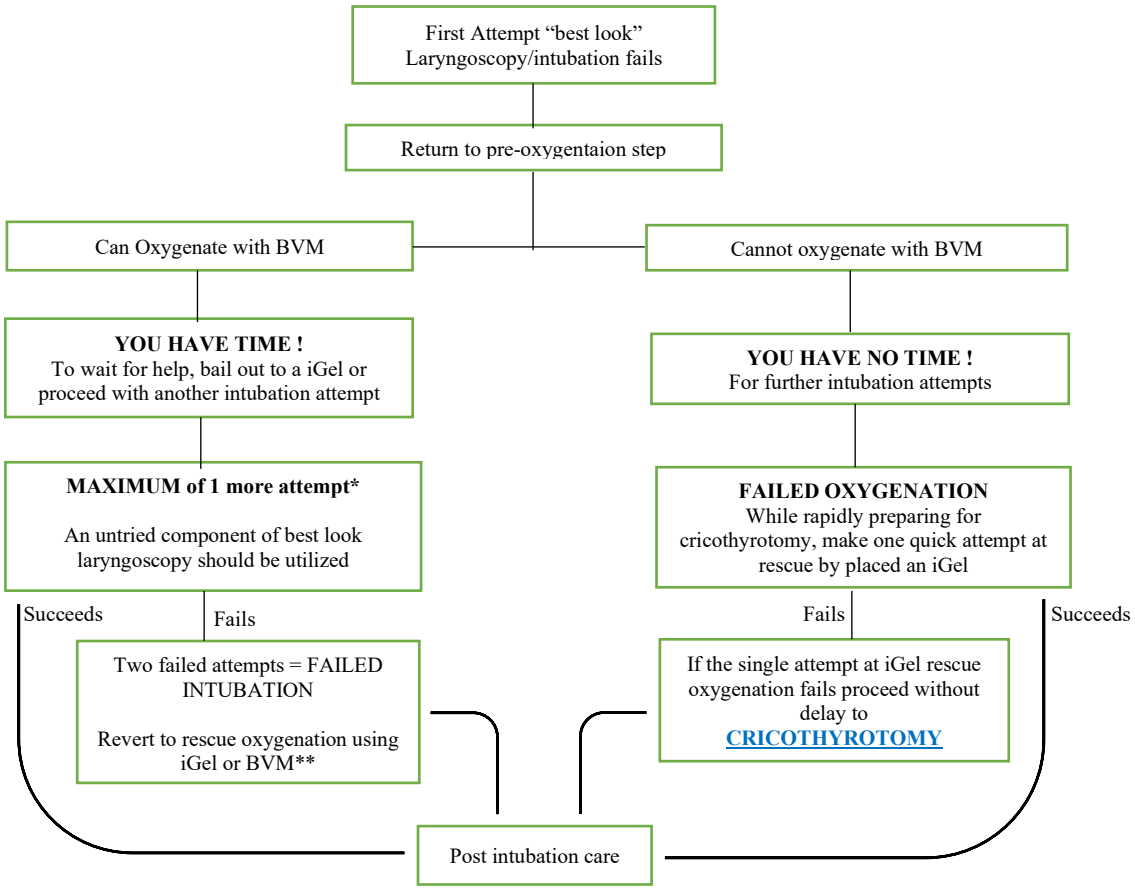
- Consider suction n prior to and throughout the intubation attempt with Dectanto catheter and S.A.L.A.D. maneuver.
- Have assistant ready to help manipulate laryngeal positioning
  - Place the assistant's fingers and lead medic manipulates them to allow for best view – assistant then holds position of best view
- Perform endotracheal intubation per protocol

(CONTINUED)

CHEMICALLY FACILITATED INTUBATION

- Confirm ET tube placement:
  - ETCO2 capnography is the primary confirmation measure.
    - Waveform capnography is **MANDATORY** for confirmation of **ALL advanced airway placements**
  - Positive bilateral breath sounds
  - Negative epigastric sounds
  - Chest rise
  - Patient response including color, pulse-oximetry
- If first attempt is unsuccessful – go to failed airway algorithm (below)
- Secure and note position of tube. Monitor with continuous capnography.
- Place OG/NG tube with low intermittent suction
- Cuff pressure monitoring every 15 minutes, or one thousand feet of elevation change, whichever is more frequent. Cuff pressure should be approximately 20 cm H2O, not to exceed 30 cm H2O.
- Apply C-Collar to help restrict head movement and displacement of the tube during transfer
- Repeat sedation and analgesia.
- Have the accepting physician verify tube placement or follow up if the patient was taken by air ambulance.

Failed Airway Algorithm



* A second attempt at intubation may be made. An untried component of intubation should be used. Switching from VL to DL or vice versa, use of bougie, different tube size, different blade size etc.

** Carefully consider whether injury or swelling may make later intubation possible before reverting to iGel or BVM ventilation – if you are suspicious that airway will worsen consider moving to cricithyrotomy instead

CHEMICALLY FACILITATED INTUBATION

Sedation Maintenance

- The goal of your post intubation management is to provide sedation adequate for ventilator/BVM compliance and patient comfort.
- Ketamine has a half-life of 10-15 minutes, therefore you may need to give a second bolus after securing your intubation and prior to infusion in order to maintain adequate sedation. Waiting too long and then initiating the infusion may leave you behind in terms of adequate blood levels to maintain sedation.
- Augment with fentanyl infusion if needed, especially in injuries/illnesses that involved significant pain.
- Monitor patient for adequate sedation, which is difficult when a patient is paralyzed. Signs of inadequate sedation:
  - Rise in blood pressure or heart rate
  - Increased respiratory rate; over-breathing assisted ventilations.
  - Patient agitation
- Use Richmond Agitation-Sedation Score (RASS) to evaluate agitation-sedation and record in score in PCR

INDUCTION/PARALYTIC DOSING REFERENCE

WIEGHT (Kg)	FENTANYL 1-2mcg/kg	KETAMINE 2mg/kg	ROC 1mg/kg
40	40-80mcg	80mg	40mg
50	50-100mcg	100mg	50mg
60	60-120mcg	120mg	60mg
70	70-140mcg	140mg	70mg
80	80-160mcg	160mg	80mg
90	90-180mcg	180mg	90mg
100	100-200mcg	200mg	100mg
110	110-220mcg	220mg	110mg
120	120-240mcg	240mg	120mg
130	130-260mcg	260mg	130mg
140	140-280mcg	280mg	140mg
150	150-300mcg	300mg	150mg

(CONTINUED)

CHEMICALLY FACILITATED INTUBATION

MAINTENANCE INFUSION DOSES

FENTANYL:	DOSE: 1-5 mcg/kg/hr	Draw up 1000mcg in **100**mL D5W (remove 20mL D5W from bag first) for 10 mcg/mL conc.
VERSED:	DOSE: 0.025-0.2 mg/kg/hr	Draw up 50mg in **100**mL D5W (remove 10mL D5W from bag first) for 0.5mg/ml conc.
KETAMINE:	DOSE: 2-5 mg/kg/hr	Draw up 500mg in **250**mL for 2mg/ml conc.

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

INDICATIONS

- Congestive heart failure exacerbation including pulmonary edema
- Severe bronchospasm from reactive airway (asthma) or obstructive airway disease (COPD)
- Pneumonia
- Suspected moderate to severe carbon monoxide poisoning
- Suspected carbon monoxide exposure in pregnant patient even with mild symptoms
- Persistent hypoxia despite nonrebreather oxygen administration
- NOTE: CPAP is indicated for oxygenation. If there is increased work of breathing, suspicion for hypercarbia, or a patient is "tiring out," the ALS administration of BPAP is indicated.

PRECAUTIONS / COMPLICATIONS

- Patient must be awake and alert
- Patient must have ability to maintain an open airway
- Pneumothorax is no longer considered a contraindication, however, careful monitoring is indicated to avoid progressing a simple pneumothorax to a tension pneumothorax
- Cardiogenic shock: high intrathoracic pressures my exacerbate depressed myocardial function

CONTRAINDICATIONS

- Respiratory arrest
- Agonal respirations
- Unconscious or obtunded
- Penetrating chest trauma
- Persistent nausea/vomiting
- Facial abnormalities/facial trauma
- Active upper GI bleeding or history of recent gastric surgery

TECHNIQUE

- Patient should be in a sitting position and explain the procedure to the patient.
- Attach cardiac monitor and pulse oximeter and nasal ETCO2 monitor (prior to applying CPAP mask).
- Attach CPAP device start at a pressure of 5 cm H_2O and titrate to a maximum of 20 cm H_2O.
- FiO2 is not optimal with this CPAP, place a nasal cannula under the mask and attach to separate oxygen source to help increase the percentage of oxygen being delivered.
- Check for air leaks.
- If respiratory status or level of consciousness deteriorates, remove device and consider BVM ventilation or endotracheal intubation.

ADULT

PRODEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
Continuous Positive Airway Pressure (CPAP) • 5-20 cm H_2O	**SO**	**SO**	**SO**	**SO**	**SO**

SPECIAL CONSIDERATIONS

- Do not remove CPAP until hospital personnel are prepared to switch patient to their equipment.
- Monitor patient for gastric distention, which may lead to vomiting.
- For suspected cardiogenic pulmonary edema, administer sublingual NTG prior to attaching CPAP mask. Consider nitroglycerin infusion.

DEFIBRILLATION

INDICATIONS

- Ventricular fibrillation
- Wide complex tachycardia in pulseless patient

PRECAUTIONS / COMPLICATIONS

- Dry the chest wall if wet.
- Nitroglycerin paste, which is commonly used by cardiac patients, is flammable, and may ignite if not wiped from the chest prior to paddle contact. Other transdermal patches should be removed.
- Defibrillation should be accompanied by visible muscle contraction by patient. If this does not occur, recheck equipment.
- Unsuccessful defibrillation is often due to hypoxia or acidosis. Careful attention to airway management and proper CPR is important.
- Protect rescuers - "Clear" the patient
- Inadequate contact between quick combo pads and skin may cause skin burns.
- Defibrillation may not be successful in ventricular fibrillation due to hypothermia until the core temperature is above 88 degrees F. Prolonged CPR during rewarming may be necessary before conversion is possible.
- Artifact can simulate ventricular fibrillation. A fully awake and well-pefusing patient is unlikely to be experience ventricular fibrillation.

TECHNIQUE

- Place quik-combo pads in appropriate position to determine rhythm.
  - Place one patch just to the right of the upper sternum and below the clavicle, and the other just to the left of the apex, or just to the left of the left nipple in the anterior axillary line.
- Record rhythm
- Check that synchronizer switch is "off."
- Charge defibrillator with patches placed on chest.
- Recheck rhythm. "Clear" the area.

ADULT

PRODEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Pulseless Ventricular tachycardia or ventricular fibrillation (AED disabled) • 360j for all attempts	--	--	**SO**	**SO**	**SO**
Pulseless Ventricular tachycardia or ventricular fibrillation (AED enabled)	**SO**	**SO**			

It is important to perform chest compressions whenever possible, as personnel allows. This includes before applying pads, and during the charge sequence prior to defibrillation. Chest compressions should also be resumed immediately after each defibrillation.

(CONTINUED)

DEFIBRILLATION

PEDIATRIC

- Use pediatric pads or pediatric adapters for paddles
- **For patients ≤10kg (22lbs)**

PRODEDURE	EMT IV	EMTP	CCP
Pulseless Ventricular tachycardia or ventricular fibrillation (AED disabled) • **2** j/kg initial charge • **4** j/kg subsequent charges.		**SO**	**SO**
Pulseless Ventricular tachycardia or ventricular fibrillation (AED enabled)	**SO**		

It is important to perform chest compressions whenever possible, as personnel allows. This includes before applying pads, and during the charge sequence prior to defibrillation. Chest compressions should also be immediately resumed after each defibrillation.

12 LEAD ELECTROCARDIOGRAM

INDICATIONS

- Patients complaining of chest pain or other symptoms that may be cardiac-related. See 2130 chest pain protocol.

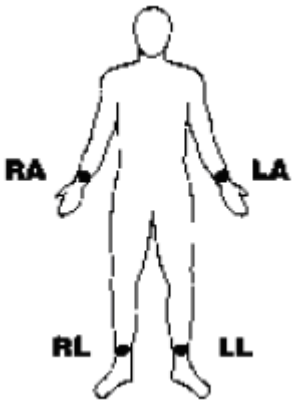
TECHNIQUE

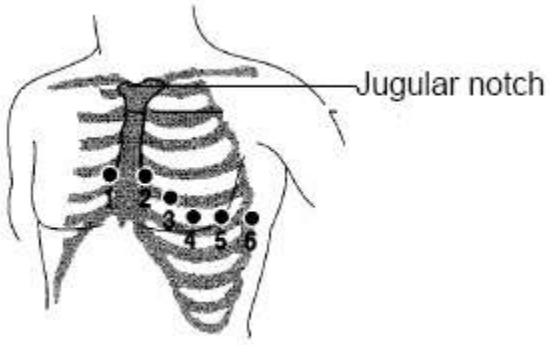
- Expose skin, remove restrictive clothing, being attentive to the patient's privacy.
- Cleanse areas (see diagram) with alcohol.
- Dry skin completely
- Place electrodes according to the diagram below and recheck.
- Have the patient lie completely still, preferably in the semi-fowlers position.
- Check screen to verify adequate tracing.
- Print tracing
- If there is artifact, correct by placing limb leads more proximally and make sure the patient is completely still. Wipe skin with 4x4 or towel and/or shave as needed for good lead contact.
- Review tracing and transport immediately. ALS providers should review the tracing for signs of myocardial injury.
- If possible, transmit the tracing if evidence of ST-elevation MI is present as long as this does not delay transport. Medical control may advise on additional interventions as well as the appropriate destination and advise the receiving facility as soon as possible (See 0500 Cardiac Alert Protocol). If the patient is experiencing a myocardial infarction, the destination hospital will be able to prepare for any further necessary interventions such as percutaneous coronary intervention or thrombolysis.

ADULT

PRODEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• Place leads and acquire 12 lead	**SO**	**SO**	**SO**	**SO**	**SO**
• Interpret 12 lead	--	--	**SO**	**SO**	**SO**

Placement of EKG leads





GASTRIC TUBE INSERTION

INDICATIONS

- Distended abdomen with severe abdominal pain
- Prevention or treatment of abdominal distention in the patient in whom an endotracheal tube or supraglottic airway has been placed.

CONTRAINDICATIONS

- Nasogastric tubes are contraindicated in those with craniofacial trauma, recent nasal surgery, or bleeding problems

PRECAUTIONS / COMPLICATIONS

- Do not force NG tube. Severe bleeding can result especially in patients taking anti-clotting medications
- Consider Neo-synephrine
- Use caution with head injury. Stop insertion if any resistance is met.
- May stimulate vomiting and cause aspiration in the patient that is unable to protect their airway.

TECHNIQUE

- Measure tube from tip of nose, around ear, to epigastrium and mark measurement on tube.
- For those patients with an endotracheal tube, orogastric tubes are preferred. Insert tube alongside endotracheal tube.
- For those with supraglottic airways with a gastric port, simply insert the gastric tube in the designated gastric port
- For the awake patient, explain the procedure to the patient.
- Select tube based upon naris size
- 'Work' tube to add a curve and flexibility to tube.
- Lubricate the end of the tube
- Have patient place their chin toward their chest if patient does not have c-spine trauma
- Insert NG tube in the larger naris (usually R)
- Insert tube, when patient feels the urge to gag, urge them to swallow and advance tube.
  - If a cup of water and straw are available have patient suck through straw while inserting tube.
- Stop at mark and attach a large syringe or bulb syringe to tube.
- Squeeze while listening over epigastrium.
- **NOTE: If breath sounds are noted from the tube or patient becomes short of breath, remove tube promptly.**

PROCEDURE	EMT IV	AEMT	EMT I	P	CCP
Nasogastric tube insertion	--	--	--	**SO**	**SO**
Orogastric tube insertion	--	--	--	**SO**	**SO**

INTRAOSSEOUS ACCESS

BD-IO NEEDLE AND DRIVER

INDICATIONS

- Patient exhibits one or more of the following:
  - Respiratory compromise
  - Signs of shock - poor perfusion.
  - Cardiac arrest (medical or trauma)
  - Poor expected clinical outcome / patient in extremis

CONTRAINDICATIONS

- Known history of osteogenesis imperfecta or osteoporosis is a relative contraindication.

PRECAUTIONS / COMPLICATIONS

- Consider alternate site if any of the following exist:
  - Fracture of the bone selected for IO infusion.
  - Skin or soft tissue infection or burn at insertion site.
  - Excessive tissue at insertion site with the absence of anatomical landmarks.
  - Previous significant orthopedic procedures to include IO insertion within 24 hours
  - Prosthesis.
- If a rapid syringe bolus or Blood Pump flush of saline is not performed prior to infusion the IO will not likely flow.
- Insertion of the BD-IO in conscious patients does not require local anesthesia. IO infusion in conscious patients has been noted to cause severe discomfort. Use lidocaine (see below)

TECHNIQUE

- Locate appropriate insertion site
  - Proximal tibia – two finger widths breadth below the tuberosity on the anteromedial surface
  - The greater tubercle of the humeral head can also be used when either tibias cannot be used. Large adult (45mm) needle is recommended.
  - Distal tibia – 1-2 finger widths above the medial malleolus depending on age.
  - Distal Femur (NEONATES) - Secure the leg in the out-stretched position to ensure the knee does not bend. Identify the patella by palpation. The insertion site is just proximal to the patella (maximum 1cm) and approximately 1-2 cm **medial** to midline.
- Prepare insertion site using aseptic technique
- Stabilize site
- Attach appropriate needle set to driver and insert until needle enters marrow.
- Confirm placement
- Syringe bolus or Blood Pump flush the BD-IO catheter with normal saline.
- Pressure must be maintained via pressure infuser or IV pump for continuous infusion.
- Lidocaine may be used as analgesia in the conscious patient (refer to Lidocaine protocol).
- Examine site and dependent portion of the extremity for signs of infiltration.
- Secure IO needle and apply wristband to patient.
- If the initial IO attempt is unsuccessful, attempt again at another site. Do not use the same extremity more than once.

(CONTINUED)

INTRAOSSEOUS ACCESS

ADULT OR PEDIATRIC

PRODEDURE	EMT IV	AEMT	EMT I	EMTP	PCC
Respiratory compromise, signs of shock - poor perfusion, expected poor clinical outcome, cardiac arrest.	**SO (Patient in extremis)**	**SO**	**SO**	**SO**	**SO**

NASOTRACHEAL INTUBATION

INDICATIONS

- Same function as orotracheal intubation in patients greater than 12 years of age.
- Used in the breathing patient requiring intubation.
- In the trauma patient who is hypotensive making RSI contraindicated
- Asthma or pulmonary edema with respiratory failure, where intubation may need to be achieved in a sitting position
- In the setting of trauma with hemodynamic compromise secondary to blood loss and airway management is needed prior to transport.

CONTRAINDICATIONS

- Should not be attempted in children less than 12 years of age.
- The use of nasotracheal intubation is relatively contraindicated in patients with significant nasal or craniofacial trauma.
- Apnea

PRECAUTIONS / COMPLICATIONS

- Before performing BNTI, consider if the patient can be safely ventilated with non-invasive means such as CPAP or BVM
- Use caution in anticoagulated or bleeding disorders given the risk of epistaxis.
- Blind nasotracheal intubation is a very gentle technique. In the field, the secret of blind intubation is perfect positioning and patience.
- All the potential complications of orotracheal intubation plus:
  - Nasal bleeding caused by tube trauma
  - Vomiting and aspiration in the patient with intact gag reflex.
- With CFI available NTI is rarely the best choice for managing an airway, however, it is worth considering if you are in doubt about having success placing the tube successfully after paralytics, or if the patient is hemodynamically unstable making CFI contraindicated

TECHNIQUE

- Head must be exactly in midline for successful intubation.
- Have suction ready. Vomiting can occur, as with any stimulation of the airway.
- Often naris are asymmetrical and one side is much easier to intubate (usually the R naris). Avoid inducing bilateral nasal hemorrhage by forcing a nasotracheal tube on multiple attempts.
- Initiate BLS airway sequence and confirm ETCO2 production at this time.
- Suction airway and pre-oxygenate with BVM ventilations, if possible
- Check equipment, choose correct ETT size (usually 7.0 in adult, limit is size of naris)
- Position patient with head in midline, neutral position
- If trauma, cervical collar may be in place, or assistant may hold in-line stabilization in neutral position
- If no trauma, patient may be sitting upright
- Administer phenylephrine nasal spray in each nostril
- Insert 2% lidocaine jelly or other water-soluble lubricant to naris
- Lubricate ETT with lidocaine jelly or other water-soluble lubricant
- With gentle steady pressure, advance the tube through the nose to the posterior pharynx. Use the largest nostril. Abandon procedure if significant resistance is felt
- Keeping the curve of the tube exactly in midline, continue advancing slowly
- Adding EtCO2 to the tube prior to your intubation attempt can help you locate the glottic opening (rising EtCO2 indicates proximity to trachea)

(CONTINUED)

NASOTRACHEAL INTUBATION

- There will be slight resistance just before entering trachea. Wait for an inspiratory effort before final passage through cords. Listen for loss of breath sounds
- Placing your thumb over the end of the tube during inspiration will often cause the distal end of the tube to be drawn into the trachea
- Continue advancing tube until air is definitely exchanging through tube, then advance 2 cm more and inflate cuff
- Note tube depth and tape securely
- Confirm and document endotracheal location by:
  - Continuous waveform capnography
  - Presence and symmetry of breath sounds
  - Rising SpO2
- Ventilate with BVM. Assess adequacy of ventilations
- During transport, continually reassess ventilation, oxygenation and tube position with continuous waveform capnography and pulse oximetry

PROCEDURE	EMT B IV	AEMT	EMT I/99	EMTP	PCC
Nasotracheal Intubation	--	--	--	**SO**	**SO**

NEEDLE THORACOSTOMY FOR DECOMPRESSION OF TENSION PNEUMOTHORAX

INDICATIONS

- Tension pneumothorax is rare, but when present may rapidly lead to death and must be treated promptly.
- The following signs are significant. Not all may be present and may progress over time. Intervene quickly as some signs are late findings
  - **Severe Respiratory Distress – (Hypoxia that is associated with low ETCO2 value and a normal waveform)**
  - **Shock - low BP**
  - **Decreased or absent breath sounds on affected side to auscultation of chest**
  - **Consider bilateral needle chest decompression in traumatic pulseless arrest if patient is being resuscitated and any trauma to trunk**
  - Chest pain
  - Subcutaneous emphysema (air in the form of bubbles under the skin)
  - Tympanic percussion noted on affected side
  - Hyper expanded chest on affected side
  - Distended neck veins
  - If patient is intubated, increasing difficulty in bagging
  - Tracheal shift away from affected side (late finding)
- Because of the variability and the progression of findings, the items in bold are the main findings to look for. If all of these are present, proceed with the decompression.
- If the patient is in cardiac arrest after a traumatic injury to the chest, needle decompression is indicated on one or both sides.

PRECAUTIONS / COMPLICATIONS

- Pneumothorax is relatively common, is **NOT** immediately life threatening, and should not be treated in the field.
- Tension pneumothorax is a rare condition, but can occur both with trauma and more rarely spontaneously. It can also occur as a complication of CPR.
- Treatment of tension pneumothorax is not difficult, although complications of the procedure can be severe, diagnosis must be accurate and is not always easy, accurate diagnosis is paramount.
- Note that simple pneumothorax can progress to a tension pneumothorax be vigilant.
- Non-traumatic sudden onset of chest pain and shortness of breath in a normal individual may also be caused by a spontaneous pneumothorax (particularly in patients with COPD or asthma). These can also progress to a "tension" state.
- Tension pneumothorax can be precipitated by occlusion of an open chest wound with a dressing. If, after dressing an open chest wound, the patient deteriorates, remove the dressing, release air and reapply leaving one side open for exhalation.
- Creation of pneumothorax if none existed previously
- Laceration of blood vessels; intercostal vessels run in grove under each rib
- Severe pain: if you're doing this in the field, patient should be sick enough not to require anesthesia.
- Infection: clean rapidly but vigorously. Use sterile gloves, if possible.

(CONTINUED)

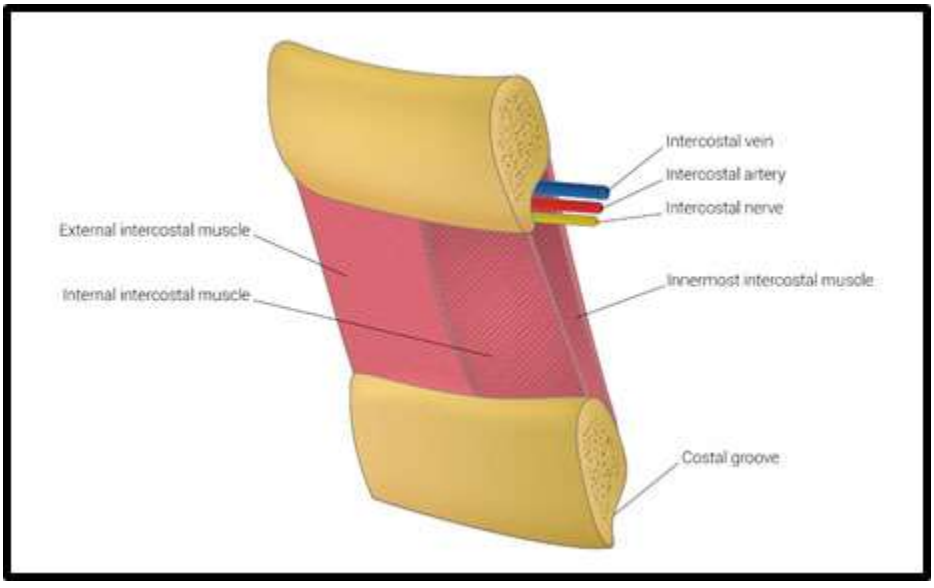
NEEDLE THORACOSTOMY FOR DECOMPRESSION OF TENSION PNEUMOTHORAX

TECHNIQUE

- Decompress using one of the needle technique
  - Expose entire chest. Clean chest vigorously with available skin prep
  - Insert Chest decompression needle either at the 2nd intercostal space at the midclavicular line, or the 5th intercostal space at the midaxillary line.
    - For adults, use the 10 G catheter in the decompression kit, for children a shorter angiocath is appropriate (16 or 18 G) **if using a standard angiocath a syringe MUST be attached to open the valve allowing release of air**
    - Either approach is acceptable, generally the site with the least soft tissue overlying the ribs is preferred.
  - Apply chest seal over catheter to create a one-way valve. Be sure the adhesive is applied to cleaned skin.
- Repeat procedure if initial needle becomes clogged or if signs of tension pneumothorax progress despite initial decompression.

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Needle Thoracostomy	--	--	**SO**	**SO**	**SO**

Intercostal vessel and nerve locations



Ensure you slide catheter over the TOP of the rib to avoid damage to these structures

ORAL ENDOTRACHEAL INTUBATION

INDICATIONS

- Respiratory Failure/Arrest
- Absence of protective airway reflexes
- Present or impending complete airway obstruction

CONTRAINDICATIONS

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

PRECAUTIONS

- Hypoxia due to prolonged intubation attempt
- Ventricular arrhythmias or fibrillation in hypothermia patients from stimulation of airway
- Limit Orotracheal intubation attempts to **TWO PER PATIENT** (not per provider), after which adjunct airway device or BVM should be used.
- Ventilate at age-appropriate rates. Do not hyperventilate
- Reconfirm and document correct tube position, preferably with waveform capnography, after moving patient and before disconnecting from monitor in ED
- Unsuccessful intubation does not equal failed airway management. Many patients cannot be intubated without paralytics. Abandon further attempts at intubation and use supraglottic airway or BVM ventilations if 2 attempts at intubation unsuccessful

TECHNIQUE

Prepare Equipment

- BVM with PEEP valve, HEPA filter, O_two timing light and EtCO2 in place
- Laryngoscope and handle checked for proper function
- Appropriately sized ETT loaded with stylet or bougie
    - Consider having one size larger and one size smaller than anticipated tube size at hand
- 10 cc syringe
- Bougie
- Ducanto suction catheter and suction device
- Tube holder or tie
- Appropriately sized I-gel
- Cricothyrotomy kit
- C-collar
- NG/OG tube with Toomy syringe

(CONTINUED)

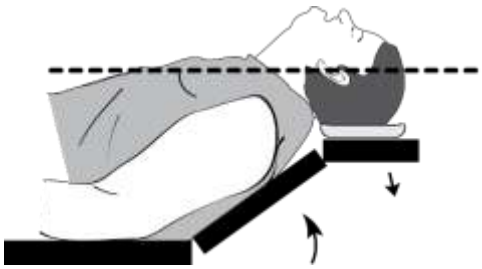
ORAL ENDOTRACHEAL INTUBATION

Prepare Yourself and the Team

- Verbalize missed airway plan to all members of the team
- Identify, palpate and mark surgical landmarks
- Delegate roles and responsibilities
- Assess for difficult BVM ventilation
  - BOOTS (Beard, Obese, Older, Toothless, Sounds (snoring, stridor, wheezing))
- Assess for difficult intubation
  - LEMON – (Look external, Evaluate 3,3,2, Mallampati, Obstruction, Neck Mobility)
- Assess for difficult supraglottic device placement
  - RODS – (Restricted mouth opening, Obstruction of upper airway, Distortion/disruption of the airway, stiff lungs (reduced compliance or increased resistance)

PREOXYGENATION

- Place OPA
- Position patient "heads up" – 25-30° incline, ears to sternal notch – face parallel to the ceiling for DL, head in neutral position for VL



- Perform two handed "thumbs down" mask seal with PEEP set to at least 5 cmH2O

INTUBATE

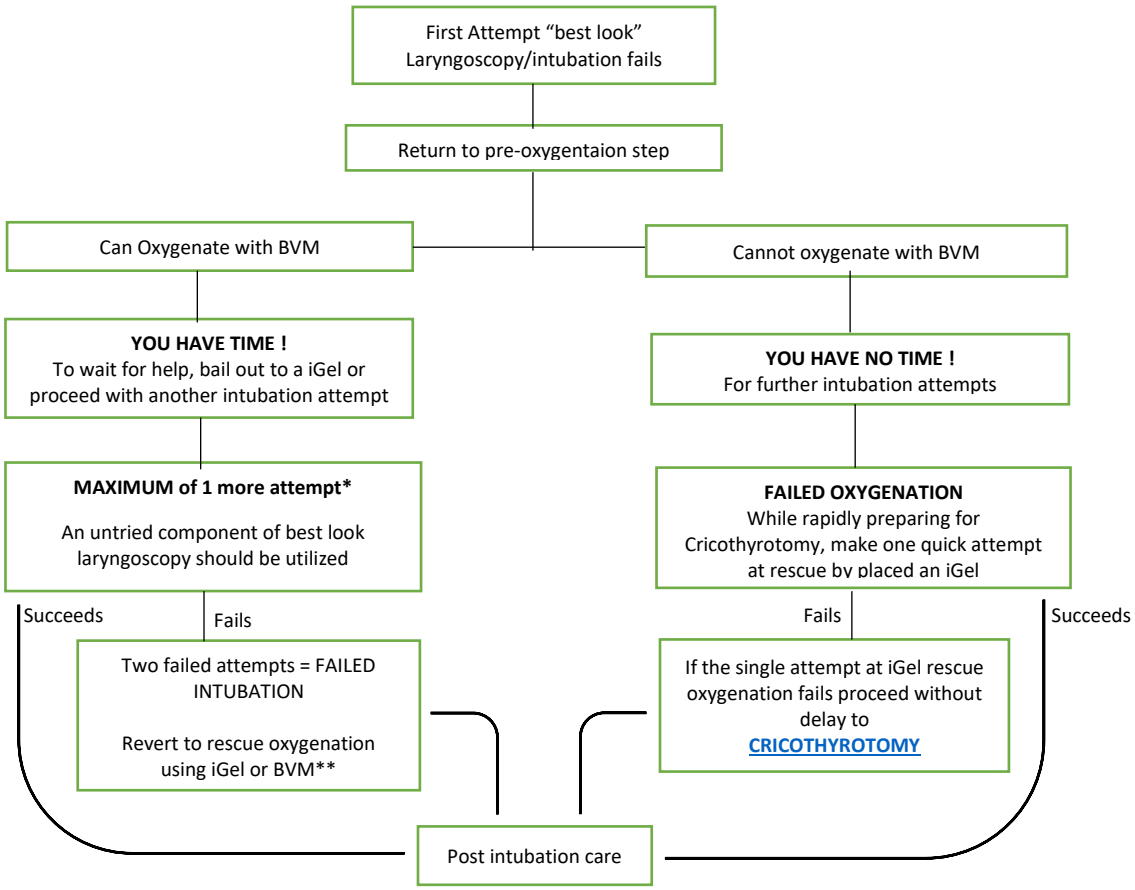
- Insert Ducanto catheter and perform S.A.L.A.D maneuver
- Suction prior to and throughout the intubation attempt
- Have assistant ready to help manipulate laryngeal positioning
  - Place the assistant's fingers and lead medic manipulates them to allow for best view – assistant then holds position of best view
- Perform endotracheal intubation
- Confirm ET tube placement:
  - ETCO2 capnography is the primary confirmation measure.
    - Waveform capnography is **MANDATORY** for confirmation of **ALL advanced airway placements**
  - Positive bilateral breath sounds
  - Negative epigastric sounds
  - Chest rise
  - Patient response including color, pulse-oximetry
- If first attempt is unsuccessful – go to failed airway algorithm (below)
- Secure and note position of tube. Monitor with continuous capnography.

(CONTINUED)

ORAL ENDOTRACHEAL INTUBATION

- If ETCO2 rises, SpO2 declines, or bagging becomes difficult, consider the following causes and treat these conditions as they are found.
  - Dislodged or displaced ET tube.
  - Tube obstruction such as by clot or edema fluid.
  - Tension pneumothorax.
  - Worsening lung conditions such as wheezes or rales.
- Place OG/NG tube
- Apply C-Collar to help restrict head movement and displacement of the tube during transfer

Failed Airway Algorithm



* A second attempt at intubation may be made. An untried component of intubation should be used. Switching from VL to DL or vice versa, use of bougie, different tube size, different blade size etc.

** Carefully consider whether injury or swelling may make later intubation possible before reverting to iGel or BVM ventilation – if you are suspicious that airway will worsen consider moving to Cricothyrotomy instead

PROCEDURE	EMT-IV	AEMT	EMT I/99	EMTP	PCC
Orotracheal Intubation	--	--	SO	SO	SO

PEDIATRIC NEEDLE CRICOTHYROTOMY

Introduction:

- Needle cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances as defined below. The rationale for this procedure must be documented in the patient care report and submitted for review to the EMS Medical Director within 24 hours.
- Due to the funnel-shaped, rostral, highly compliant larynx of a pediatric patient, cricothyrotomy is an extremely difficult procedure to successfully perform. As such, every effort should be made to effectively oxygenate the patient before attempting needle cricothyrotomy.
- A standardized, pre-prepared kit is located in the pediatric intubation bag, and can be assembled using common airway equipment (3 cc syringe and ETT tube adapter from an 8.5 ETT)

Indications:

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

Contraindications:

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

Technique:

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

PRECAUTION:

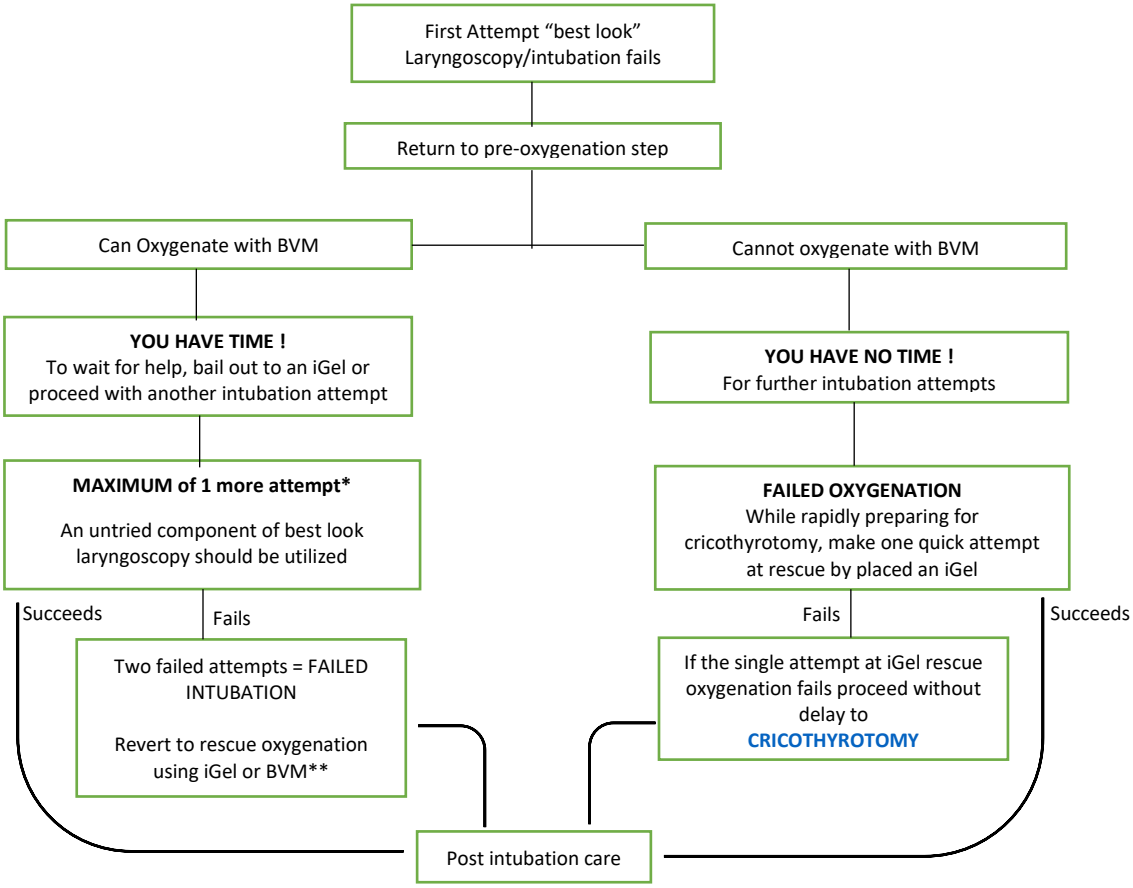
- Due to the very limited ability for exhalation, the possibility of air trapping/pressure stacking is common. Monitor for this condition and be prepared to manually compress the chest to assist with exhalation

RESCUE AIRWAY

INDICATIONS

- To provide adequate ventilation to an apneic patient.

Failed Airway Algorithm



* A second attempt at intubation may be made. An untried component of intubation should be used. Switching from VL to DL or vice versa, use of bougie, different tube size, different blade size etc.

** Carefully consider whether injury or swelling may make later intubation possible before reverting to iGel or BVM ventilation – if you are suspicious that airway will worsen consider moving to cricothyrotomy instead

(CONTINUED)

RESCUE AIRWAY

PRECAUTIONS

- If attempts to perform endotracheal intubation are unsuccessful, use of these rescue airways should be considered. All providers have a standing order to proceed with the use of these devices, within their scope of practice (see below), when initial attempts to perform endotracheal intubation are unsuccessful or they may be used initially if the patient's airway appears to be difficult due to anatomy or airway trauma.
- With each attempt of endotracheal intubation, edema and potential trauma and bleeding will make the next attempt more difficult. If another medic (ALS) is present that has experience with airway management, have him or her attempt if you have attempted with no success. It may be wise to use one of these adjunct airway devices initially if indicated (see above). Bag-valve mask is just as viable an option in those in whom an adequate seal can be made and in whom obstruction is not present. The decision of using a rescue airway vs. using the bag-valve mask must be made in light of transport time.

i-Gel Supraglottic Airway

PREPARATION

- Choose the correct size of tube according to the patient's weight:
  - Neonate 2-5kg: Size 1 (pink)
  - Infant 5/12kg: Size 1.5 (light blue)
  - Small Pediatric 10-25kg: Size 2 (Grey)
  - Large Pediatric 25-35kg: Size 2.5 (white)
  - Small Adult 30-60kg: Size 3over 6 feet: Size 3 (yellow)
  - Medium Adult 50-90kg: Size 4 (green)
  - Large Adult 90+ kg: Size 5 (orange)
- Remove the i-Gel and transfer it to the palm of the same hand that is holding the protective cradle.
- Place a small bolus of a water based lubricant, such as K-Y Jelly, onto the middle of the smooth surface of the protective cradle in preparation for lubrication.
- Grasp the i-Gel along the integral bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant.
- Place the i-Gel back into the protective cradle in preparation for insertion.
- Suction airway and maximize oxygenation with BVM ventilations

INSERTION

- Grasp the lubricated i-Gel firmly along the integral bite block. Position the device so that the i-Gel cuff outlet is facing towards the chin of the patient. The patient should be in the 'sniffing' position with head extended and neck flexed. The chin should be gently pressed down before proceeding. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
- Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
- The tip of the airway should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integral bite-block.
- If there is early resistance during insertion a 'jaw thrust' (above) or 'Insertion with Deep Rotation' (right) is recommended.
- i-Gel should be taped down from 'maxilla to maxilla'.

(CONTINUED)

RESCUE AIRWAY

Surgical Cricothyrotomy

- Reserved as a last resort in patients for whom bag valve mask is unsuccessful.
- Contraindicated for patients with direct trauma to the cricoid cartilage or larynx including retraction of the trachea after transection.
- Surgical technique only for age>8
- Refer to *1220 Surgical Cricothyrotomy protocol* *or* *1160 Pediatric Needle Cricothyrotomy* for specific instructions for each

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
i-Gel all sizes	**SO**	**SO**	**SO**	**SO**	**SO**
Endotracheal Intubation • Oral • Nasal	--	--	**SO** --	**SO**	**SO** **SO**
Surgical Cricothyrotomy	--	--	--	**SO**	**SO**
Pediatric Needle Cricothyrotomy	--	--	--	**SO**	**SO**

SPINAL MOTION RESTRICTION

APPROACH

- The decision to apply spinal motion restriction (SMR) should be based on assessment findings. While mechanism of injury is a consideration, ultimately the decision should be made on objective physical exam findings.
- The goal of SMR in the trauma patient is to minimize unwanted movement of the potentially injured spine. SMR may be achieved by several means based on patient condition, location, etc. in conjunction with a properly fitted c-collar, these include the ambulance stretcher, a vacuum mattress, or scoop stretcher. Tools such as the KED or back-board should be considered extrication devices and the time the patient is on these should be kept to a minimum. This practice is supported by both the National Association of EMS Physicians and the American College of Surgeons in their 2013 joint position statement (EMS Spinal Precautions and the Use of the Long Backboard. PEC 2013; 17:392-393).

INDICATIONS

- Positive NEXUS findings following blunt trauma that indicate the need for SMR:
  - Altered mental status (intoxicated, GCS<15)
  - Midline C/T/L spine tenderness on palpation
  - Barriers to evaluate for spinal injury (e.g. language or developmental barriers)
  - Neurological complaints or deficits. This includes sensory changes, weakness.
  - Distracting injury
  - Age: > 65 or < 5 with significant mechanism
- Consider spinal motion restriction for patients with high risk mechanism.
- In penetrating trauma, SMR is not indicated unless patient has neurological deficits.

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

If **ANY** of the criteria are **NOT** met, **OR** you suspect the patient has a spinal injury – apply properly sized C-Collar and instruct the patient not to move their neck.

- If there is an objective neurologic deficit, or the patient has been non ambulatory prior to arrival and they are able to lay still and comply with instructions initiate full SMR using preferred device at your discretion.
- If the patient has been ambulatory on scene or they are not able to lay still and comply with instructions transport the patient in a position of comfort with an appropriately sized C-Collar on the stretcher is appropriate.

CONSIDERATIONS

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

(CONTINUED)

SPINAL MOTION RESTRICTION

PEDIATRIC CONSIDERATIONS

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

PRECAUTIONS / COMPLICATIONS

- If the patient complains of nausea or is obtunded, be prepared to rotate the patient in the event that vomiting occurs. Start anti-emetics immediately on such patients.
- If the patient is combative despite chemical restraints or the cervical collar does not fit adequately, other methods of immobilizing the spine are acceptable (towel rolls, etc.).
- Refer to 4080 Spinal Trauma Protocol for treatment of suspected spinal cord injury.
- Carefully consider SMR options in patients with special considerations such as pregnancy, respiratory distress, or bariatric.
- If using the vacuum mattress it is, generally speaking, better to utilize the scoop to move the patient onto the mattress than to try and roll them onto it. The scoop can then be removed after the patient has been placed on the vacuum mattress and positioned properly.

Helmets

- Football
  - Do not remove helmet or shoulder pads prior to EMS transport unless they are interfering with the management of acute life-threatening injuries.
  - Helmet and pads should treated as one unit, if one has to be removed – both should. Football helmets are designed to maintain neutral alignment when worn with pads. Football helmets are also designed to be radio opaque, as such the facemask should be removed, but the helmet left in place.
    - All athletic equipment is not the same, athletic trainers on scene should be familiar with the equipment in use and be able to remove facemask prior to, or immediately upon, EMS arrival.
- Motorcycle
  - Motorcycle helmets will not maintain neutral alignment of the spine when the patient is supine and should therefore be removed if at all safe to do. If not, the SMR device should be padded to a degree that allows for neutral alignment.

SPLINTING: EXTREMITY

INDICATIONS

- Pain, tenderness, swelling, or deformity in extremity which may be due to fracture or dislocation
- In an unstable extremity injury: to reduce pain; limit bleeding at the site of injury; and prevent further injury to soft tissues, blood vessels or nerves

PRECAUTIONS / COMPLICATIONS

- Critically injured trauma victims should not be delayed in transport by lengthy evaluation of possible non-critical extremity injuries. Prevention of further damage may be accomplished by securing the patient to stretcher when other injuries demand prompt hospital treatment.
- The patient with altered level of consciousness from head injury or drug/alcohol influences should be carefully examined and conservatively treated, because his ability to recognize pain and injury is impaired.
- Make sure the obvious injury is also the only one. It is particularly easy to miss fractures proximal to the most visible one.

TECHNIQUE

- In a stable patient where no environmental hazard exists, splinting should be done prior to moving the patient.
- Check pulse, capillary refill, and sensation distally prior to movement or splinting. Document findings in narrative.
- In the stable patient where time is not of the essence consider pain medications prior to realigning or splinting the extremity
- IF DISTAL PULSES ARE ABSENT; Reduce angulated fractures, including open fractures, with gentle axial traction as needed to immobilize properly.
- Remove bracelets, watches, or other constricting bands prior to splint application.
- Identify and dress open wounds. Note wounds that contain exposed bone or are near fracture sites and may communicate with a fracture.
- To minimize pain and soft tissue damage, avoid sudden or unnecessary movement of fracture site.
- Choose splint to immobilize the joint above and below injury. Pad rigid splints to prevent pressure injury to extremity.
- Apply gentle continuous traction to extremity and support to fracture site during splinting operation.
- Check distal pulses, capillary refill, and sensation after reduction splinting. Realign gently if adequate circulation or sensation is lost.

PRODEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Extremity Splint	**SO**	**SO**	**SO**	**SO**	**SO**
Reducing a Fracture • Attempt once if pulses are absent • Contact medical control if unsuccessful	**SO**	**SO**	**SO**	**SO**	**SO**

SPLINTING: PELVIS

The pelvis is a ring of bones that function to bear weight, protect major blood vessels and organs, and acts as an attachment point for several bones and muscles. As such, any impact that may cause a pelvic fracture can lead to significant bleeding and organ damage.

The current best practice for stabilization of a suspected pelvic fracture in the field is the application of a pelvic splint. This aids in reduction of blood loss and increased patient comfort during transport.

INDICATIONS

- Pain, tenderness, unstable pelvis on exam.
- Have a high suspicion for pelvic fracture in patients that have sustained significant mechanism of injury; including but not limited to MVC, MCA, auto-ped, skier vs tree, falls from height, blast injuries, and GSW.

PRECAUTIONS / COMPLICATIONS

- Because of the high amount of force required to fracture the pelvis, the patient is likely to have other major traumatic injuries. Be prepared to treat such and expect onset of hypovolemic hemodynamic changes.
- **Neither** the Pelvic binder nor Sheet splinting is indicated for suspected hip fractures – using either of these types of splinting can cause more damage to injured areas

TECHNIQUE

- Follow manufacturer's guidelines for any specific commercial splint application.
- Remove clothing, time and patient condition allowing. If not, remove items from pockets of pants.
- Pass splint under legs and slide up until splint lays across the line of the greater trochanter (where femoral head joins pelvis) and symphysis pubis.
- Tighten to manufacturer's specifications or use best judgment if using sheets as binder.
  - Avoid over-tightening as this may lead to significant complications.
- Treat pain per protocol

PRODEDURE	EMT IV	AEMT	EMT I-99	EMTP	CCP
Pelvic Binder	**SO**	**SO**	**SO**	**SO**	**SO**

SPLINTING – TRACTION

INDICATIONS

- Fracture located in the upper two thirds of the femoral shaft.

CONTRAINDICATIONS

- Fractures close to or involving the knee
  - o May cause injury to the popliteal vessels superior to the knee
- Supracondylar fractures of the distal end of the femur are contraindicated because traction can cause anterior rotation of the distal bone fragment; forcing the sharp fractured bone end down into the popliteal artery and nerve.
- Suspected open fractures (relative contraindication)
- Suspected pelvic fractures

PRECAUTIONS / COMPLICATIONS

- Tissue damage from bone ends if the traction is interrupted.
- Hypoperfusion of the foot from the constriction of the ankle strap

TECHNIQUE

- Examine the pelvis, leg, ankle, and foot for other fractures.
- Assess distal circulation.
- The Slishman Traction Splint (STS) is the current traction splint in use by our department. Use the following steps as a guide for placement on both Peds and Adults.

1. Attach Ankle Strap
   • Remove ankle strap and end cap from pole
   • Unroll ankle strap and apply with end cap lateral and facing up to receive splint pole • Secure with Velcro wrap
2. Attach Groin Strap
   • Rest female buckle on anterior thigh
   • Wrap male buckle and strap behind thigh
   • Snap male to female buckle and tighten
3. Apply Coarse Traction
   • Extend distal pole after releasing thumb screw on black pole clamp
   • Insert distal pole into ankle strap end cap
   • After achieving desired length, tighten thumb screw
4. Apply Fine Traction
   • Release thumb screw on red pole clamp
   • Pull cord to apply desired traction
   • Tighten thumb screw on red pole clamp and release cord
5. Reassess and Monitor
   • Reassess CMS and pain level
   • Adjust traction as needed to minimize pain, while maintaining perfusion
   • For rotational stability attach mid leg strap to splint and wrap (one or both legs) below knee

NOTE ON PEDIATRIC PATIENTS

For patients under 44 inches in height and/or 3 years or less in age, lengthen the groin strap allowing the splint to rest more proximal to the hip.

ADULT and PEDIATRIC

PRODEDURE	EMT-IV	AEMT	EMT I/99	EMTP	CCP
Traction Splint	**SO**	**SO**	**SO**	**SO**	**SO**

BOUGIE ASSISTED SURGICAL CRICOTHYROTOMY

INTRODUCTION:

- Surgical cricothyrotomy is a difficult and hazardous procedure that is to be used only in extraordinary circumstances as defined below. The reason for performing this procedure must be documented and submitted for review to the EMS Medical Director within 24 hours.
- An endotracheal tube introducer ("bougie") facilitates this procedure and has the advantage of additional confirmation of tube position and ease of endotracheal tube placement. If no bougie is available, the procedure may be performed without a bougie by introducing endotracheal tube or tracheostomy tube directly into cricothyroid membrane.
- Given the rarity and relative unfamiliarity of this procedure it may be helpful to have a medical consult on the phone during the procedure. Consider contacting base for all cricothyrotomy procedures.

INDICATIONS:

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

CONTRAINDICATIONS:

- Surgical cricothyrotomy is contraindicated in patients less than 12 years of age for anatomic reasons.
- Not to be performed on patients where anatomical landmarks cannot be distinguished

PRECAUTIONS / COMPLICATIONS:

- Surgical cricothyrotomy is an advanced lifesaving airway skill that should be only used on patients who will die without airway management.
- Aspiration
- Hemorrhage
- Posterior tracheal wall perforation
- Thyroid gland perforation
- Esophageal laceration
- Vocal cord injury

Technique:

1. Position the patient supine, with in-line spinal motion restriction if indicated. If cervical spine injury not suspected, neck extension will improve anatomic view.
2. Clean skin per agency approved aseptic technique.
3. Stabilize the larynx with the thumb and middle finger of your non dominant hand, and identify the cricothyroid membrane with your index finger, typically 4 fingerbreadths below mandible
4. Using a surgical marker mark the area where the incision is to be made.
5. Using a scalpel, make a 3 cm centimeter vertical incision 0.5 cm deep through the skin and fascia, over the cricothyroid membrane. With finger, dissect the tissue and locate the cricothyroid membrane.
6. Make a horizontal incision through the cricothyroid membrane with the scalpel blade oriented caudal and away from the cords.
7. Place the hook into the opening and keep it in place- use an assistant if available
8. Invert the scalpel so that the handle is in the incision and turn the scalpel to enlarge the opening.
9. You may also use finger to enlarge the opening

(Continued)

BOUGIE ASSISTED SURGICAL CRICOTHYROTOMY

10. Insert the bougie curved-tip first through the incision and angled towards the patient's feet guided by the finger.
    a. If no bougie available, use tracheal hook instrument to lift caudal edge of incision to facilitate visualization and introduction of ETT directly into trachea and skip to # 12.
11. Advance the bougie into the trachea feeling for "clicks" of tracheal rings and until "hang-up" when it cannot be advanced any further. This confirms tracheal position.
12. Advance a 6-0 endotracheal tube over the bougie and into the trachea. It is very easy to place tube in right main-stem bronchus, so carefully assess for symmetry of breath sounds. Remove bougie while stabilizing ETT ensuring it does not become dislodged
13. Ventilate with BVM and 100% oxygen
14. Confirm and document tracheal tube placement as with all advanced airways: Waveform capnography as well as clinical indicators e.g.: symmetry of breath sounds, rising pulse oximetry, etc.
15. Secure tube with ties.
16. Observe for subcutaneous air, which may indicate tracheal injury or extra- tracheal tube position
17. 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

PROCEDURE	EMT IV	AEMT	EMT - I	EMTP	PCC
Bougie Assisted Surgical Cricothyrotomy	--	--	--	**SO**	**SO**

TASER ® PROBE REMOVAL

Indications

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

Contraindications

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

Technique

- Be alert for any medical conditions which may ensue following physical struggle. See 2030 agitate/combative protocol for appropriate assessment and treatment.
- Confirm the TASER® has been shut off and the barb cartridge has been disconnected.
- Using a pair of shears cut the TASER® wires at the base of the probe.
- 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.
- 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.
- Repeat the process for any additional probes.
- 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.
- Advise patient to watch for signs of infection including increased pain at the site, redness swelling or fever.

PRODEDURE	EMT-IV	AEMT	EMT I/99	EMTP	CCP
Taser Probe Removal	**SO**	**SO**	**SO**	**SO**	**SO**

Simple Thoracostomy for Traumatic Arrest

APPROVAL

P | P-CC

- Waivered act for paramedics and critical care paramedics.
- Standing order in all settings.

INDICATIONS

- ***Traumatic cardiac arrest*** with suspicion for possible traumatic pneumothorax or hemothorax.

CONTRAINDICATIONS

- Patient less than 13 years old.
- Obviously nonsurvivable injury, where needlestick exposure risk outweighs possible benefit.

POSSIBLE COMPLICATIONS

- Needlestick exposure from splintered rib.
- Puncturing too inferiorly into peritoneal cavity.
- Puncturing too deeply/aggressively causing cardiac or lung injury.

PROCEDURAL TECHNIQUE

- Quickly **sterilize site** and don **sterile gloves**.
- Position patient—Supine, arm extended over head.
- Identify landmarks—4th intercostal space in midaxillary line.
    - ◊ "Triangle of Safety" is above nipple line, between pectoralis and latissimus muscles.
- Incise the skin with a **scalpel** along the contour of the rib, approximately 4 cm.
- Hold **hemostats** by the shaft (NOT the handles) to avoid penetrating too deeply.
- Apply pressure until there is blunt penetration through the pleura.
- While in the pleural space, open the hemostats and forcibly withdraw, to widen the opening.
- **OPTIONAL:** Insert your gloved finger into the hole to ensure decompression of pleural space.
- Apply an **occlusive dressing** (chest seal).
- If there is not obvious decompression, consider repeating the procedure immediately on the contralateral side.
- If pulses are regained, expect the need for positive pressure ventilation, and monitor for recurrent tension physiology, which could require repeating the procedure.

REQUIRED DOCUMENTATION/MONITORING

As soon as clinically feasible and appropriate:

- Cardiac monitoring
- Systolic blood pressure
- Heart rate
- Pulse oximetry
- Respiratory rate
- End tidal CO2

TOURNIQUET

INDICATIONS:

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

PRECAUTIONS:

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

TECHNIQUE:

- First, attempt to control hemorrhage by using direct pressure over bleeding area.
- If a discrete bleeding vessel can be identified, point pressure over bleeding vessel is more effective than a large bandage and diffuse pressure.
- If unable to control hemorrhage using direct pressure, apply tourniquet according to manufacturer specifications and using the steps below:
- Cut away any clothing so that the tourniquet will be clearly visible. NEVER obscure a tourniquet with clothing or bandages.
- Apply tourniquet proximal to the wound 2-3" above the bleeding site directly to the skin and not across any joints.
- Tighten tourniquet until bleeding stops. You should not feel distal pulses when adequately tightened.
- Check for bleeding and distal pulse. If bleeding is not controlled or distal pulse is present, consider additional tightening or applying second tourniquet above and next to the first. Reassess.
- If bleeding is not controlled with the application of a single tourniquet, a 2nd can be applied adjacent to the 1st.
- Mark the time and date of application on the patient's skin next to the tourniquet.
- Keep tourniquet on throughout hospital transport – a correctly applied tourniquet should only be removed by the receiving hospital.
- Tourniquets can be excruciatingly painful in themselves; actively manage pain per protocol.

- **NOTE: Extremity injuries can be distracting and may draw your attention away from more serious internal injuries or shock. Once hemorrhage is controlled, do thorough patient assessment and treat for shock and bleeding accordingly.**

PRODEDURE	EMT-IV	AEMT	EMT I/99	EMTP	CCP
Tourniquet Application	**SO**	**SO**	**SO**	**SO**	**SO**

TRANSCUTANEOUS CARDIAC PACING

INDICATIONS

- To maintain adequate perfusion during episodes of symptomatic bradycardia that has not improved with adequate oxygenation, ventilation, and medications such as atropine.
    - The most reliable objective indication of poor perfusion is an EtCO2 value <35cmH2O
- First line treatment for high-degree AV block (type II 2nd degree or 3rd degree AV nodal block)

PRECAUTIONS / COMPLICATIONS

- Mechanical capture can be difficult in some patients
    - Muscle tremors may complicate evaluation of pulses
        - Sudden rise in EtCO2 reading during pacing is a reliable indicator of mechanical capture
        - Organized heart sounds at a rate consistent with pacing rate is also a reliable indicator of mechanical capture
- Patient may experience discomfort; consider midazolam, if blood pressure allows (See 6270 Midazolam Protocol)
- V-fib and V-tach are rare complications, but follow appropriate protocols if either occur
- Pacing is rarely indicated in patients under the age of 12 years
- Pacing may cause diaphragmatic stimulation and apparent hiccups

TECHNIQUE

- Apply electrodes as per manufacturer specifications: (-) right anterior, (+) left lateral.
- Turn Lifepack 15 on
- Apply 4 lead electrodes and cables
- Press pacer to turn pacer function on
- Confirm that the Lifepack 15 is sensing the patient's spontaneous QRS complexes. This can be confirmed by a triangle marker above each QRS complex. If not, increase size until the Lifepack 15 does sense the spontaneous QRS complex. Failure of getting the monitor to sense the QRS complexes may cause the pacer may discharge on an existing complex.
- Select pacing rate at 80 beats per minute (BPB)
- Set initial current to 40 mAmps.
- Increase current 10 mAmps every 5-10 seconds until mechanical capture or 200 mAmps (usually captures around 100 mAmps)
- After mechanical capture is obtained, increase amperage by 10 mAmps.
- If no capture occurs with maximum output, discontinue pacing and resume ACLS.

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Transcutaneous Pacing	--	--	**SO**	**SO**	**SO**

VASCULAR ACCESS

PERIPHERAL

INDICATIONS

- Administer fluids for volume expansion
- Administer drugs

PRECAUTIONS / COMPLICATIONS

- Due to the uncontrolled environment in which prehospital IVs are started, take extra care to use aseptic technique.
- Pyrogenic reactions due to contaminated fluids become evident in about 30 min after starting the IV. Patient will develop fever, chills, nausea, vomiting, headache, backache, or general malaise. If observed, stop and remove IV immediately. Save the solution so it may be cultured.
- Local: hematoma formation, infection, thrombosis, phlebitis. Note: the incidence of phlebitis is particularly high in the leg. Avoid use of lower extremity if possible.
- Systemic: sepsis, pulmonary embolus, catheter fragment embolus, fiber embolus from solution in IV
- Sites that are over a bone and away from a joint are more stable allow full range of motion of the limb
- The point between the junction of two veins is more stable and often easier to use.
- Start distally, and if successive attempts are necessary, you will be able to make more proximal attempts on the same vein without extravasation of IV fluid.
- Venipuncture has little morbidity; however, the excess fluids inadvertently run in when nobody is watching can harm to the patient: Monitor fluid input carefully.
- The most difficult problem with IV insertion is knowing when to try and when to stop trying. Valuable time is often wasted attempting IVs when a critical patient requires blood. IV solutions may "buy time," but they frequently lose time instead. In critical patients do not delay transport while attempting IV insertion at the scene. Establish IO access if the patient is critical.

CONTRAINDICATIONS

- Do not start IVs distal to a fracture site or through skin damage with more than erythema or superficial abrasion.

TECHNIQUE

- Inspect fluid bag for clarity, leakage, and expiration date.
- Connect tubing to IV solution bag.
- Fill drip chamber one-half full by squeezing.
- Prepare supplies
  - Veniguard
  - Alcohol swab
  - Select catheter size, or sizes
  - Tourniquet
  - Blood draw bag
  - J-loop
- Gloves are mandatory, consider eyewear and mask
- Cleanse insertion site with alcohol
- If necessary to palpate after cleanse, cleanse tip of gloved finger first.

(CONTINUED)

VASCULAR ACCESS

- Perform venipuncture
- After the catheter is in place, remove the needle or stylette
- Attach tubing or saline lock
- Open full to check flow and placement, then adjust to indicated rate (*see 6200 IV solution protocol*)
- Secure with Veniguard
- *Recheck* to be sure IV rate is as desired.
- **If you are unable to start an IV after 2 attempts consider Intraosseous Access (*see* 1120 Intraosseous protocol)**

EXTERNAL JUGLAR VEIN

INDICATIONS

- Inability to secure extremity IV access

TECHNIQUE

- Position the patient: supine, head down (this may not be necessary or desirable if congestive heart failure or respiratory distress present). Turn patient's head opposite side of procedure.
- Align the cannula in the direction of the vein, with the point aimed toward the ipsilateral shoulder (on the same side).
- "Tourniquet" the vein lightly with one finger above the clavicle and apply traction to the skin above the angle of the jaw.
- Make puncture midway between the angle of the jaw and the midclavicular line
- Puncture the skin with the bevel of the needle upward; enter the vein either from the side or from above.
- Note that you may not get blood return due to low venous pressure; flush carefully if you believe your catheter is in and watch for extravasation

ADULT

PRODEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
• External Jugular Vein	--	SO	SO	SO	SO

ADULT and PEDIATRIC

PRODEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
• Peripheral IV	SO	SO	SO	SO	SO

O-TWO e700 VENTILATOR MANAGEMENT: INTUBATED PATIENT

INDICATIONS:

- Efficient and safe ventilatory management of the intubated and sedated patient.
- The following are initial considerations for ventilator setup and management. Every patient is distinctive and requires a unique combination of settings, medications, and treatments based on assessment, lab values, and history. Patient care should reflect EMS ventilatory best practices as outlined in current literature and trainings.

O-TWO VENT:

- Be sure to use a ***Ventilator Care Record*** **ANYTIME** the vent is used.
- The vent should be running on the Test Lung prior to hooking up the ventilator to the patient.
- All adjustments should be made while the vent is connected to the Test Lung after all settings are made and adjusted for the patient, then the patient can be connected to the vent.
- Place the patient on in-line EtCO2 and vent as soon as possible. User should pay attention to ventilator synchrony in order to adequately manage ventilations.
- Use appropriate default setting (infant, child, adult) to get the patient ventilated immediately. Connect patient to vent circuit. Once on, measure patient to determine ideal body weight (IBW) and change tidal volume accordingly. There is a laminated card attached to each ventilator to give you ideal body weight and tidal volumes in mL/kg based on patient height. In case the card is missing the formula below is used to calculate IBW.

Males: **PBW = 50 kg + 2.3 kg for each inch over 5 feet (60 in)**
Females: **PBW = 45.5 kg + 2.3 kg for each inch over 5 feet (60 in)**

MODES:

- Choosing the correct mode can ensure adequate ventilation and assist with patient comfort during the process. In both modes, it is paramount that you ensure patient is adequately sedated and their pain is managed.
  - **AC**: In this mode every breath whether initiated by the patient or by the vent, will be given at the full volume up to the pressure limitation set by the alarm limit.
    - Generally the preferred initial setting. Good setting for well sedated patients who would benefit from ventilator driven inhalation allowing respiratory muscles to rest.
  - **SIMV**: In this mode, only the ventilator initiated breaths will receive the set tidal volume up until the pressure limitation set by the alarm limit is met. Spontaneous breaths will draw what the patient can pull and not be assisted by the ventilator unless PSV is set.
    - Generally more comfortable for patients that you are having difficulty in getting adequate sedation. May be beneficial in avoiding hyperventilation or breath stacking.
  - **BiLVL**: Similar to SIMV but respirations are driven by pressure settings. Typically used for spontaneously breathing patients; not used in 911 field settings and rarely in the patient populations we transport (ED → ICU) as most have been recently intubated and sedated.

Initial Settings	**AGE**	**RATE** per minute
FiO2=100%	Adult / Child >12 yrs	10-14
Tidal Volume (Vt)=6-8 mL/kg	Child 1-12 yrs	14-20
PEEP 5 cm H20	Infant < 1 yr	26-30
PIP Limit 30 cm H2O		

(CONTINUED)

O-TWO e700 VENTILATOR MANAGEMENT: INTUBATED PATIENT

GOALS:

- SpO2 > 95%
- EtCO2 35-45 mmHg (30-35 for head injury / sepsis)
- PIP < 30 cm H2O

Monitor SpO2 and EtCO2 closely. Adjust FiO2 and/or PEEP accordingly for hypoxia (goal of SpO2 ≥ 90%), Adjust MV (RR x TV) appropriately to address hyper/hypo-capnea.

Oxygenation: the following are the ARDSNET PEEP/FiO2 combination recommendations. The O_Two vent only has 2 settings for FiO2 .6 or 1 (60% or 100%)

Dial PEEP in incremental fashion to achieve goal.

FiO2	0.6	1.0
PEEP	10	18-24

The following are some standard initial approaches to consider for setting up your patent on the vent. Adjust as needed based on patient assessment, ventilatory compliance, and monitor/lab values:

STANDARD APPROACH	OBSTRUCTIVE	LUNG PROTECTIVE
In general, best for patients with healthy lungs that do not exhibit signs of air trapping. RR: 10 – 14 BPM TV: 8-10 cc/kg of IBW PEEP: 5 cmH2O I:E : 1:2	Best for patients that were intubated due to respiratory insufficiency/ failure that exhibit signs of air trapping. These would include patients with acute asthma, COPD, anaphylaxis, pulmonary fibrosis, etc. RR: 8-10 BPM TV: 7-8 cc/kg of IBW PEEP: 3-4 cmH2O I:E : 1:4,1:5, or 1:6 * Adjust MV (RR x Vt) appropriately to address hypercapnia. Manage I:E and Vt for patents with high Paw pressures due to poor compliance. ALS level providers may not adjust I:E settings	Typically seen in IFT setting for patients with history of ALI (burns, caustic substances to airway) or ARDS while on ventilator. RR: 18-22 BPM TV: 6-7 cc/kg of IBW PEEP: 5 cmH2O I:E : 1:2 By reducing tidal volume and increasing RR, you can prevent dangerous plateau pressures while maintaining required MV.

Monitor SpO2 and EtCO2 closely. Adjust FiO2 and/or PEEP accordingly for hypoxia (goal of SaO2 ≥ 90%), Adjust MV (RR x TV) appropriately to address hyper/hypo-capnea.

PEARLS:

The hyper-metabolic patient (sepsis, DKA, drug OD, etc.) generally requires much higher than normal MV (TV x RR). Pay attention to, and try to match close to the RR of all patients suspected of being in a hyper-metabolic state prior to induction and intubation. Tailor RR of patients intubated due to respiratory complaints to SpO2/EtCO2 values.

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Ventilator set-up, management and use in 911 and interfacility transport	--	--	--	SO*	SO

* Use of automated transport ventilators is restricted to manipulation of Tidal Volume (Vt), Respiratory Rate (RR), Fraction of inspired oxygen (FiO2) and Positive End Expiratory Pressure (PEEP)

O-TWO e700 VENTILATOR MANAGEMENT: CPAP / BiPAP

INDICATIONS:

- Congestive heart failure exacerbation including pulmonary edema
- Severe bronchospasm from reactive airway (asthma, anaphylaxis), obstructive airway disease (COPD)
- Pneumonia
- Near drowning with continued respiratory distress

PRECAUTIONS / COMPLICATIONS

- Patient must exhibit severe signs and symptoms of dyspnea and hypoxia / hypercapnia
- Patient must be awake and alert
- Patient must have ability to maintain an open airway
- Cardiogenic shock: high intrathoracic pressures my exacerbate depressed myocardial function
- Pneumothorax is no longer considered a contraindication, however, careful monitoring is indicated to avoid progressing a simple pneumothorax to a tension pneumothorax

CONTRAINDICATIONS

- Respiratory arrest
- Agonal respirations
- Children under 12 years of age
- Unconscious or obtunded/Altered
- Penetrating chest trauma
- GI Anastomosis
- Persistent nausea/vomiting
- Facial abnormalities/facial trauma
- Active upper GI bleeding or history of recent gastric surgery

O-TWO VENT

- Select appropriate presetting (adult) and change mode to CPAP
- EtCO2 and SpO2 should be closely monitored. Vent will compensate for small leaks in seal (such as from facial hair or EtCO2 cannula)

NEXT PAGE FOR APPROACH AND SET UP

(CONTINUED)

O-TWO e700 VENTILATOR MANAGEMENT: CPAP/BiPAP

CPAP	BiPAP
For use in patients exhibiting hypoxia associated with above indications. Set CPAP (PEEP); Typically, 5 – 10 cmH2O is sufficient. Do not exceed 20 cmH2O. Place mask on patient's face and hold with hand allowing patient to acclimate. Once acclimated, secure mask only tight enough to prevent seal leakage. Monitor patient closely for compliance, gastric inflation, or decreased work of breathing. Apnea of 20 seconds will trigger vent to switch to AC mode and will ventilate patient at the default settings selected (infant, child, or adult) using mask as BVM. Reposition patient to maintain open airway in this mode as you prepare to intubate. CPAP/BiPAP can trigger anxiety in many patient populations, consider anxiolytics given in low dose increments if anxiety is interfering with treatment	**For patients exhibiting both hypoxia and hypercapnia with above indications.** The O-Two e700 vent is additive in BiPAP setting meaning that CPAP (EPAP) + PSV (IPAP) = PIP Common initial setting: CPAP (EPAP) = 5 – 10 cmH2O PSV (IPAP) = 10-15 cmH2O For expected PIP range of 15 – 25cmH2O Place mask on patient's face and hold with hand allowing patient to acclimate. Once acclimated, secure mask only tight enough to prevent seal leakage. Monitor patient closely for compliance, gastric inflation, or decreased work of breathing. In general, adjust CPAP (EPAP) for hypoxia and PSV (IPAP) for hypercapnia. FiO2 should start at 60%. Titrate up to 100% if no response to increased CPAP. Apnea of 20 seconds will trigger vent to switch to AC mode and will ventilate patient at the default settings selected (infant, child, or adult) using mask as BVM. Reposition patient and place airway adjunct to maintain open airway in this mode as you prepare to intubate.

INTERFACILITY:

While most hospital vents are additive (EPAP (CPAP)+ PSV = PIP) in BiPAP mode , some may be absolute where EPAP + IPAP = PIP. If unknown, use hospital PIP as target for settings if they are working for the patient and adjust accordingly.

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Ventilator CPAP/BiPAP set-up, management and use in 911 and interfacility transport	--	--	--	**SO***	**SO**

* Use of automated transport ventilators is restricted to manipulation of Tidal Volume (Vt), Respiratory Rate (RR), Fraction of inspired oxygen (FiO2) and Positive End Expiratory Pressure (PEEP)

O-TWO e700 VENTILATOR MANAGEMENT: CPR

INDICATIONS:

- To provide ventilation in cardiac arrest with CPR in progress.

PRECAUTIONS / COMPLICATIONS:

- Monitor for gastric inflation when using as BVM. Intubate patent as soon as practicable.

O-TWO VENT:

- The e700 series vent has a CPR mode. However, it was designed for manual CPR and cannot adequately be synchronized with the Lucas Device. As such, there is a second approach to ventilation when in use with the Lucas device.

- In both cases, FiO2 should be set at 100%. Watch O2 tank usage closely.

Lucas Device	Manual CPR
Select adult setting (infant or child will be too small for Lucas use). Select AC mode and connect to patient. Initiate ventilations **Turn off Trigger** **Turn off PEEP** **Set Pressure Max alarm to 60psi**	Select appropriate setting (infant, child, or adult). Select CPR mode and select whether ventilating via BVM or ETT / Supraglottic. Initiate ventilations/compressions using vent metronome for guidance.

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Ventilator set-up, management and use during cardiac arrest	--	--	--	**SO***	**SO**

* Use of automated transport ventilators is restricted to manipulation of Tidal Volume (Vt), Respiratory Rate (RR), Fraction of inspired oxygen (FiO2) and Positive End Expiratory Pressure (PEEP)

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NON TRAUMATIC ABDOMINAL PAIN

INFORMATION NEEDED

- **Pain:**
  - Nature (cramping, sharp, dull), severity, duration, location, radiation to: back, groin, chest, shoulder.
- **Associated Symptoms:**
  - Vomiting, bilious emesis, hematemesis, coffee ground emesis, melena, known or suspected pregnancy, last menstrual period, urinary difficulties, fever, last BM, last meal.
- **Past History:**
  - Previous trauma, abnormal ingestions, medications, known diseases, surgeries, OB/GYN history (see 2240 OB complications protocol if suspected for current or recent pregnancy)

SPECIFIC OBJECTIVE FINDINGS

- **Vital signs**
- **General appearance:**
  - Restless, quiet, sweaty, pale.
- **Abdomen:**
  - Tenderness, guarding, distention, rigidity, pulsatile mass, response to movement.
- **Patient position:**
  - Keeping still or moving (writhing)
- **Input/Output:**
  - Emesis, stool, or urine; describe, amount.
- **Equality of pulses:**
  - Check for equality of pulses- especially in lower extremities
- **Fever present:**
  If history and assessment is indicative of potential sepsis , treat s/s and pain as below and follow 2260 sepsis protocol.

TREATMENT

- Position of comfort.
- NPO, including medications.
- Administer O2 for SaO2<90%, or signs or symptoms indicating increased oxygen consumption/demand.
- Establish IV accesses and draw labs.
- Signs of shock: Administer normal Saline standard volume 500cc fluid bolus; titrate to BP. Consider vasopressors if no improvement after fluid bolus (see 2270 Shock-Medical Protocol)
- Monitor vital signs during transport
- Perform 12 lead ECG on all of the following:
  - Diabetic
  - Age > 50
  - Upper abdominal pain concerning for ACS
  - Unstable vital signs in the adult patient
- Pain control- administer fentanyl per protocol if the patient is hemodynamically stable. Do not withhold pain medicine for fear of altering the exam.

(CONTINUED)

NON TRAUMATIC ABDOMINAL PAIN

SPECIAL PRECAUTIONS

- Suspect and to the extent possible rule out life threatening causes of abdominal pain:
  - Cardiac Etiology
    - MI, ischemia
  - Vascular etiology
    - AAA, Aortic dissection
  - GI Bleed
  - Gynecologic etiology
    - Ectopic pregnancy
- Other/related important diagnoses to consider are those associated with catastrophic internal bleeding: ruptured aneurysm, bleeding ulcer, ectopic pregnancy, etc. Since the bleeding is not apparent, you must think of the volume depletion and monitor patient closely to recognize shock. If a patient presents in shock (see 2270 Shock – Medical Protocol),
- Elderly patients may have significant hypovolemic shock with systolic blood pressures above 90 mmHg and absent tachycardia. With signs of hypovolemia (see 2270 Shock – Medical Protocol) contact medical control and treat with IV fluids.
- Upper abdomen and lower chest pain may reflect thoracic pathology such as myocardial infarction, etc. Massive fluid resuscitation may be contraindicated. If in doubt, consult medical control and monitor closely.

Pediatric Patients:

- Life-threatening causes vary by age
- Consider occult or non-accidental trauma
- Toxic ingestion
- Button battery ingestion
- GI bleed, peritonitis

ACUTE ADRENAL INSUFFUCUENCY (Addisonian Crisis)

OVERVIEW:

- Adrenal crisis is a life threatening exacerbation of adrenal insufficiency due to increased physiologic demand (e.g. infection) or decreased supply (e.g. discontinuation of steroid therapy) of cortisol. It usually occurs in response to a major stress, such as acute myocardial infarction, sepsis, surgery, major injury, trauma or other illness in any patient with adrenal insufficiency. **The most frequent iatrogenic cause of acute adrenal crisis is rapid withdrawal of steroids in patients with adrenal atrophy secondary to long term steroid administration.**
- In the United States the most common cause for adrenal insufficiency is infection with the HIV virus.
- **A high index of suspicion for adrenal crisis should be given in cases of unexplained hypotension, especially in patients with increased risk such as acquired immunodeficiency syndrome patients, those on prior glucocorticoid therapy or patients with known autoimmune disease.**
- Administration of steroids are life-saving and necessary for reversing shock or preventing cardiovascular collapse

Patients at risk for acute adrenal insufficiency (Addisonian crisis):

- Identified by family or medical alert bracelet
- Chronic steroid use (more than a month) with abrupt cessation
- Congenital Adrenal Hyperplasia
- Addison's disease
- AIDS patients

Signs and Symptoms of acute adrenal crisis

- Weakness, fatigue and orthostatic hypotension are early symptoms and signs
- Hypotension/Shock – often refractory to fluids or vasopressors
- Pallor, weakness, lethargy
- Abdominal pain
- Pain in the lower legs or back
- Nausea/vomiting
- Altered mental status
- Persistent hypoglycemia after treatment
- ECG changes may be present
    - Low voltage in all leads
    - Changes associated with hyperkalemia
        - Peaked T waves
        - Prolongation of the QRS interval
        - Loss of P waves in severe cases

Treatment is also appropriate if the patient has a physician's order for steroids (usually SoluCortef) but is unable to self-administer.

(CONTINUED)

ADRENAL INSUFFUCUENCY (Addisonian Crisis)

TREATMENT:

- 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
- Methylprednisolone (Solu-medrol) 125 mg IV/IO
- Monitor vital signs during transport
- Continue to monitor blood glucose for development of hypoglycemia
- Monitor 12 lead ECG for signs of hyperkalemia
- Base contact if patient is not responding to treatment

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 (SoluCortef) for adrenal crisis, for instance, if a patient or family member has this medication available on scene. Contact base for direct verbal order.

SoluCortef IV/IO/IM (ordered by the patient's personal physician)

- Adult: usual dose is 100 mg OR the specified dose prescribed by the endocrinologist
- Pediatric: specified dose prescribed by the endocrinologist

ADULT RESPIRATORY DISTRESS

INFORMATION NEEDED

- History of present illness
  - acute change or injury, slow deterioration, paroxysmal nocturnal dyspnea
- Past medical history
  - Chronic lung/heart problems or known diagnosis, medications and compliance, home oxygen, past allergic reactions, recent surgery, tobacco use
- Associated symptoms
  - Chest pain, cough – productive ?, fever, hand or mouth paresthesia
- Has the patient been intubated for this condition in the past?

SPECIFIC OBJECTIVE FINDINGS

- Vital signs – Including SpO2 and waveform capnography
- Oxygenation/ perfusion
  - EtCo2 value, level of consciousness, cyanosis
- Respiratory effort
  - Accessory muscle use, tripod position, pursed lips
- Neurologic signs
  - Slurred speech, impaired consciousness, evidence of drug/alcohol ingestion
- Signs of upper airway obstruction
  - Hoarseness, drooling, exaggerated chest wall movements, stridor
- Signs of congestive failure
  - Neck vein distention in upright position, rales, peripheral edema
- Breath sounds
  - Clear, decreased, rales, wheezing, or rhonchi
- Skin signs
  - Hives, upper airway edema
- Evidence of trauma
  - Crepitation of neck or chest, bruising, steering wheel damage, penetrating wounds

TREATMENT

- Assure and maintain patent airway - if not see 2040 Obstructed Airway Protocol
- Assist patient with ventilations if inadequate for physiologic state. See 1040 BVM ventilation Protocol
- Apply supplemental oxygen during initial assessment
- Monitor Vital Signs – including SpO2 and EtCO2 See 1050 Capnography Protocol
  - An elevated EtCO2 reading is likely indicative of a pulmonary cause of respiratory distress
  - A lowered EtCO2 reading is usually indicative of a problem with metabolism or perfusion and should be addressed if possible
- Check Breath Sounds
- 12 lead ECG See 1100 12 Lead ECG protocol
- CPAP if indicated See 1080 CPAP Protocol
- Clinical findings consistent with Anaphylaxis/Allergy – See 2060 Allergy Anaphylaxis Protocol
- Clinical Findings suggestive of Asthma or COPD exacerbation – See 2090 Asthma/COPD Protocol
- Clinical findings suggestive of CHF or Pulmonary Edema – See 2140 CHF – Pulmonary Edema Protocol

(CONTINUED)

ADULT RESPIRATORY DISTRESS

SPECIAL PRECAUTIONS

- Consider pulmonary and non-pulmonary causes of respiratory distress:
  - Pulmonary embolism
  - Pneumonia
  - Heart attack
  - Pneumothorax
  - Sepsis
  - Metabolic acidosis (e.g.: DKA)
  - Anxiety
  - Cardiac tamponade
  - Cardiac dysrhythmia
- Goal is maximization of oxygenation and ventilation in all cases
- CPAP may be particularly useful in mixed picture with hypoxia and/or hypoventilation
- Avoid albuterol in suspected pulmonary edema (Wheezing in older persons may be due to pulmonary edema ("cardiac asthma"))
- Don't over-diagnose "psychogenic" in the field. Your patient could have a pulmonary embolus or other serious problem; give him or her the benefit of the doubt. Treatment with oxygen will not harm the “hyperventilator”, and it will keep you from underestimating the problem.
- Act early and do not wait for the patient to be in full respiratory arrest to begin assisting ventilations and securing an advanced airway, especially in cases of anaphylaxis or other forms of airway edema that is progressing.

AGITATED PATIENT

It is the policy of this agency that patient care is delivered with a priority placed on safe management of the agitated patient. At all times, crew and patient safety should be considered paramount.

As such, an emphasis should be placed on chemical restraint vs physical restraint where securing the patient will be required.

Physical restraints have potential to harm the patient, delay definitive care, and place the provider in extended dangerous situations. In general, chemical restraint provides a safer alternative for both patient and provider.

The following protocol covers the management of the agitated patient. Follow appropriate treatment protocols (i.e. Altered Mental Status, Behavioral Disorders, etc.) once the patient is under control. That being said, use best medical judgment in evaluating the situation and treating the patient with safety as the first concern.

For the purposes of this protocol, the agitated patient will be divided in to three types. Keep in mind that a patient may move from one category to another at any time and be prepared to act accordingly.

AGITATED BUT COOPERATIVE

These patients are often anxious, upset, and or delusional but respond to suggestion and verbal de-escalation. Generally calm, reassuring, but firm guidance is all that is necessary, however, the patient may require sedatives to decrease anxiety.

	EMT - IV	AEMT	EMT-I/99	P	CCP
Lorazepam 1-2mg IV	--	--	VO	SO	SO

DISRUPTIVE WITHOUT DANGER

These patients are disruptive, uncooperative, and/or belligerent but not likely an imminent threat at this time. They typically will not respond to verbal de-escalation or follow simple commands.

They do however need to be evaluated and transported by ambulance which will necessitate sedation for the crew and patient's safety.

	EMT-IV	AEMT	EMT-I/99	P	CCP
Droperidol 5 mg IV/IM **Or** **Lorazapam 1-2mg IV/IM** **Or** **Midazolam 5mg IM**	--	--	VO	SO	SO

(CONTINUED)

AGITATED PATIENT

DISRUPTIVE WITH IMMEDIATE DANGER TO SELF OR OTHERS

This is the combative patient that is an imminent physical threat and will continue fighting despite overwhelming force. No amount of verbal reasoning will work.

These patients may require the use of multiple agents and/or repeat doses

	EMT-IV	AEMT	EMT-I/99	P	CCP
Droperidol 5-10 mg IM **OR** **Benadryl 50 mg IM** **Ativan 2 mg IM** **Haldol 5 mg IM** **OR**	--	--	**VO**	**SO**	**SO**
Midazolam 5mg IM may repeat with second dose of 5mg if needed **This may take a prolonged time to act be prepared for continued aggression for a duration of time.** **CONTACT MEDICAL CONTROL FOR ADDITIONAL ORDERS AS NEEDED**	--	--	**Y**	**Y**	**Y**

Special Considerations:

- DISRUPTIVE WITH IMMEDIATE DANGER TO SELF OR OTHERS IS NO LONGER ALLOWED TO BE MANAGED WITH KETAMINE
- Generally speaking if you suspect sympathomimetic ingestion Versed will be more effective than Droperidol. However, if you suspect Alcohol Ingestion, Droperidol is likely to be especially effective with fewer complications.
- Have a plan and assemble adequate force (Ideally one person for each limb and head in addition to medic administering sedative.)
- Place high flow oxygen via NRB snuggly over pt face. This controls patient's spit and supplies needed supplemental oxygen. (Consider that combativeness may be due to hypoxia)
- IM injections should be given through clothing into large muscle groups; anterior or lateral thigh, or deltoid.
- Crew safety is always of the utmost importance! If you need to leave the scene for your safety until law enforcement has the patient adequately restrained DO THAT – notify dispatch over the radio, request law enforcement officers and stage in a safe location – Be sure to document the circumstances carefully - return to the scene when law enforcement officers tell you it is safe to do so

(CONTINUED)

AGITATED PATIENT

- At all times, be prepared to monitor and manage airway. Patients having received Midazolam especially may be prone to respiratory depression. Adequate O2, Pulse oximetry, ETCO2 monitoring are required in addition to BP and cardiac monitoring once the patient is sedated.
    - The need for airway management is not considered a failure of care. We have many tools in our tool kit to manage airway up to and including CFI. Patient management under controlled conditions is a vast improvement in safety and likelihood of good patient outcome vs the alternative of physical restraint and violence.

AIRWAY OBSTRUCTION

INDICATIONS

- Complete or partial obstruction of the airway due to a foreign body
- Complete or partial obstruction due to airway swelling from anaphylaxis, croup, or epiglottitis
- Patient with unknown illness or injury who cannot be ventilated after procedures of opening the Airway.

PRECAUTIONS / COMPLICATIONS

- Patients with partial airway obstruction can be very uncomfortable and vociferous. Abdominal or chest thrusts will not be effective and may be injurious to the patient who is still ventilating. Resist the temptation to attempt relief of obstruction if it is not complete, but be ready to intervene promptly level of responsiveness changes.
- Hypoxia from airway obstruction can cause seizures. Chest or abdominal thrusts may not be effective until the patient becomes relaxed after the seizure is over.
- Hypoxic brain damage and death from unrecognized or unrelieved obstruction
- Trauma to ribs, lung, liver and spleen from chest or abdominal thrusts (particularly when forces are not evenly distributed)
- Vomiting and aspiration after relief of obstruction
- Chest compression should be performed on patients who are visibly pregnant or who are too obese to properly perform abdominal thrusts

TECHNIQUE

Complete Airway Obstruction – Adult

Responsive –

- Perform abdominal thrusts until the obstruction is relieved or the patient loses consciousness

Unresponsive -

- Open airway using head tilt-chin lift or jaw thrust.
- Attempt to ventilate using mouth-to-mask or BVM ventilations.
- If unable to ventilate, reposition airway and reattempt ventilations.
- If airway remains obstructed, visualize with laryngoscope and remove any obvious foreign body using Magill forceps.
- Reposition the airway and attempt to ventilate.
- If unable to ventilate – begin CPR
- Reposition the airway and observe for foreign body
  - If able to be seen remove using Magill forceps or suction catheter – DO NOT perform finger sweeps object removed reattempt to ventilate.
  - If unable to been seen resume chest compressions and prepare to attempt intubation
- If airway is still obstructed – attempt intubation
- If unable to intubate and unable to ventilate - surgical airway should be considered
- When obstruction relieved:
  - Keep patient on side, remove debris if it can be visualized with suction catheter or Magill forceps.
  - Apply O2, high flow; reservoir mask.
  - Assess adequacy of ventilation, and support as needed.
  - Suction aggressively.
  - Restrain if combative.

(CONTINUED)

AIRWAY OBSTRUCTION

Partial Airway Obstruction – Adult

- Have patient assume most comfortable position.
- Apply O2, high flow by non-rebreather mask.
- Attempt suctioning of upper airway.
- If patient unable to move air, confused, or otherwise deteriorating, visualize airway, remove foreign body or perform abdominal thrusts as noted above.

Complete Airway Obstruction – Infant

Responsive

- Hold infant face down on your forearm with the head slightly lower than the chest – support infants head and jaw with your hand.
- Deliver up to 5 back slaps between the shoulder blades using the heel of your hand
- After delivering back slaps if the airway remains obstructed turn infant as a unit and provide 5 quick downward chest thrusts in the middle of the chest (same location as CPR)
- Repeat the process of 5 back blows and 5 chest thrusts until the obstruction is removed or the infant becomes unresponsive
- When obstruction relieved
    - Apply suction or use Magill forceps to remove object if still in oropharynx
    - Apply O2, high flow; reservoir mask.
    - Assess adequacy of ventilation, and support as needed.
    - Suction aggressively.

Unresponsive

- Perform CPR with the extra step of checking the airway for foreign objects each time before attempting to ventilate
- If object is seen remove with Magill's or suction
- If no object is able to be seen consider intubation – surgical airway is CONTRAINDICATED in infants and children

Partial Airway Obstruction - Infant

- Parents or other caretakers will be your biggest challenge – try to calm them as best as you can
- Apply O2, high flow by non-rebreather mask.
- Attempt suctioning of upper airway.
- If patient unable to move air, confused, or otherwise deteriorating, visualize airway, remove foreign body or perform back blows/chest compressions as noted above.

ALCOHOL/DRUG INTOXICATION

INFORMATION NEEDED

- Determine LOC and assess ABCs
    - ALWAYS consider alternative diagnoses
- Obtain vital signs, including SpO2
- Consider EtCO2 and cardiac monitor as indicated
- Perform head-to-toe exam
- Determine medical history, medications
- Check BGL unless mild symptoms.
    - If considering release, must check BGL.

SPECIFIC OBJECTIVE FINDINGS

BGL < 60 mg/dL or clinical condition suggests hypoglycemia?
Does patient have signs of acute illness or injury?
Does patient have evidence of incapacitating intoxication?

If the answer to **ALL** of the above questions is **NO** these findings suggest lower level of intoxication that is low risk. These may decline treatment and/or transport and be released to law enforcement or to a sober friend or family member.

DEFINITIONS:

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

- 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
- History or signs of acute head injury
- Speech that is not understandable or abnormal aside from slight slurring
- Evidence of other substance abuse

Incapacitating Intoxication

- Semiconscious, unconscious, or somnolence, not protecting airway
- Unable to stand from seated position and walk with minimal assistance
- Disoriented
- Speech is not understandable
- At immediate risk of environmental exposure or trauma due to unsafe location

ALLERGY / ANAPHYLAXIS

An allergic reaction is defined as an exposure to a suspected allergen accompanied by symptoms from the respiratory, cardiovascular, gastrointestinal, or integumentary systems.

An anaphylactic reaction is defined by one of the following three conditions:

- Exposure to suspected allergen AND hypotension
- Exposure to suspected allergen AND symptoms from TWO or more of the below body systems:
  - Respiratory
  - Cardiovascular
  - Gastrointestinal
  - Integumentary
- Allergic reaction that has failed to respond to treatment or has worsened

INFORMATION NEEDED

- **History:**
  - Current sequence of events, exposure to allergens (bee stings, drugs, nuts, seafood most common), prior allergic reactions.
- **Current symptoms:**
  - Itching, wheezing, nausea, weakness, rash, anxiety, SOB, airway swelling or irritation.
- **Medications:**
  - Past medical history.
  - Current medications including newly prescribed, over-the-counter or alternative medications

SPECIFIC OBJECTIVE FINDINGS

- **Vital signs:**
  - Heart Rate – Tachycardia?
  - Blood Pressure – Hypotension?
  - Breath Sounds – Wheezes? Stridor? Diminished?
- **Level of consciousness.**
- **Airway:**
  - Swelling including tongue and face, stridor
- **Skin:**
  - Hives, swelling, flushing.

TREATMENT

Allergic Reactions

- Assure and maintain a patent airway
- Administer oxygen as needed.
- Remove cause of anaphylaxis- stinger or other allergen
- Establish IV, administer fluid bolus
- Monitor Cardiac Rhythm and EtCO2 (a change in values can be your first clue of progression to Anaphylaxis)
- Benadryl (see 6110 Diphenhydramine Protocol)

Anaphylactic reactions

- All of the above plus the following
- Epinephrine (see 6130 Epinephrine Protocol)
- Aggressive fluid resuscitation and vasopressor support as needed
- Epinephrine infusion IV/IO (for persistent hypotension following IM Epinephrine) (see 6130 Epinephrine Protocol)
- Methylprednisolone (Solu-Medrol) (see 6260 Methylprednisolone protocol)

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ALLERGY / ANAPHYLAXIS

SPECIAL PRECAUTIONS

- For all allergic reaction/anaphylaxis patients, continuously assess capnography, pulse oximetry, and blood pressure throughout patient care.
- The difference between a mild allergic reaction and anaphylaxis is often subtle. The symptoms may rapidly progress en route.
- Anxiety, tremor, palpitations, tachycardia, and headache may occur with administration of epinephrine. In children, epinephrine may induce vomiting.
- Epinephrine may exacerbate preexisting coronary artery disease and cause angina, MIs or arrhythmias. Judicious and careful use is advised.
- Examine the airway carefully as the edema may be localized to the mouth, tongue or uvula. If there is evidence of progressive swelling, early intubation should be considered. (see 1070 Chemically Facilitated Intubation Protocol)
- If airway swelling is due to an ACE inhibitor reaction consider early intubation and/or prompt transport to a facility with FFP. These reactions can occur with a patient on newly prescribed ACE inhibitors or one that has been on the therapy for many years.

ALTERED MENTAL STATUS

INFORMATION NEEDED

- **Present history:**
  - Time of onset of change noted by patient or caregiver, progression of present illness or symptoms; preceding symptoms such as headaches, seizures, confusion, trauma, etc. Ask about changes in speech, numbness, focal weakness, facial droop, visual changes, gait/ balance.
- **Past history:**
  - Previous medical or psychiatric problems, including diabetes, previous stroke, trauma, high blood pressure, heart disease or arrhythmias, seizure disorder, bleeding disorders.
  - Determine baseline mental status and progression of changes
- **Medications:**
  - Use, misuse, or abuse (including illicit drug use)
- **Surroundings**:
  - Check for pill bottles, syringes, etc., and bring with patient. Note odor in house.
  - Heat/Cold
- **Investigate**:
  - AEIOU TIPS (Alcohol, Acidosis, Epilepsy, infection, overdose, uremia, trauma, tumor, insulin, psychosis, stroke)

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- Level of consciousness and neurological status
- Any signs of head trauma or other trauma
- Neurological exam:
  - motor strength- weakness limited to one side
  - sensory- loss of sensation on one side
  - facial weakness- noticeable droop per your exam or per caregiver
  - gait/ balance- ambulation (with assist if patient unstable)
  - GCS
  - speech- slurring; difficulty articulating or finding words
- Needle tracks
- Medical alert tag
- **Past pertinent medical history:**
  - Stroke / CVA.
  - Cardiac history.
  - Diabetes.
  - Seizures.
  - Head injury.
  - Psychiatric or mental illness

TREATMENT

- Assure and maintain a patent airway. Suction if needed.
- Recovery position unless spinal precautions indicated.
- Oxygen sufficient to maintain SpO2 >92%
- Monitor Vital Signs - including ECG, SaO2, ETCO2, and frequent BP
- Establish IV and draw labs.
- Obtain Blood Glucose Level
- Administer Dextrose per protocol if Blood Sugar less than 60 mg / dL or with symptoms of hypoglycemia.
- Consider Narcan per protocol 1-2mg IVP, IN, or IM
- Frequently reassess airway reflexes and GCS

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ALTERED MENTAL STATUS

SPECIAL PRECAUTIONS

- Safety to rescuer: check for gases or other toxins.
- Be particularly attentive to airway. Difficulty with secretions, vomiting, and inadequate tidal volume are common.
- Hypoglycemia may present as focal neurologic deficit or coma.
- Coma in the diabetic may be due to hypoglycemia or to hyperglycemia (diabetic ketoacidosis). IV dextrose should be given to all unconscious diabetics, as well as patients with coma of unknown origin unless a blood glucose reading in the high range is obtained.
- Stroke patients may be alert but unable to respond (aphasic); therefore, communicate with the patient and explain what you are doing. Be sensitive to the patient with expressive aphasia who can understand you but cannot express words. These patients may become agitated and require sedation if verbal de-escalation fails.
- Naloxone is useful in any potential narcotic overdose, but be sure the patient is controlled before giving naloxone to a patient in whom there is a suspicion or history of narcotic dependency. The acute withdrawal precipitated in an addict may result in violent combativeness. Give slowly and incrementally to avoid adverse effects
- Use caution with administration of dextrose in a suspected hemorrhagic stroke as it is toxic outside of the vasculature and can cause destruction of brain tissue. Do not withhold dextrose if the patient is hypoglycemic.
- Medication interaction, unintentional or intentional overdose is a common cause of altered mental status, especially in the elderly. Obtaining an accurate medication list or brining the medications to the hospital is incredibly helpful.

TACHYCARDIA

For purposes of dysrhythmia treatment, "symptomatic" is defined as presence of symptoms attributable to cardiac dysrhythmia. Symptoms vary among patients, but may be described as fatigue, orthostatic changes, pain, nausea, dizziness, or unsteadiness.

"Stable" and "unstable" refer to the presumed likelihood that a rhythm will deteriorate. Characteristics of "unstable" dysrhythmias might include loss of consciousness, acuity of symptom onset, speed of symptom worsening, atypical decreased interaction or mentation, profound hypotension or hypocapnea. The goals of treatment are to reverse symptoms by normalizing heart rate and blood pressure.

Asymptomatic dysrhythmias may not require urgent intervention but should be dynamically and constantly monitored for deterioration or clinical change.

INFORMATION NEEDED

- **Present symptoms**:
  - Sudden or gradual onset, palpitations
- **Associated symptoms:**
  - Chest pain, dizziness or fainting, trouble breathing, abdominal pain, fever
- **Prior history:**
  - Arrhythmias, cardiac disease, exercise level, pacemaker
- **Current medications or ingestions:**
  - Particularly cardiac
  - Toxic substances or overdoses

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
  - Pulse rates ≤150 and regular are likely Sinus Tach in adults (children - 180 bpm, infants - 220 bpm)
    - Search for and treat underlying cause: e.g. dehydration, fever, hypoxia, hypovolemia, pain
    - Consider medical shock
- Evaluate the patient. Is the patient perfusing adequately or are there signs of inadequate perfusion?
  - **Signs of poor cardiac output:**
    - Altered level of consciousness, mental status changes
    - Appearance of shock: cool/clammy skin, pallor
    - Blood pressure < 90 systolic
    - EtCO2 reading < 35 mmHg
    - Chest pain consistent with angina
  - **Signs of cardiac failure:**
    - Neck vein distension
    - Lung congestion, rales
    - Peripheral edema
  - **Signs of hypoxia:**
    - Marked respiratory distress
    - Cyanosis

(CONTINUED)

TACHYCARDIA

TREATMENT

- ABCs - apply oxygen to achieve SpO2≥ 94% and assist ventilations as needed.
- Apply cardiac monitor and evaluate dysrhythmia.
- Establish venous or intraosseous access.
- Document the dysrhythmia by rhythm strip and 12 lead ECG

Tachycardia with pulse – Stable, symptomatic patient

- Evaluate 12 lead ECG for QRS duration and regularity of rhythm
- **Narrow QRS – Regular (stable, symptomatic, sustained heart rate ≥ 150)**
  - Vagal maneuvers
  - Fluid Bolus
  - Adenosine per protocol
  - If rhythm does not convert, continue monitoring
- **Narrow QRS – Irregular (Stable, symptomatic, sustained heart rate ≥ 120 BPM)**
  - Fluid Bolus
  - Amiodarone infusion per protocol if diltiazem contraindicated
  - If rhythm does not convert, continue monitoring
- **Wide complex – Regular (Stable, symptomatic, sustained heart rate ≥ 120 BPM)**
  - Amiodarone per protocol
  - If rhythm does not convert, continue monitoring
- **Wide complex – Irregular (Stable, symptomatic, sustained heart rate ≥ 120 BPM)**
  - Magnesium Sulfate per protocol if polymorphic (Torsades de Pointes)
  - If rhythm does not convert, continue monitoring

Unstable Tachycardia

- Synchronized cardioversion (see 1060 Cardioversion protocol) for all rhythms except Torsades de Pointes
- Defibrillation for Torsades de Pointes

SPECIAL CONSIDERATIONS

- Treat the patient, not the arrhythmia! If the patient is perfusing adequately, there is no need for emergency treatment. This is true of ALL dysrhythmias. What is normal for one person may be fatal to another.
- Multifocal Atrial Tachycardia is almost always caused by a respiratory condition such as COPD. Treatments are aimed at the underlying condition and require no specific treatments for the MAT.
- The treatment of PVCs is rarely, if ever, indicated in the prehospital setting. PVCs are most often a sign of inadequate coronary perfusion or hypoxia, thus treat the cause.
- Documentation of and recording arrhythmias is extremely important. Field treatment of an arrhythmia may be lifesaving, but long-term treatment requires knowing what the problem was.
- Correct arrhythmia diagnosis based only on monitor strip recordings is difficult and often not possible. Treatment must be based on observable parameters: rate, patient condition and distance from the hospital.

BRADYCARDIA

For purposes of dysrhythmia treatment, "symptomatic" is defined as presence of symptoms attributable to cardiac dysrhythmia. Symptoms vary among patients, but may be described as fatigue, orthostatic changes, pain, nausea, dizziness, or unsteadiness.

"Stable" and "unstable" refer to the presumed likelihood that a rhythm will deteriorate. Characteristics of "unstable" dysrhythmias might include loss of consciousness, acuity of symptom onset, speed of symptom worsening, atypical decreased interaction or mentation, profound hypotension or hypocapnea. The goals of treatment are to reverse symptoms by normalizing heart rate and blood pressure.

Asymptomatic dysrhythmias may not require urgent intervention but should be dynamically and constantly monitored for deterioration or clinical change.

INFORMATION NEEDED

- **Present symptoms**:
  - Sudden or gradual onset, palpitations
- **Associated symptoms:**
  - Chest pain, dizziness or fainting, trouble breathing, abdominal pain, fever
- **Prior history:**
  - Arrhythmias, cardiac disease, exercise level, pacemaker
- **Current medications or ingestions:**
  - Particularly cardiac
  - Toxic substances or overdoses

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- Evaluate the patient. Is the patient perfusing adequately or are there signs of inadequate perfusion?
  - **Signs of poor cardiac output:**
    - Altered level of consciousness, mental status changes
    - Appearance of shock: cool/clammy skin, pallor
    - Blood pressure < 90 systolic
    - EtCO2 reading < 35 mmHg
    - Chest pain consistent with angina
  - **Signs of cardiac failure:**
    - Neck vein distension
    - Lung congestion, rales
    - Peripheral edema
  - **Signs of hypoxia:**
    - Marked respiratory distress
    - Cyanosis

(CONTINUED)

BRADYCARDIA

TREATMENT

- ABCs - apply oxygen to achieve SpO2≥ 94% and assist ventilations as needed.
- Apply cardiac monitor and evaluate rhythm
  - Is there a pulse corresponding to monitor rhythm?
  - Are the ventricular complexes wide or narrow?
  - What is the relation between atrial activity (P waves) and ventricular activity (QRS complexes)?
  - Is the arrhythmia potentially dangerous to the patient? (see below)
- Establish venous or intraosseous access.
- Document the dysrhythmia by rhythm strip and 12 lead ECG
- Most bradycardic patients are not sufficiently symptomatic to require intervention.

Bradycardia with pulse – Stable, symptomatic patient

- Stable bradycardia may be accompanied by symptoms without hemodynamic compromise or be asymptomatic. If bradycardia is an unusual finding based on patient complaint and history, assess for underlying cause. Potential causes may include electrolyte disturbances, toxicity, MI, or increased vagal tone.
  - Observe on monitor
  - If patient is symptomatic
    - Treat with fluid bolus and position patient supine

Unstable Bradycardia

- Unstable bradycardia is defined as decreased alertness and profound hypotension.
- Symptomatic severe bradycardia is usually related to one of the following:
  - Ischemia (MI)
  - Drugs (beta blocker, Calcium channel blocker)
  - Electrolytes (hyperkalemia)
- Oxygenation for infants with HR < 100 bpm
- Ventilation for pediatrics with HR < 60 bpm
- Start CPR for infants and children with persistent HR < 60 bpm after aggressive positive pressure ventilation
- Atropine per protocol
- For 2nd degree type II and 3rd degree consider transcutaneous pacing as initial treatment
- Transcutaneous pacing if refractory to atropine
- Consider Epinephrine drip per protocol
- Consult medical control if hypotension / hypoperfusion persists

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

(CONTINUED)

BRADYARRHYTHMIA

OTHER SPECIAL CONSIDERATIONS

- Treat the patient, not the arrhythmia! If the patient is perfusing adequately, there is no need for emergency treatment. This is true of ALL dysrhythmias. What is normal for one person may be fatal to another.
- Dangerous rhythms are those which do not necessarily cause poor perfusion but are likely to deteriorate. They require recognition and treatment to prevent degeneration to mechanically significant arrhythmias. Some of these potentially dangerous rhythms include ventricular tachycardia and high degree AV block: Mobitz II 2nd degree block or 3rd degree block.
- Search for possible contributing factors: “5 Hs and 5 Ts”
- Documentation of and recording arrhythmias is extremely important. Field treatment of an arrhythmia may be lifesaving, but long-term treatment requires knowing what the problem was.
- Correct arrhythmia diagnosis based only on monitor strip recordings is difficult and often not possible. Treatment must be based on observable parameters: rate, patient condition and distance from the hospital.

OBSTRUCTIVE LUNG DISEASE

INFORMATION NEEDED

- Onset of symptoms
- Concurrent symptoms
- Usual triggers of symptoms
- Sick contacts
- Past medical history
- Treatments prior to arrival
  - Oxygen
  - Inhaler
  - Nebulizer
  - Chronic of recent steroid use
- Hospitalizations
  - Number of ED visits in past year
  - Number of admissions
  - ICU admission (ever)
  - Previously intubated for this (ever)
- Family history of Asthma

SPECIFIC OBJECTIVE FINDINGS

- Full set of vitals including SpO_2 and wave form capnography See 1050 Capnography Protocol
  - An elevated EtCO2 reading is likely indicative of a pulmonary cause of respiratory distress
  - A lowered EtCO2 reading is usually indicative of a problem with metabolism or perfusion and should be addressed if possible
- Air movement
  - Normal vs diminished, prolonged expiratory phase
- Breath sounds
  - Wheezes
  - Crackles
  - Rales
  - Rhonchi
  - Diminished
  - Clear
- Skin color
- Metal status
- Signs of distress include:
  - Apprehension, anxiety, combativeness
  - Hypoxia (< 90% oxygen saturation)
  - Accessory muscle use
  - Tripoding
  - Inability to speak full sentences
  - Cyanosis

For help in triaging asthma/COPD patients with tachypnea consider the following signs:

	$EtCO_2$	SpO_2	Tidal Volume	Lung Sounds
Mild	< 35 mmHg	>95%	Adequate	Wheezing
Moderate	35-45 mmHg	90-95%	Diminished	Wheezing
Severe	>45 mmHg	<90%	Diminished	Wheezing or diminished

(CONTINUED)

OBSTRUCTIVE LUNG DISEASE

THERAPEUTIC GOALS:

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

TREATMENT

- Assure and maintain patent airway - if not see 2040 Obstructed Airway Protocol
- Allow position of comfort
- Apply supplemental oxygen during initial assessment to a target of 94-98% saturation. Escalate from a nasal cannula as needed to reach this goal
- Assist patient with ventilations if inadequate for physiologic state.
  - BVM ventilation should be utilized in children with respiratory failure See 1040 BVM ventilation Protocol
  - Non Invasive Positive Pressure Ventilation (NIPPV) should be administered for severe respiratory distress
    - COPD exacerbations are particularly responsive to CPAP, which may help avoid the need for intubation and should be considered early in treatment plan See 1080 CPAP Protocol
- 12 lead ECG
- Clinical findings consistent with Anaphylaxis/Allergy – See 2060 Allergy Anaphylaxis Protocol
- Clinical findings suggestive of CHF or Pulmonary Edema – See 2140 CHF – Pulmonary Edema Protocol
- Nebulized Albuterol
- Nebulized Atrovent
- Establish IV access
- SoluMedrol
- Consider Epinephrine, Magnesium Sulfate
- Monitor Vital Signs – including SpO2 and EtCO2

SPECIAL PRECAUTIONS

- Invasive airways do not improve bronchospasm. The airway should be managed in the least invasive way possible. Supraglottic devices and intubation should be considered only if BVM ventilation fails. These interventions should be reserved for situations of true respiratory failure.
- Use a lower PEEP setting especially with intubation– too much positive pressure ventilation in the setting of bronchoconstriction increases the risk of air trapping which can lead to pneumothorax and cardiovascular collapse.
- Goal is maximization of oxygenation and ventilation in all cases
- CPAP may be particularly useful in mixed picture with hypoxia and/or hypoventilation
- Avoid albuterol in suspected pulmonary edema (Wheezing in older persons may be due to pulmonary edema ("cardiac asthma"))
- Act early and do not wait for the patient to be in full respiratory arrest to begin assisting ventilations.

BEHAVIORAL DISORDERS

INFORMATION NEEDED

- Obtain history of current event, inquire about recent crisis, toxic exposure, drugs, alcohol, emotional trauma, suicidal or homicidal thoughts, attempts or plans.
- Obtain past history; inquire about previous psychiatric and medical problems, medications.

SPECIFIC OBJECTIVE FINDINGS

- Evaluate vital signs.
- Thoughts of suicide - bizarre or abrupt behavior changes.
- Significant past medical history.
- Determine ability to relate to reality.
- Is the patient a threat to self or others?
- Hallucinations / Delusions.
- Is there a medical problem - Medic Alert Tag?
- Drug or Alcohol abuse.
- Signs of trauma.

TREATMENT

- Assure and maintain a patent airway
- Administer Oxygen as needed
- Monitor Vital Signs
- Obtain Blood Glucose Level if altered
  - **Treat specific medical findings per appropriate protocols (e.g. low blood sugar, OD, etc.)**
  - **Chemical restraint is preferred over physical in cases where patient, crew, or bystander safety is a concern. See Agitated Patient Protocol.**

SPECIAL PRECAUTIONS

- Psychiatric patients often have an organic basis for mental disturbances. Beware of hypoglycemia, hypoxia, head injury, intoxication, or toxic ingestion.
- If the patient does not require immediate treatment, take the time to attempt to develop a rapport with the patient. Other measures may be avoided if this can be accomplished
- If emergency treatment is necessary, do as little as possible to adequately treat the patient's physical condition while being especially respectful of their personal space.
- If the situation appears threatening, involve police before attempting to restrain. DO NOT put yourself at risk. Remember, a violent or threatening patient means the scene is unsafe and needs to be secured prior to establishing patient contact or care.
- Beware of weapons. These patients can become very violent.
- All levels of EMS provider may request an M-0.5 an involuntary transportation hold be placed on patients that they deem to be an immediate threat to themselves or others by contacting medical control and presenting their findings. On approval of Medical Control, work with law enforcement to gain compliance and determine best means of transport to hospital. See 0600 Mental Health Hold Protocol

CARDIAC ARREST: MEDICAL

Survival from out-of-hospital cardiac arrests is highly dependent on achieving the following goals:

1. Rapid response
2. Early high quality, minimally interrupted chest compressions
    a. No single pause in compressions should last more than 7 seconds.
    b. Compressions must not be interrupted for intubation for any reason. The compressions are more important than intubation.
    c. Pre-charge the monitor at least 15 seconds prior to the next scheduled rhythm analysis.
3. Early defibrillation
4. Early initial epinephrine dose

These goals can only be consistently met with a systematic, choreographed approach to cardiac resuscitation which minimizes variation.

This protocol applies for ALL medical cardiac arrests EXCEPT for resuscitation of the neonate
See 2230 Neonatal Resuscitation protocol for special neonatal details

INFORMATION NEEDED

- History of arrest:
    - Onset, preceding symptoms, bystander CPR, other treatment, duration of arrest
- Past history:
    - Diseases, medications
- Surroundings:
    - Evidence of drug ingestion, toxic exposures, trauma, other unusual presentations

SPECIFIC OBJECTIVE FINDINGS

- Level of Consciousness
- Pulseless
- Apneic.
- Air Temperature; Skin Temperature
- Signs of Trauma, blood loss
- Patient History and Medications.
- ADDITIONAL PEDIATRIC INDICATIONS:
    - Persistent bradycardia after ventilation/oxygenation, HR < 60, with poor perfusion

TREATMENT

- Initiate CPR for min of 2 min (unless patient fits criteria for field pronouncement in *0080 Field Pronouncement Protocol*)
- Access and maintain a patent airway – insert OPA, NPA or i-gel for initial airway management
- Ventilate with BVM using timing light (use two thumbs down technique if i-gel not inserted) with 100% Oxygen and EtCO2 in place
- ECG monitor; quik-combo pads
- Defibrillate if indicated
- Establish IV or IO access (IV preferred)
- *Epinephrine* (1:10000) as soon as possible
    - **Adult dose: 1000 mcg IV/IO** **Pediatric dose: 10 mcg/kg IV/IO**
- Establish second access route when practical, IV preferred if not already established
- Follow specific arrhythmia protocols for drug administration
- Change providers performing CPR every 2 minutes
- Repeat epinephrine dosing every 3-5 minutes
- Assess ETCO2 frequently to ensure adequate compressions and to see if ROSC has occurred

(CONTINUED)

- Endotracheal tube placement
  - Adult:
    - Maximum of 2 attempts after which an SGA should be inserted
    - Do not interrupt compressions to intubate
    - Verbalize airway management plan
    - Identify and palpate landmarks for possible surgical airway
    - Mandatory effective suctioning
    - Use apneic oxygenation via NC at 15-25 LPM
  - Pedi: SGA placement only
    - Intubation is only acceptable for suctioning resistant meconium aspiration, i.e., newborns with meconium staining who do not respond to vigorous stimulations, drying, and oral suctioning
- Consider H's and T's early and treat aggressively if indicated (see below)
- Monitor non-trauma ROSC for 5 minutes prior to moving to ambulance
  - 12-lead ECG
  - Maintain SpO2 between 95%-98%
  - Epinephrine infusion IV/IO
    - Adult: Continue/start epinephrine infusion (2-10 mcg/min) titrated to a SBP > 90 mmHg
    - Pedi: Not routinely indicated

TRANSPORT DESTINATION

- When the decision is made to transport to the hospital, destination should be determined:
  - All responses west of the Piedra River on Hwy 160 should be transported directly to Mercy Hospital ED, with a call to PSMC medical control.
  - Responses east of the Piedra River on Hwy 160 should come to PSMC.

UNDERLYING CAUSES OF CARDIAC ARREST

Hypothermia

- Dry and warm patient but otherwise treat as per *3070 Hypothermia protocol*

Hypovolemia

- Normal saline infusion IV/IO
  - Adult: 20 mL/kg, repeat PRN until ROSC or TOR
  - Pedi (> 5 years old): Same as adult
  - Pedi (1 month - 5 years old): 100 mL bolus, reassess, repeat PRN

Hypoglycemia

- *D10* infusion IV/IO for BGL < 60 mg/dL
  - 2.5 mL/kg – all ages

Traumatic Arrest with Thoracic Trauma (Suspected Tension Pneumothorax)

- Bilateral *Needle Thoracostomy*, repeat PRN

Beta Blocker Overdose

- Follow rhythm specific protocol, e.g., asystole, PEA, VF/PVT

(CONTINUED)

CARDIAC ARREST: MEDICAL

Calcium Channel Blocker Toxicity

- *Calcium Gluconate* IV/IO
  - Adult: 3 gm slow push
  - Pedi: 60 mg/kg slow push

Hyperkalemia with Acidosis

- *Calcium Gluconate* IV/IO
  - Adult: 3 gm slow push
  - Pedi: 60 mg/kg slow push
  - FLUSH BEFORE ADMINISTRATION OF SODIUM BICARBONATE
- *Sodium Bicarbonate* IV/IO
  - Adult: 1 mEq/kg slow push
  - Pedi (> 2): 1 mEq/kg slow push
  - Pedi (< 2): 1 mEq/kg of 4.2% slow push
- *Albuterol*, nebulized
  - Adult: 10 mg
  - Pedi: Same as adult

Tricyclic Antidepressant Toxicity

- *Sodium Bicarbonate* IV/IO
  - Adult: 1 mEq/kg slow push
  - Pedi (> 2): 1 mEq/kg slow push
  - Pedi (< 2): 1 mEq/kg of 4.2% slow push

SPECIAL PRECAUTIONS

- The only difference between ACLS and PALS is the rate of compressions (30:2 ACLS, 15:2 PALS) and PALS is more focused on oxygenation – otherwise the algorithms are EXACTLY the same
- Cardiac arrest in a trauma situation is not treated according to this protocol (*see 4110 Traumatic Arrest protocol*).
- Survival from cardiac arrest is related to the time to BOTH BLS and ALS treatment. Don't forget CPR and make sure it is constant with minimal interruptions while you prepare the advanced equipment. If needed, a call for back-up should be initiated promptly
- *See 2230 Neonatal Resuscitation protocol* for special neonatal details.
- Be sure to recheck for pulselessness and unresponsiveness upon arrival, even if CPR is in progress. This will avoid needless treatment of "collapsed" patients who are inaccurately diagnosed initially, or who have spontaneous return of cardiac function after an arrhythmia or syncopal episode.

Childbirth

OVERVIEW

- When called to a possible prehospital childbirth determine if there is enough time to transport the expectant mother to the hospital or if delivery is imminent.
- If delivery is truly imminent – **STAY ON SCENE** and immediately prepare to assist with the delivery.

SPECIFIC INFORMATION NEEDED

- Obstetric history
  - Number of previous pregnancies (gravida)
  - Number of live births (PARA)
  - Expected delivery date
  - Length of previous labors
  - Previous C-section
  - Any complications with this or any previous pregnancy
  - Prenatal care and who provider is
- Urge to push, contractions (regularity and timing), ruptured membranes
- Presence and amount of any bleeding

OBJECTIVE FINDINGS

- Crowning or bulging of perineum during contraction (visual exam) = **IMMINENT DELIVERY**
- Vaginal bleeding or fluid (note color).
- Abnormal presentation (i.e. foot, arm, cord)
- Paramedics only—Consider digital vaginal exam to determine progress of labor. Using a sterile glove, insert index and middle fingers into vagina. If the fetal head is palpable but less than a full finger length from the vaginal opening (introitus), delivery may occur in the next hour. Consider consulting medical control regarding destination.

TREATMENT

- Assure and maintain a patent airway
- Administer Oxygen (15 LPM via NRB)
- IV access

Delivery is Not Imminent

- Transport in position of comfort (preferably on the left side)
- Monitor for progression to imminent delivery
- Monitor Vital Signs
- Pain management per protocol

(CONTINUED)

Childbirth

Delivery Imminent

- If prolapsed cord or breech presentation – switch to OB/GYN complications protocol and initiate immediate transport
- Position mother supine on flat surface if possible
- Do not attempt to delay or impair delivery
- Protect perineum with gentle hand pressure
- Support and control delivery of head as it emerges
- Check for cord around neck – gently remove from around neck if present. If wrapped too tightly, clamp in two places, cut and unwrap.
- Current evidence recommends against suctioning the nose or mouth due to vagal response; only suction if there is excessive fluid or meconium in the mouth, and in that case, suction from inside the cheek and not the posterior oropharynx.
- If delivery stops progressing – baby is "stuck" – switch to OB/GYN 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

Postpartum Care infant

- Vigorous: Delayed cord clamping at 30-60 seconds post-delivery
  - Clamp cord with two clamps approximately 8 inches from infants abdominal wall and cut between the clamps with a sterile instrument
- Not vigorous (or if anything not right) clamp cord immediately
- Access:
  - Term?
  - Tone?
  - Breathing or crying?
- Given term, good tone, breathing well, baby placed with mother for skin-skin warming.
- If secretions or meconium, provide suction (mouth before nose ("M" before "N")
- Dry infant
  - <32 weeks cover in polyethylene plastic (don't dry).
- Stimulate
- Respirations should begin within 15 seconds after stimulating if not - **switch to neonatal resuscitation protocol**
- Place pulse ox (pre-ductal on R UE, wrist or hand). Preductal O2 target @ 1 min 60% & should go up by 5% every min until 5 min if not **– switch to neonatal resuscitation protocol**. Keep in mind, pulse ox is often not reliable in the immediate newborn period and should be secondary to monitoring HR.
- HR – determine by auscultation (6 sec *10, tap it out). If can't determine, use ECG monitor leads
- If HR not >100 @ 1 min, start PPV **– switch to neonatal resuscitation protocol**
- Document 1 and 5 minute APGAR scores
- Keep baby warm and covered including cap over the head

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Childbirth

APGAR Scale:

	0 Points	1 Point	2 Points
Appearance (Color)	*Blue, pale*	*Body pink, Extremities blue*	*Fully Pink*
Pulse (Heart Rate)	*Absent*	*<100*	*>100*
Grimace (Irritability)	*No response*	*Some*	*Vigorous*
Activity (Muscle Tone)	*Flaccid*	*Some flexion*	*Active motion*
Respiratory Effort	*Absent*	*Slow, irregular*	*Strong cry*

Postpartum Care Mother

- Placenta should deliver in 20-30 minutes. If delivered collect in plastic bag and take to hospital. Do not pull cord to facilitate delivery and do not delay transport waiting for placenta to deliver
- Perform fundal massage every 2-5 minutes for at least 30 minutes after the placenta delivers. This is performed at the level of the umbilicus; direct pressure on the uterine fundus can invert the uterus. The uterus should contract and feel like a softball; this will be very uncomfortable for the patient, but it is extremely important to limit hemorrhage.
- If perineum is torn and bleeding apply direct pressure with sanitary pads
- Postpartum hemorrhage – switch to OB/GYN complications protocol
- Initiate transport once delivery of child is complete and mother can tolerate movement

SPECIAL CONSIDERATIONS

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

CHEST PAIN: MEDICAL

INFORMATION NEEDED

- Pain: character, onset, duration, location, radiation, aggravation, alleviation, relationship to exertion and respirations. Similarity to previous episodes - especially prior to previous MI
- Associated symptoms: Nausea, vomiting, diaphoresis, respiratory difficulty, lightheadedness, cough, fever
- Past history**:** Previous cardiac or pulmonary problems, medications (including those for erectile dysfunction), drug allergies, past or current drug use (amphetamine, cocaine, ephedra)

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- General appearance: Color, apprehension, sweating
- Signs of heart failure: Neck vein distention, peripheral edema, respiratory distress
- Breath Sounds: Rales, wheezes or decreased sounds
- Chest wall tenderness
- Abdominal tenderness
- Peripheral pulses

TREATMENT

- Assure and maintain a patent airway. Reassure patient. Place in position of comfort
- Cardiac Monitor, 12 lead ECG (to be completed within 5 minutes of patient contact)
  - Immediately treat life threatening dysrhythmias
  - Apply defibrillation pads to ALL STEMI patients
  - Repeat 12 lead after treatment to record any
- Administer Oxygen; titrate to 94% (higher O2 saturations may lead to further tissue damage). Check breath sounds regularly
- Monitor Vital Signs
- Establish I.V.
  - If STEMI is suspected, establish a 2nd I.V (i.e. Saline Lock)
  - 18G IV to Left (or bilateral) Antecubital is the preferred site for the cardiac catheter lab.
- Fluid challenge if hypotensive

NOTES

- Findings which are more consistent with a acute coronary syndrome:
  - Discomfort or pressure over the chest which, if intermittent, lasts minutes, not seconds.
  - Worse with exertion.
  - The patient has a history of coronary artery disease, including a history of coronary stents / or bypass grafting
  - Associated symptoms include shortness of breath, nausea, lightheadedness, numbness or tingling in upper extremities, sweating, or even a recent history of increased fatigue.
  - A history of diabetes, hypertension, stimulant abuse, hypercholesterolemia, or obesity all increase the risk of coronary artery disease.
  - S-T depression, T wave inversions, new bundle branch blocks on 12-lead EKG

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CHEST PAIN: MEDICAL

PROCEDURE	EMT IV	AEMT	EMT I-99	EMT P	CCP
12 Lead EKG, repeat as needed	SO	SO	SO	SO	SO
Administer Aspirin - 324 mg PO	SO	SO	SO	SO	SO
If acute MI suspected: notify medical control immediately and send copy of EKG if possible. Confirm appropriate destination.					
Nitroglycerin Tablet (SL) – NTG infusion should be administered in lieu of multiple doses of tablet NTG	VO/P	SO	SO	SO	SO
Nitro Infusion per protocol - in patients requiring additional doses of nitro with transport time >15 min.	--	--	--	SO	SO
Fentanyl 1-2 mcg/kg IV for persistent pain; repeat as needed per protocol	--	VO	SO	SO	SO
Versed 2.5 mg increments or Ativan 1-2 mg for anxiety associated with AMI if needed	--	--	SO	SO	SO

TRANSPORT DECISIONS

- All STEMI patients west of the Piedra River on Hwy 160 should be transported directly to the Mercy Hospital ED, with a call to PSMC medical control
- All STEMI patients east of the Piedra River on Hwy 160 should be transported to PSMC.

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CHEST PAIN: MEDICAL

SPECIAL CONSIDERATIONS

- Suspicion of an acute MI is based on history. Do not be reassured by a "normal" EKG or monitor reading. Conversely, "abnormal" strips (particularly ST and T changes) can be due to technical factors or non acute cardiac diseases. ST elevation that changes after nitroglycerin administration can be significant and should be documented.
- Administer nitroglycerin if BP > 90 systolic and patient not taking erectile dysfunction medications. Repeat until pain relieved: every 5 min, or systolic BP < 90 (includes patient administered nitroglycerin within last 15 minutes).
- In patients with adequate systolic BP, consider Fentanyl 1-2mcg/kg IV for additional pain relief if needed, also consider Versed in 2.5mg increments per protocol for relief of anxiety associated with ACS if needed.
- Constant monitoring is essential. As many as 50% of patients with acute MI who develop ventricular fibrillation may have no warning arrhythmias.
- Initial dose of NTG may be administered prior to establishing IV if systolic BP is greater than 120, however, IV/IO should be established prior to subsequent doses of NTG.
- Remember there are many causes for chest pain. Consider pulmonary embolus, pneumonia, aneurysm, pneumothorax, and pericarditis. Withhold further NTG if initial doses are ineffective.
- Beware of IV fluid overload in the potential cardiac patient. If SBP >100, a minimal rate of fluid is all that is needed. If pressures drop below this after NTG, give small bolus of fluid.

CHF Exacerbation – Pulmonary Edema

INFORMATION NEEDED

- Onset
- Associated symptoms: Nausea, vomiting, diaphoresis, lightheadedness, cough, fever
- Past history**:** Previous cardiac or pulmonary problems, medications (including those for erectile dysfunction), drug allergies
- Similarity to previous episodes
- Presence of paroxysmal nocturnal dyspnea
- Previous intubations for similar episodes
- Pre-arrival treatments

SPECIFIC OBJECTIVE FINDINGS

- Vital signs – including SpO2 and EtCO2
- Abnormal respiratory pattern
- Accessory muscle use
- Ability to speak words/sentences
- Quality of air exchange - including depth of respirations and quality of breath sounds
- Skin color – presence of diaphoresis
- Mental status including anxiety
- Signs of a difficult airway
- Signs of fluid overload (ascites, JVD, peripheral edema, pulmonary edema)

TREATMENT

- Assure and maintain a patent airway. Reassure patient. Place in position of comfort
- Administer oxygen as needed for dyspnea or respiratory distress and titrate to target SpO2 of 94-98%
- Suction as necessary
- Obtain EtCO2 reading and waveform – a normal shaped waveform is indicative of a non bronchospastic cause of dyspnea – CHF Exacerbation is usually associated with a normal waveform and a low EtCO2
- 12 lead ECG
- CPAP or BVM with PEEP as needed – (consider CFI if PPV needs to be used)
  - Restoration of adequate oxygenation and ventilation should precede or be accomplished with other therapies
- 0.4 mg nitroglycerin SL (if SBP >100) and capnography cannula in place PRIOR to application of CPAP
  - Breaking the seal on the CPAP mask after application allows the escape of PEEP resulting in loss of alveolar recruitment and should be avoided as much as possible
- Nitroglycerin infusion if systolic pressure allows
- Hypotension should be treated with pressors as opposed to fluids in suspected fluid overload patients (patients with acute heart failure and hypotension have a very high mortality rate)
- Non-cardiogenic pulmonary edema (irritant inhalation, abrupt opioid withdrawal, HAPE) may benefit from albuterol/ipratropium nebulizer treatments

SPECIAL PRECAUTIONS:

- Normal EtCO2 values with tachypnea and respiratory distress is an indicator of impending respiratory failure – plan accordingly
- The use of nitroglycerin should be avoided in any patient who has taken an erectile dysfunction medication in the last 48 hours – consider base contact for consult if this applies
- EtCO2 values that are extremely high or extremely low are markers of poor outcomes and possible need for intubation

COVID RESPONSE

Recommended Personal Protective Equipment (PPE) for use with the COVID patient

Providers who will directly care for a patient with possible or known COVID, or who will be in the patient care compartment with the patient should follow standard precautions and use the recommended PPE below:

- **All Patients**
  - Mask (surgical or N95), gloves, eye protection
- **SUSPECTED COVID PATIENTS**
  - N95 respirator or face mask
  - Eye protection (i.e. goggles or face shield that fully covers the front and sides of the face)
    - Personal eyeglasses, sunglasses or contacts ARE NOT considered adequate eye protection
  - Gloves
  - Gown

Drivers

- After completing patient care and before entering driver's compartment, the driver should remove and dispose of PPE to avoid soiling the compartment
- The vehicle operator should wear am N95 mask or respirator if the patient compartment and the cab cannot be isolated

RESPONSE

- Limit number of responders entering premises: A single paramedic in full PPE should make initial contact and assessment, unless aid is required in rendering medical care. Initial assessment/questioning should be performed from 6 feet away or greater if possible.
- Don proper PPE prior to entry
- Patient should be given a surgical mask and instructed to put it on
- Treat medical conditions and co-morbidities per usual with an eye to limiting droplet exposure
- Obtain temperature and room air SpO2 on all patient in addition to standard assessment
- Transport patients with decreased SpO2, respiratory difficulties, or other symptoms requiring treatment
- Screen and treat for sepsis as indicated

TRANSPORT

- Limit the number of responders caring for the patient and/or entering the patient compartment, use proper PPE
- Turn on the patient compartment exhaust vent
- Advise receiving facility patient may need isolation precautions
- Do not remove PPE until the ambulance has been decontaminated
- Remove PPE per standard guidelines

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COVID RESPONSE

RESPIRATORY CARE FOR THE COVID 19 PATIENT

The emergence and severity of the COVID-19 disease has and will continue to necessitate alterations in our approach to respiratory care in the suspected COVID-19 patient.

The overall approach is to treat the patient while minimizing procedures that have potential to aerosolize secretions.

These include:

- High flow O2 via NRB or BVM
- Nebulized medications
- Suctioning
- CPAP/BiPAP
- Intubation

With this in mind, consider your interventions with deliberation and care.

Patients experiencing mild to moderate shortness of breath:

Nasal cannula up to 6 LPM is preferable (place surgical mask over patient's nose and mouth after placement of NC) High flow O2 increases the potential for aerosolizing secretions, therefore NRB's should be avoided if the patient can be treated by other means.

A distinctive feature of the COVID 19 disease is the potential presence of silent hypoxia. This can be seen in patients that may have SpO2 readings as low as 84% on 4 LPM NC who are in minimal to no apparent distress. In cases such as these, interventions should be kept to a minimum, perhaps increasing O2 to 6 LPM, and transport patient for further evaluation by ED physician. Treat the patient not the machine.

Should the patient require a NRB, place surgical mask over NRB mask in order to minimize exposure to aerosolized particles.

Patients exhibiting asthma exacerbation should be treated with MDI albuterol with spacer initially. If nebulized treatment is necessary, use of the safety nebulizer mask is required. Consider IM/IV epinephrine and Magnesium sulfate as alternatives to nebulized medications.

VENTOLIN (Albuterol Sulfate) MDI instructions:

- Make sure medication canister is firmly seated in actuator and shake well
- Attach actuator to spacer and have patient seal lips over spacer end
- Spray medication into spacer and have patient take a deep breath in
- May be repeated every 2-4 minutes as necessary

PROCEDURE	EMT - IV	AEMT	EMT I/99	EMTP	CCP
Albuterol MDI with Spacer • 90 mcg Inhalation	**SO**	**SO**	**SO**	**SO**	**SO**

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COVID RESPONSE

Patients in imminent respiratory failure:

Patients exhibiting altered mentation, tiring or increased work of breathing will need aggressive airway management.

The following procedures should only be done after careful consideration regarding risk vs benefit:

USE A HEPA FILTER WITH *ALL* OF THE FOLLOWING PROCEDURES

- **BVM**
  - BVM is recognized as having a high potential for generating aerosolized particles and should be attempted with two providers if at all possible. One should use the two thumbs down mask seal while the other administers breaths.

- **CPAP/BiPAP**
  - While COVID patients frequently benefit from CPAP (generally found to be more beneficial than BiPAP in maintaining airway pressures) this procedure should only be done in the field setting if there is high certainty of a good mask seal on first attempt

- **Chemically Facilitated Intubation**
  - In most cases, chemically facilitated intubation (CFI) is the preferred method of securing the airway and protecting caregivers by providing filtration of exhaled particulates.
  - Ambulance should be well ventilated during procedure
  - Minimize number of care givers to those absolutely necessary (Must be in full PPE)
  - Pull ambulance to discrete area off the road and open doors to provide additional ventilation if possible
  - Video laryngoscopy is preferred over direct laryngoscopy as it allows the caregiver to be further away from the patient's face
  - Allow adequate time for sedation and paralytics to work in order to avoid coughing or gagging by the patient
  - Intubation preferred over iGel – iGel preferred over multiple attempts at intubation
  - Use HEPA filter regardless of airway type placed

CEREBROVASCULAR ACCIDENT: CVA / STROKE

INFORMATION NEEDED

- Seizure activity- recent or past history
- Baseline mental and motor function of patient.
  - Use a bystander that can attest to the baseline status of the patient and whether your findings are an acute change
- Establish onset of symptoms as precisely as possible – i.e. 1415 not one hour ago
  - If symptoms are present on waking, they are assumed to have begun prior to onset of sleep

SPECIFIC OBJECTIVE FINDINGS

- Assess the patient:
  - Use Cincinnati Prehospital Stroke Screen (CPHSS) for all suspected stroke patients.
    - The CPHSS is positive if any of the following are abnormal:
      - Facial Droop (have patient smile and show their teeth)
        - Normal: Both sides of face move equally
        - Abnormal: One side of face does not move at all
      - Arm Drift (have patient hold both arms out with locked elbows, palms up and not touching. Maintain this for 10 seconds with eyes closed)
        - Normal: Both arms move equally or not at all
        - Abnormal: One arm drifts compared to the other
          - Any patient with positive arm drift should have a VAN assessment performed to evaluate for Large Vessel Occlusion (LVO) (See below)
      - Speech (have the patient say "you can't teach an old dog new tricks")
        - Normal: Patient uses correct words with no slurring
        - Abnormal: Slurred, inappropriate, or absent words
  - Use VAN screen for **any patient with positive arm drift**
    - Vision
      - + = gaze deviation
        - It is important to access for all directions of tracking as eye deviation may be noticeable in one direction only
      - OR
      - + = patient reports double vision, field cut or loss of vision or is unable to see your fingers in any visual quadrant
    - Aphasia
      - Any difficulty forming words?
        - Do not count slurred speech or baseline aphasia as a positive
      - Can they repeat a short sentence
      - Can they name two simple objects (pen, watch)
      - Can they follow simple commands (make a fist)
    - Neglect
      - Close eyes – touch right, then left, then both simultaneously
        - If unable to feel one side during any of the three VAN is considered positive
  - Alteration in mental status from baseline
  - History of, or signs of trauma to head or neck
  - Pupil size and bilateral reactivity.
  - GCS

(CONTINUED)

CEREBROVASCULAR ACCIDENT: CVA / STROKE

- Blood glucose- treat if hypoglycemic
- EKG(12 lead)- evaluate for arrhythmia or STEMI
- Be aware of Stroke mimics
  - Hypoglycemia
  - Post-ictal paralysis
  - Complex migraine
  - Overdose
  - Trauma
  - Bell's palsy

TREATMENT

- Assure and maintain a patent airway.
  - Consider Intubation if airway reflexes are compromised.
  - Assist ventilations with BVM if needed.
- Elevate head 30° if possible
- Establish 2 large bore IVs above wrist
- Dextrose IVP if blood sugar is less than 60 mg/dL or symptoms consistent with hypoglycemia.
- Monitor Cardiac Rhythm
- CVA Patients should be transported to PSMC for neurological tele-medicine evaluation. Notify ER of "Stroke Alert" if criteria met (see below)

SPECIAL PRECAUTIONS

- Dextrose (D10) indicated only in patients with a documented blood sugar < than 60 mg / dL.
- In patients with suspected head injury, refer to 4060 Head Injury protocol.
- Use caution with any agent that lowers blood pressure. Marked decreases in blood pressure, even if patient is still hypertensive, will worsen the ischemic effects.
- The Cincinnati Prehospital Stroke (CPSS) is designed to be very reproducible and identify those strokes most likely to benefit from reperfusion therapy, but does not identify all strokes.
- The CPSS is highly specific for stroke, but is not extremely sensitive, meaning if you have a positive CPSS, you are almost certainly having a stroke, but if you do not have a positive CPSS, you still may be having a stroke

- Stroke signs may be very subtle, therefore it is important to know other signs of stroke, which include:
  - Impaired balance or coordination
  - Vision loss
  - Headache
  - Confusion
  - Altered mental status
  - Seizure

(CONTINUED)

CEREBROVASCULAR ACCIDENT: CVA / STROKE

Initiate a Stroke Alert for patient's meeting the following criteria:

6. Age > 18 years old
7. Patient suspected of acute stroke
    a. Sudden numbness, weakness, or paralysis of face, arm or leg especially unilaterally
    b. Positive Cincinnati Stroke Scale (one positive finding is all that is required for a positive Cincinnati Stroke Scale)
    c. Sudden confusion, difficulty speaking or understanding speech
    d. Sudden trouble seeing in one or both eyes
    e. Sudden trouble walking, dizziness, or loss of balance or coordination
    f. Sudden severe headache with no known cause
8. Symptom onset is < 7 hours
9. BGL is above 60 mg/dL or not available
10. No severe trauma or witnessed seizure at onset

CEREBROVASCULAR ACCIDENT: CVA / STROKE

EMS STROKE SCREEN FORM

Patient Information:
Name:
Age: M / F
DOB: DD/MM/YY

Time Last Seen Normal (LSN) _____

Last Seen by: Name _____
Phone: _____
Relation to Patient: _____

Stroke Screen Time: _____

History Provided by: Name _____
Phone: _____
Relation to Patient: _____

Glucose > 60 mg/dL

Yes

Treat per *2170 Hypoglycemia protocol* and reassess

CPHSS Screen

- Face → ☐ Right Droop ☐ Left Droop ☐ Normal
- Arms → ☐ Right weak ☐ Left weak ☐ Normal
- Speech → ☐ Slurred ☐ Normal

☐ CPHSS Negative — Transport with NO stroke alert called

☐ LSN time < 7

☐ CPHSS POSITIVE & NO Arm drift — Meets stroke Alert Criteria – Call "stroke alert" ASAP

CPHSS Positive & YES arm weakness

VAN Screen

- Vision → ☐ Right gaze ☐ Left gaze ☐ Normal
- Aphasia → ☐ Naming difficulties ☐ Normal
- Neglect → ☐ Ignoring left body ☐ Normal

☐ One or more VAN

- NO — Meets stroke Alert Criteria – Call "stroke alert" ASAP
- YES — Meets stroke alert Criteria – Call "stroke alert with possible LARGE VESSEL OCCLUSION"

** Brainstem stroke should be considered with decreased LOC and impaired eye movements/diplopia**

EPISTAXIS

INFORMATION NEEDED

- History of Event
  - Onset
  - Trauma
  - Oxygen use
- History of previous episodes requiring hospital treatment
- Use of blood thinning medications

SPECIFIC OBJECTIVE FINDINGS

- Vital signs

TREATMENT

ADULT

- Tilt head forward and have patient blow nose to expel clots
- Spray both naris with 1-2 activations/naris phenylephrine (neosynephrine) (see 6350 phenylephrine protocol)
- Control bleeding with uninterrupted direct pressure to the fleshy areas of the nose for at least 15 minutes with rhino clamp or fingers.
- IV access and fluid bolus if signs of shock
- Dissuade patient from swallowing blood.
- If bleeding has not been controlled after 15 minutes – insert TXA saturated gauze into affected naris, replace rhino clamp or direct pressure and transport to the ED (see 6430 TXA protocol) in position of comfort (usually sitting upright)

PEDIATRIC

- Tilt head forward and have patient blow nose to expel clots
- Control bleeding with uninterrupted direct pressure to the fleshy areas of the nose for at least 15 minutes with rhino clamp or fingers.
- Dissuade patient from swallowing blood
- If bleeding has not stopped after 15 minutes patient should be transported to the ED in position of comfort (usually sitting upright)
- **NEITHER** phenylephrine or TXA are indicated in pediatric epistaxis

SPECIAL PRECAUTIONS

- Most nose bleeding is from an anterior source and may be easily controlled
- 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.

HYPERGLYCEMIA

Consider causes for hyperglycemia by thinking about the 3 "I's"

- Insulin: Any medication changes for oral medications or insulin dose – including poor compliance or malfunctioning insulin pump
- Ischemia: hyperglycemia is sometimes an indication of physiologic stress in a patient and can be a clue to myocardial infarction in particular
- Infection: Underlying infection can cause derangements in glucose control

INFORMATION NEEDED

- History of event:
  - Onset
  - Fever
  - Recent physical or emotional stress
  - Illness, Headache, Inability to concentrate
  - Confusion
  - Trembling
  - Seizures
- Last oral intake
- Recent history of polydipsia or polyuria
- Medications (Insulin and other diabetic medications)
- Past medical history

SPECIFIC OBJECTIVE FINDINGS

- New onset hyperglycemia in pediatric patients commonly presents with nausea, vomiting, abdominal pain and or increased urinary frequency

  - Mental status, level of consciousness
  - Vital signs – assess for tachycardia, tachypnea (Kussmaul's respirations)
  - BGL reading
  - EtCO2
  - Abdominal pain with nausea/vomiting – (especially in children)
  - Assess eyes for sunken appearance secondary to dehydration
  - Assess for concomitant sepsis and septic shock
  - 12 lead ECG to assess for findings of hyperkalemia or ACS

TREATMENT

If BGL is >250 mg/dL with symptoms of dehydration, vomiting, abdominal pain or altered mentation:

- Volume expansion with normal saline bolus
  - Adult – 20 mL/kg (regardless of initial blood pressure) at rate of about 1000 mL/hr – if symptoms of shock refer to shock protocol
  - Pediatric – 10 mL/kg bolus IV, reassess and repeat if necessary

- In hyperglycemic patients who have end tidal values < 30 mmHg strongly suspect metabolic acidosis secondary to DKA – these patients are frequently accompanied by K+ changes

  - Do not treat elevated K+ levels unless patient exhibits ECG changes with severe hypotension (See Calcium Gluconate Protocol)
    - K+ follows glucose. Treatment for elevated K+ is lowering Glucose levels in the hospital setting.
- Treat abdominal pain, nausea and vomiting per protocol as needed.

(CONTINUED)

HYPERGLYCEMIA

SPECIAL PRECAUTIONS

- Overly aggressive fluid administration in hyperglycemic patients may cause cerebral edema or dangerous hyponatremia. Cerebral edema is the leading cause of death in children with DKA, but is very rare in adults.
  - Closely monitor for signs of altered mental status or increased ICP – immediately discontinue fluids and raise head of the bed if possible
  - Reassess and manage airway as needed
- Asymptomatic hyperglycemia poses no risk to the patient while inappropriately aggressive interventions to manage blood sugar may be harmful.

HYPOGLYCEMIA

DEFINITION

Symptomatic Hypoglycemia is defined by GCS < 15 AND blood glucose level:

- Adult: < 60 mg/dL
- Pedi > 1 month: Same as adult
- Neonate: < 40 mg/dL
  - Note: Oral Glucose is not indicated in neonatal patients

INFORMATION NEEDED

- History of event:
  - Onset
  - Confusion
  - Trembling
  - Seizures
- Last oral intake
- Medications and compliance (Insulin and other diabetic medications)
- Past medical history

SPECIFIC OBJECTIVE FINDINGS

- Mental status, level of consciousness
  - Assess for focal neurologic deficit
- Skin signs (pale and moist skin)
- BGL
  - Heel stick is preferred in newborns/infants
- Vital signs – notably tachycardia and hypotension
- Assess for sunken eyes (evidence of dehydration)
- Evaluate for presence of automated external insulin pump
  - For patients with an insulin pump, care is directed at treating hypoglycemia first, then turning off or disconnecting the pump

TREATMENT

ADULT

- Patient conscious & able to protect airway
  - Administer oral glucose or simple carbohydrate drink or food as tolerated initially, followed by complex carbohydrates
- Patient unconscious or unable to protect airway
  - Establish IV and draw baseline labs if possible
    - If unable to establish IV, consider IO access
  - Administer Dextrose per protocol
- Consider 12L ECG as Diabetes can mask cardiac symptoms
- Reassess vital signs (including mental status)
- Obtain Blood Glucose Level 15-20 minutes later if previously hypoglycemic and mental status has not returned to normal

(CONTINUED)

HYPOGLYCEMIA

PEDIATRIC

- Patient conscious & able to protect airway
  - Administer oral glucose or simple carbohydrate drink or food as tolerated initially, followed by complex carbohydrates
- Patient unconscious or unable to protect airway
  - Establish IV and draw baseline labs if possible
    - If unable to establish IV, consider IO access
  - Administer Dextrose per protocol
- Reassess vital signs (including mental status)
- Obtain Blood Glucose Level 15-20 minutes later if previously hypoglycemic and mental status has not returned to normal

SPECIAL PRECAUTIONS

- Patients can become combative and violent, use precaution (See Agitated Patient protocol)
- Assess for concomitant trauma
- Diaphoresis or hypothermia may be associated with hypoglycemia
- Hypoglycemia can mimic CVA
- Diet drinks do not contain sugar and will not have the desired effect
- Consider potential for intentional overdose of hypoglycemic agents
- Avoid overshoot hyperglycemia when correcting hypoglycemia. Administer dextrose in small doses until either mental status improves or maximum dose of dextrose has been administered per protocol

TREAT AND RELEASE

There are circumstances in which a patient may be treated and allowed to refuse transport to the hospital for further evaluation.

The following criteria must be met in these cases:

- Repeat glucose is > 80mg/dL
- Patient takes insulin or metformin without taking longer acting oral sulphunylurea agents (e.g. glipizide, glyburide etc.)
- Patient returns to normal mental status after receiving glucose/dextrose
- Patient or legal guardian refuses transport and EMS providers agree transport not indicated
- The patient must have a known history of generally well controlled diabetes and have no other current medical concerns.
- The patient must have immediate access to food and should begin eating prior to EMS departure.
  - Ideally carbohydrates and proteins (meat and cheese sandwich, etc.) for longer lasting blood sugar maintenance.
- The patient must have a competent caregiver or family member on location who is willing and able to stay with the patient for the next few hours to help monitor blood sugar levels.
- A clear cause of hypoglycemia is identified (e.g. a missed meal)

And,

- Medical control must be contacted and agree with patient/provider plan

Refusal form should be completed and signed for patients refusing transport for further evaluation.

(CONTINUED)

HYPOGLYCEMIA

TRANSPORT IS ALWAYS INDICATED FOR THE FOLLWING PATIENTS:

- Patients with unexplained hypoglycemia
- Patients who had a seizure during episode
- Patients taking long-acting oral sulphunylurea – (ex glipizide, glyburide)
  - Sulfonylureas have extremely long half-lives ranging from 12-60 hours. Patients with corrected hypoglycemia who are taking these agents are at a particular risk for recurrent symptoms and frequently require hospital admission.
- Patients not taking food by mouth
- Patients who do not have competent adult to monitor
- Patients who received an IO for dextrose administration (prophylactic antibiotics)

INFECTIOUS DISEASE

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR USE WITH THE SUSPECTED INFECTIOUS DISEASE PATIENT

Medics who will directly care for a patient with possible or known infectious disease or who will be in the patient care compartment with the patient should follow standard precautions and use PPE below:

FOR SUSPECTED INFECTIOUS DISEASE PATIENTS:

- N-95. PAPR or higher-level respirator or facemask (if a respirator is not available)
- Eye protection (i.e., goggles or disposable face shield that fully covers the front and sides of the face).
- Personal eyeglasses and contact lenses are NOT considered adequate eye protection.
- Gloves
- Gown (if shortage, prioritize use for aerosol-generating procedures, or high-contact patient care)
- Full standard uniform underneath the PPE ensemble.

Drivers – if designated to drive only and not involved in patient care:

- If providing direct patient care (e.g., moving patients onto stretchers), they should wear all recommended PPE
- After completing patient care and before entering the driver's compartment, the driver should remove and dispose of PPE and perform hand hygiene to avoid soiling the compartment.
- The vehicle operator should wear at a minimum a surgical mask, but are welcome to use their own judgement and use an N-95 if they prefer especially if the patient compartment and cab cannot be isolated.

GENERAL APPROACH

RESPONSE

- Response will depend on patient condition. In general, use common sense, don proper PPE, and keep the number of responders to a minimum.

Patients who have suspicious infectious disease symptoms, meet criteria for possible exposure, or have been flagged by dispatch as potential exposure risk (ID Alert).
• Limit number of responders entering premises: A single paramedic in full PPE should make initial contact and assessment, unless aid is required in rendering medical care. Initial assessment/questioning should be made from a distance of 6ft or greater. • Done proper PPE (N95 mask, gown, boots, and gloves). Patient should be given surgical mask and instructed on use if they are able to tolerate it. • Treat medical conditions and comorbidities per usual with an eye to limiting droplet exposure (e.g. limit nebulizer or suctioning use) • Obtain temperature and RA SaO2 on all patients in addition to standard assessment. • Transport patients with decreased SaO2, respiratory difficulties, or other symptoms requiring treatment. • Screen and treat for sepsis.

(CONTINUED)

INFECTIOUS DISEASE

Transporting the potentially infected patient.

- Limit number of responders caring for patient; use proper PPE and droplet precautions.
- Consider having the patient compartment exhaust vent on high and isolating the driver compartment if performing aerosol producing procedures (airway suctioning, intubation, aerosolized medication administration).
- Advise receiving facility as soon as possible that patient may require ID precautions.
- Do not remove PPE; decontaminate ambulance and remove PPE per standard guidelines after all cleaning is complete.
- Decontaminating ambulance: Clean visible soil and then disinfect with McKesson Disposable Germicidal Wipes or Peroxi-4D, per manufacturer's recommendation, over all exposed surfaces. Use the same technique for any equipment that touched patient such as stethoscope, thermometer, BP cuff, etc. Spray ambulance with Clorox 360 as indicated by manufacturer.

NAUSEA

APPROACH

Nausea and associated vomiting can originate from a variety of sources. Through thorough assessment and a detailed history, the medic should be able to determine a likely source of nausea and treat accordingly.

Keep in mind that nausea and vomiting are always a symptom of an underlying, potentially life threatening, illness and the medic should assess and treat accordingly.

Recognize that there is no one treatment that fits all sources. Each potential source that stimulates the vomiting center of the brain uses different and, in some cases, multiple neurotransmitters to do so. Treatment should be targeted at the appropriate neurotransmitters in order to provide effective relief to the patient.

First make every effort to obtain a likely differential diagnosis as to the source of the nausea and vomiting.

Using the reference guide on next page, determine the primary treatment medication for the patient presentation and administer medication per protocol.

Some conditions may have multiple sources. Should initial treatment not provide effective relief, you may augment with Droperidol as a second line medication. If Droperidol was the first line medication initiated, consider Lorazepam as a second line broad spectrum antiemetic.

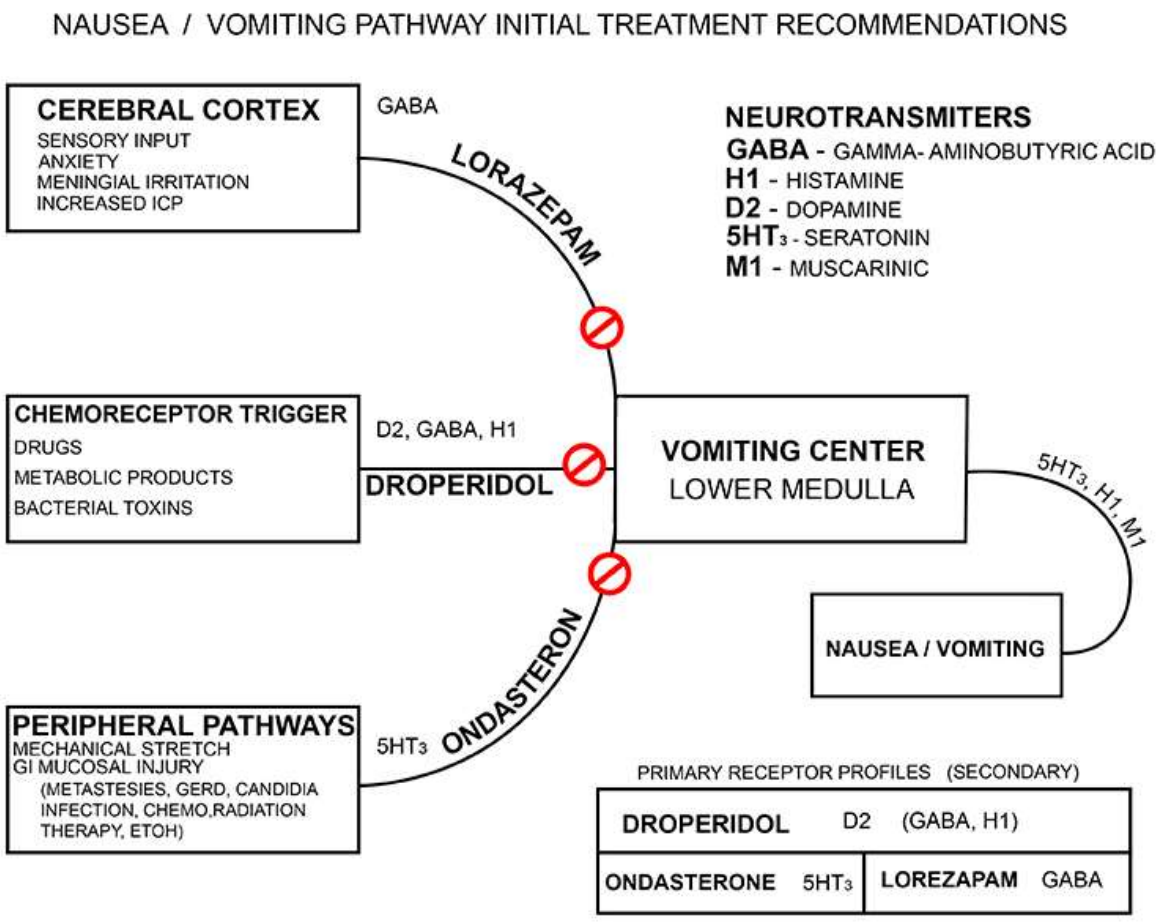
PRECAUTIONS

- Caution should be taken when administering Droperidol as it has the potential for extrapyramidal side effects or to exacerbate prolonged QT syndrome.

- **It is not the goal of antiemetic therapy to induce deep sedation as the combination of sedation and a history of vomiting may compromise the patient's airway; however when administering an antiemetic and either an opioid, additional benzodiazepine, or second line antiemetic, the patient should be monitored carefully as any combination of these may potentially induce sedation. Monitoring should include frequent BP, ETCO2 (for accurate RR), and cardiac monitor. The patients Qtc should be documented on every patient receiving Droperidol. Instances of Qtc over 500 should be reported to the receiving facility. In addition, maintain head position to ensure adequate airway and have suction readily available.**

NAUSEA TREATMENT RECOMMENDATION CHART ON NEXT PAGE

NAUSEA TREATMENT PATHWAYS



NEONATAL RESUSCITATION

GENERAL INFORMATION

- Some newborns without any apparent risk factors will require resuscitation, including assisted ventilation. Unlike adults, who experience cardiac arrest due to trauma or heart disease, newborn resuscitation is usually the result of respiratory failure, either before or after birth. The most important and effective action in neonatal resuscitation is to ventilate the baby's lungs. Very few newborns will require chest compressions or medication. Prolonged lack of adequate perfusion and oxygenation can lead to organ damage. Resuscitation should proceed quickly and efficiently; however, ensure that you have effectively completed the steps in each block of the Neonatal Resuscitation Program Flow Diagram before moving to the next. Teamwork, leadership, and communication are critical to successful resuscitation of the newborn.

NOTE: This protocol is to be used in conjunction with OB-GYN Active Labor protocol.

Postpartum Care infant

- Vigorous: Delayed cord clamping at 30-60 seconds post-delivery
  - Clamp cord with two clamps approximately 8 inches from infants abdominal wall and cut between the clamps with a sterile instrument
- Not vigorous (or if anything not right) clamp cord immediately
  - In cases of suspected placental abruption delayed cord clamping is contraindicated
- Access:
  - Term?
  - Tone?
  - Breathing or crying?
- Given term, good tone, breathing well, baby placed with mother for skin-skin warming.
- Position head/neck
- If secretions or meconium, provide suction (mouth before nose ("M" before "N")
- Dry infant
  - <32 weeks cover in polyethylene plastic (don't dry, but do provide stimulation)
  - Keep infant warm using head covering and heat pad
- Stimulate

Respirations should begin within 30 seconds after stimulating

- Place pulse ox (pre-ductal on R hand or wrist). Pre-ductal O_2 target @ 1 min 60% should go up by 5% every minute until 5 minute mark (see chart)
  - Keep in mind, pulse ox is often not reliable in the immediate newborn period and should be secondary to monitoring HR.
- HR – determine by auscultation (6 sec *10, tap it out). If can't determine, use ECG monitor leads
- If HR not >100 @ 1 min, start PPV
- PPV: Rate 40-60 BPM with PEEP setting of 5, pop off pressure 40
  - If baby > 35 weeks, use 21% O_2 (room air)
  - If baby < 35 weeks, use 21-30% O_2
- Check heart rate 15 seconds after starting PPV, if increasing continue until heart rate reaches 100 BPM
  - If heart rate is not increasing after 15 seconds of PPV – "MR SOPA" – see chart below
- If heart rate is below 60 BPM after 30 seconds of PPV, intubate if not already done and bag for an additional 30 seconds begin chest compressions @ rate of 90-100 per minute after 30 seconds of effective PPV via ETT and HR remains < 60.

(CONTINUED)

NEONATAL RESUSCITATION

Table 4-2. The 6 Ventilation Corrective Steps: MR. SOPA

	Corrective Steps	Actions
M	Mask adjustment.	Reapply the mask. Consider the 2-hand technique.
R.	Reposition airway.	Place head neutral or slightly extended.
	Try PPV and reassess chest movement.	
S	Suction mouth and nose.	Use a bulb syringe or suction catheter.
O	Open mouth.	Open the mouth and lift the jaw forward.
	Try PPV and reassess chest movement.	
P	Pressure increase.	Increase pressure in 5 to 10 cm H_2O increments, maximum 40 cm H_2O.
	Try PPV and reassess chest movement.	
A	Alternative Airway	Place an endotracheal tube or laryngeal mask.
	Try PPV and assess chest movement and breath sounds.	

- Indications for Epinephrine administration = heart below 60 BPM after 30 seconds of PPV followed by 60 seconds of chest compressions
- Epinephrine 1:10000 is administered IV at a dose of 0.02 mg/kg
    - If heart rate persists below 60 bpm despite adequate ventilations and good chest compressions consider hypovolemia or pneumothorax
- After 1 minute of PPV an 8F OG tube should be inserted as soon as possible

INTUBATION GUIDELINES

Gestational age in weeks	Uncuffed tube size	Laryngoscope blade
< 28 weeks	2.5	00
28-34 weeks	3.0	0
> 34 weeks	3.5	1

Initial endotracheal tube insertion depth ("tip to lip")

Gestation (weeks)	Endotracheal tube insertion depth at lips (cm)
23-24	5.5
25-26	6.0
27-29	6.5
30-32	7.0
33-34	7.5
35-37	8.0
38-40	8.5
41-43	9.0

After insertion confirm breath sounds in both axillae and auscultate over the stomach for negative epigastric sounds as well positive waveform end tidal capnography.

(CONTINUED)

NEONATAL RESUSCITATION

VASCULAR ACCESS

- **IO access - distal femoral access** is the recommended site (see 1120 IO protocol)
- **Scalp vein catheterization** may also be considered as a last resort

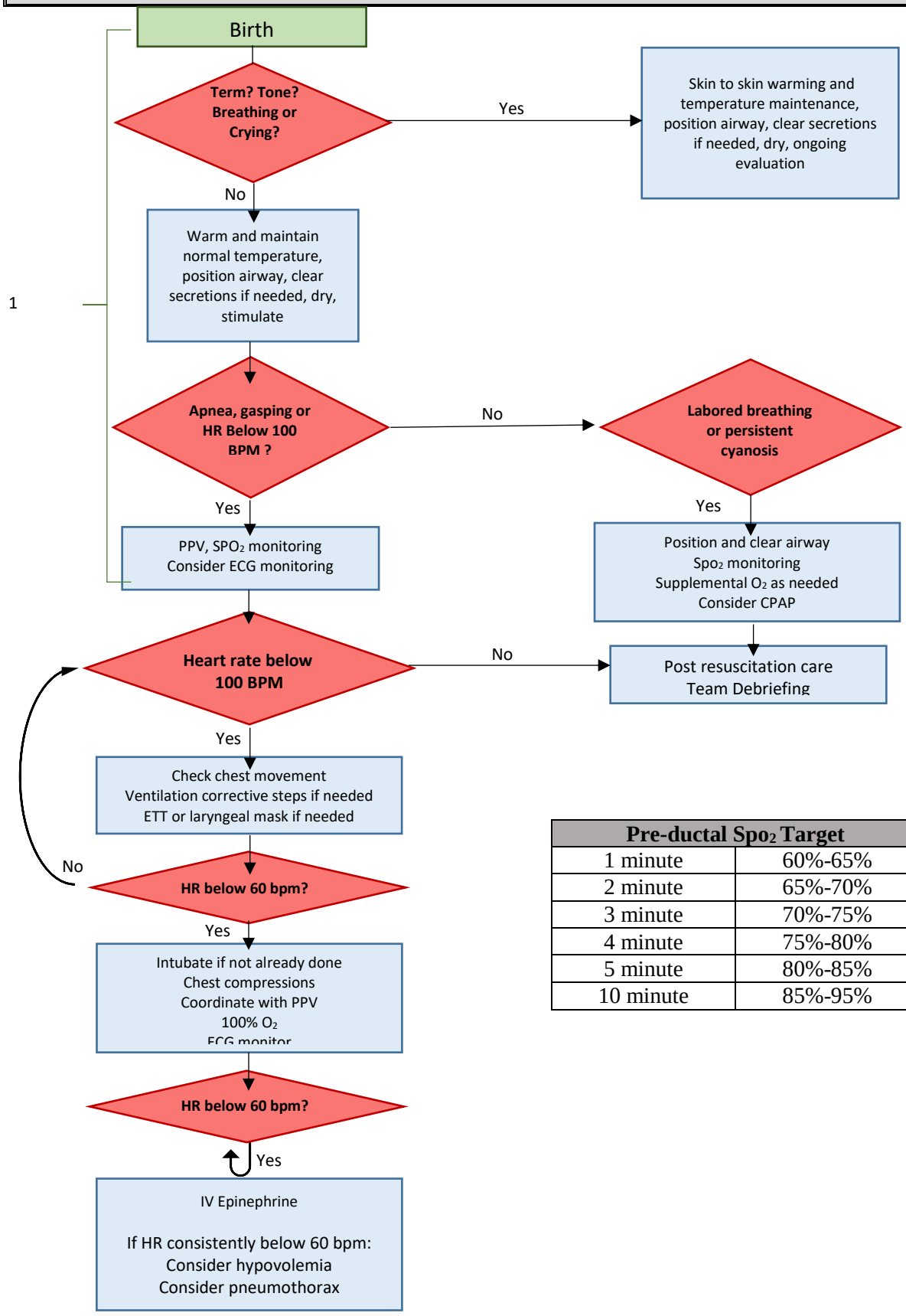
GLUCOSE CHECK

Glucose consumption is increased when metabolism occurs without adequate oxygenation. Hypoglycemia may occur because limited glucose stores are depleted very rapidly during perinatal stress.

- A blood sample for glucose testing should be obtained for all infants following resuscitation. The sample should be obtained from the heel of the infant.
- A blood glucose **< 40 mg/dL** should be treated with administration of D10 2 mL/kg (See 6100 Dextrose protocol)

(CONTINUED)

NEONATAL RESUSCITATION



Pre-ductal Spo_2 Target	
1 minute	60%-65%
2 minute	65%-70%
3 minute	70%-75%
4 minute	75%-80%
5 minute	80%-85%
10 minute	85%-95%

Obstetrical Complications

For all patients with obstetrical complications

- Do not delay: immediate rapid transport
- Give high flow O2
- Start IV en route if time and conditions allow. Treat signs of shock with IV fluid boluses per protocol.

Possible actions for specific complications (below)

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

Complications of Late pregnancy

Third Trimester bleeding (6-8 months)

- Anticipate possible imminent delivery and assess for this often.
- 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
- Treat for hemorrhagic shock
- Establish a 2nd large bore IV + crystalloid fluid bolus

Pre-eclampsia/Eclampsia

- Elevate patient's head 6-12 inches
- High flow O2 via NRB,
- IV access
- SBP > 140, DBP > 90, peripheral edema, headache, seizure, visual changes, right upper quadrant abdominal pain
- Hand and face edema may suggest preeclampsia. Foot edema is common in pregnancy.
- A preeclamptic patient may be intravascularly depleted (from third spacing fluid), or they may be volume overloaded and at risk for pulmonary edema. Before giving IV fluid, ensure they have been having good urine output.
- Transport position of comfort
- If BP > 160/110, or patient has a seizure, treat with 4 G magnesium sulfate IV, followed by 2g/hr.
- Consider Lorazepam or Midazolam if refractory to above treatments

Preterm labor, premature rupture of membranes

- Defined as labor or amniotic rupture prior to 37 weeks gestation
- Anticipate possible imminent delivery and assess for this often.

(CONTINUED)

Obstetrical Complications

- True contractions are often difficult to determine by history or exam, but if the patient is experiencing forceful contractions up to every 5 minutes or greater or has had a substantial loss of fluid per vagina, consider the patient to be experiencing preterm labor.
- Administer IV crystalloid fluids
- Give bolus and placing the patient on her left lateral recumbent position.
- Consult medical control as to destination and medication orders including Magnesium Sulfate 2-4 grams IV for tocolysis.
- Avoid Magnesium Sulfate if the patient is having heavy bleeding associated with the contractions.

Complications during delivery

Prolapsed Umbilical Cord

- Umbilical cord presents before infant
    - Dire emergency for the infant
    - Discourage pushing by mother
    - Place mother in knee-chest position.
    - Palpate cord for pulses
    - Place gloved hand in mother's vagina and elevate the presenting fetal part off of cord until relieved by physician. This is essential for infant survival. Do not attempt to replace cord.
    - Keep cord moist and warm.
    - Notify hospital early to prepare for emergency C-Section. Emergent transport.

Breech Presentation

- Any part of infant presenting before the head does
    - Place mother in knee-chest position and transport.
    - Discourage pushing
    - 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
    - Never apply pressure to the uterine fundus (top of uterus). Suprapubic pressure can be applied if necessary to flex head during delivery.
    - IF infant delivered see childbirth protocol – Postpartum care of infant and mother
    - Arm or single foot presentation will require a C-Section.

(CONTINUED)

Obstetrical Complications

Shoulder Dystocia

- After delivery of baby's head, the baby's anterior shoulder gets caught above the mother's pubic bone – Watch for retraction of baby's head back into vagina ("turtle sign")
  - Support baby's head
  - Suction oral and nasal passages
  - DO NOT pull on head
  - To facilitate delivery, bring the mother's knees up to her armpits in an open-legged position; hang her hips off the bed to remove any pressure on the baby's body, and push very firmly just superior to the pubic bone to attempt to dislodge the stuck shoulder.
  - If infant delivered see childbirth protocol – Postpartum care of infant and mother

Complications post delivery

Continued Bleeding After Delivery

- If the patient is having heavy vaginal bleeding and the placenta has not been delivered, consult medical control and consider delivery of the placenta
  - Placental delivery is performed by using one hand to apply downward pressure to the uterus and the other gently applying downward traction on the cord.
- Massage uterus until firm (Fundal Massage) and encourage mother to attempt breast-feeding her newborn to help get the uterus to contract and reduce post-partum bleeding.
  - Fundal massage is performed by finding the superior boarder of the uterus on palpation of the abdomen and massaging it. The mother will find this uncomfortable if it is done correctly, causing uterine contractions and slowing blood loss
- Other causes for bleeding may include vaginal lacerations. Direct pressure should be applied with sterile gauze.
- If fundal massage and other treatments for shock are ineffective at maintaining a systolic > 90 and delivery has occurred with the last two hours consider TXA.
- Consult **medical control** for postpartum bleeding that is not controlled by the above techniques and continue rapid transport, treating shock if present.

SPECIAL PRECAUTIONS

- Amount of vaginal bleeding is difficult to estimate. Try to get an estimate of number of saturated pads in previous 6 hours.
- A patient in shock from vaginal bleeding should be treated like any other patient with hypovolemic shock, consider TXA if all other treatments fail to stabilize the systolic B/P.
- If patient is pregnant, bring in any tissue which was passed. Laboratory analysis may be important in determining status of pregnancy.
- Always consider pregnancy as a cause of vaginal bleeding. The history may contain inaccuracies, denial, or wishful thinking.

SEIZURE

INFORMATION NEEDED

- History of event from witnesses
  - Duration of current seizure
  - Loss of consciousness
  - Focality of onset, direction of eye deviation
  - Concurrent symptoms of apnea, cyanosis, vomiting, bowel/bladder incontinence, or fever
  - Bystander administration of medications to stop seizure
  - History of trauma, pregnancy, heat exposure or toxin exposure
- Medical history**:**
  - Prior history of seizure, diabetes, hypoglycemia
  - Typical appearance of seizure
  - Baseline seizure frequency and duration
  - Alcohol abuse / withdrawal
  - Current medications including anticonvulsants
  - Recent dose changes or non-compliance with anticonvulsants
  - Headache
  - OTC and illicit drug use
- Seizures with suspected cause of *trauma*, *pregnancy*, *hyperthermia* *or* *toxin exposure* should be managed according to those condition specific protocols

SPECIFIC OBJECTIVE FINDINGS

- Consider patients to be in status epilepticus if they are actively seizing upon arrival.
- Altered mental status, post-ictal state
- Signs of trauma including shoulder dislocation
- Trauma to tongue is unlikely to cause serious problems, however, trauma to teeth may. Attempts to force an airway into the patient's mouth can completely obstruct airway. Do not use bite sticks or jaw screws.
- Neuro exam including pupils, extra-ocular movements, motor, sensory, speech, and if possible, gait.
- Environmental clues**:**
  - Pills, Alcohol, or Chemical bottles / containers- bring pill bottles to hospital if possible.

TREATMENT

- Assure and maintain a patent airway and appropriate oxygenation.
- Apply SpO2 and EtCO2 ASAP to evaluate oxygenation/ventilation
- Administer oxygen as appropriate with a target of achieving 94-98% saturation. Use BVM if oxygenation/ventilation are compromised
- Access perfusion
- Assess mental status
- *Midazolam* *per protocol* is indicated immediately in the actively seizing patient
  - There should be NO delay of benzodiazepine therapy in order to obtain IV/IO access
- Monitor Vital Signs
- Obtain Blood Glucose Level
- Monitor Cardiac Rhythm – especially in seizure without previous history
- IV placement is not necessary for treatment of a single self-limiting seizure, but can be obtained if needed for recurring seizure or other reasons
- Consider intubation if signs of respiratory depression
- If seizure persists despite the measures listed below, consider alternative causes and rapidly transport to hospital
- Monitor carefully for continued seizure activity and treat accordingly
-

(CONTINUED)

SEIZURES

- **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 months to 6 years old)

IN THE ACTIVELY SEIZING PATIENT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	CCP
ADULT: Initial treatment: Midazolam (Versed): 5 - 10 mg IV/IM/IN (Repeat once after 5 minutes prn)	--	**SO** ***Intranasal ONLY**	**SO**	**SO**	**SO**
Lorazepam may be given if midazolam unavailable: Lorazepam 2-4 mg IV/IM (Repeat after 5 minutes PRN)	--	--	**SO**	**SO**	**SO**
PEDIATRIC: Initial treatment: Midazolam 0.2mg/kg (max 10 mg) IV/IM/IN (Repeat once after 5 minutes PRN)	--	**SO** ***Intranasal ONLY**	**SO**	**SO**	**SO**
Lorazepam may be given if midazolam unavailable: Lorazepam 0.1 mg/kg IV/IM (Repeat after 5 minutes PRN)	--	--	**SO**	**SO**	**SO**
If later in pregnancy (≥20weeks) or post-partum up to 6 weeks Magnesium Sulfate 2gm IVP	--	--	**SO**	**SO**	**SO**

(CONTINUED)

SEIZURES

SPECIAL PRECAUTIONS

- The presence of fever with seizure in children less than 6 months old and greater than 6 years old is not consistent with a simple febrile seizure, and should prompt evaluation for meningitis, encephalitis, or other cause.
- Move hazardous materials away from patient. Restrain the patient only if needed to prevent injury. Protect patient's head.
- Be aware of associated trauma as either the cause of the seizure or as a result from falling. Obtain this part of the history from witnesses, if present.
- Be careful not to over-treat any patient who is conscious and having seizure-like activity. If this activity is not subsiding with the above treatment, insure your safety as well as the patients', and begin transport.
- Seizure can be due to lack of glucose or oxygen to the brain, as well as to the irritable focus we associate with epilepsy. Hypoxia from transient arrhythmia or cardiac arrest (particularly in younger patients) may cause seizure and should be treated promptly. Always check for pulse once a seizure terminates.
- Hypoxic seizures can also result when the tongue obstructs the airway in the supine position, or when overly helpful bystanders prop the patient up or improperly elevate the head.
- Alcohol-related seizures are common, but cannot be differentiated from other causes of seizure in the field. Assessment in the intoxicated patient should still include consideration of hypoglycemia and all other potential causes. Field management is as for any seizure.
- Seizures may be due to arrhythmias or stroke. It is important to look for and recognize arrhythmias in the field since they may be the cause of the seizure.
- Medical personnel are often called to assist epileptics who seize in public. If a patient clears completely, is taking medications prescribed by his/her own physician, and is experiencing the usual frequency of seizures, and has competent adult supervision, transport may be unnecessary. Consult medical control.
- Midazolam has a tendency to decrease respiratory effort, therefore be prepared to assist ventilations.

SEPSIS

In severe sepsis, the balance between the body's inflammatory, and anti-inflammatory responses becomes disjointed and an uncontrolled systemic inflammatory response known as SIRS (systemic inflammatory response syndrome) can rapidly cause the patient to deteriorate. Rapid recognition, fluid resuscitation, and antibiotic therapy are the immediate goals for treatment.

To that end, EMS is uniquely placed to provide immediate front-line care to the SIRS patient and significantly shorten the time to antibiotic therapy.

SEPSIS ALERT FINDINGS

- History suggestive of infection
  - Pneumonia
  - Urinary tract infection
  - Acute AMS change
  - Blood stream / catheter related
  - Abdominal pain
  - Wound infection
  - Skin/soft tissue infection

AND

- AT least **2** of the following SIRS criteria:
  - Temperature >100F (38C) or <96F (36C)
  - Pulse >90
  - Resp rate >20 or mechanical ventilation

AND

- Hypo-perfusion as manifested by one of the following:
  - Systolic BP <90
  - MAP <65
  - Altered mental status

TREATMENT

The ultimate goal in the emergency care of the septic patient is to achieve the shortest time possible to initiation of antibiotic therapy. To that end, the patient should have the following steps completed before initiating transportation to the ED.

- Oxygen adequate to SaO2 >94%
- Trend vital signs including EtCO2
- 12 Lead ECG
- Obtain BGL
- Venous access (2 sites preferred)
  - Draw 1st set of Blood Cultures (2 are preferred if possible)
  - Draw full set of labs
  - Initiate fluid bolus 1000mL NS may repeat if necessary

- If patient is not currently being treated with antibiotics for this finding, initiate appropriate antibiotic therapy;
- *See 6390 Rocephin protocol*
- Notify receiving facility of Sepsis Alert
- Septic shock may be refractory to fluid bolus *(see 2270 Shock-Medical)*

SHOCK - MEDICAL

INFORMATION NEEDED

- Past Medical History
- Medications
- History of present illness

SPECIFIC OBJECTIVE FINDINGS

- **Vital signs in Compensated Shock**
  - Tachycardia
  - Tachypnea
  - Blood pressure ≥ 90 mmHg
  - EtCO2 > 20 mmHg
- **Vital signs in Decompensated Shock**
  - Tachycardia
  - Hypotension
  - Altered Mentation
    - Confusion
    - Anxiety
    - Restlessness
    - Apathy
    - Combativeness
    - Stupor
    - Coma
  - Skin
    - Pale
    - Dusky
    - Ashen
    - Cyanotic
    - Diaphoretic
  - EtCO2 < 20 mmHg

TREATMENT

- Assure and maintain patent airway
- Administer Oxygen
- 12 Lead ECG and monitor vital signs
- Check Breath Sounds
- Establish large bore IV access
  - Consider 2nd line if acutely symptomatic
  - IO access if unable to obtain IV access and patient is symptomatic
- Fluid bolus 20 mL/kg (initial)
  - Reassess and repeat as necessary
- Consider and treat underlying etiology as appropriate

(Continued)

SHOCK - MEDICAL

SPECIFIC EMERGENCIES

Emergency	Signs & Symptoms	Treatment
Allergies / Anaphylactic Shock • Severe allergic reaction causes edema to the airway. • Changes in vascular permeability cause hypotension	• Hives. • Uticaria. • Edema to lips and face. • Dyspnea. • Wheezes. • Diminished breath sounds. • Hypotension	• Benadryl • Epinephrine • SoluMedrol *See 2060 Allergy/Anaphylaxis protocol*

Cardiogenic Shock
• A weakened heart is unable to pump the blood to meet the body's needs.
  ○ Acute AMI
  ○ Acute CHF
	• Tachycardia / Bradycardia.
	• JVD.
	• Dyspnea.
	• Rales.
	• Peripheral Edema.
	• Consider Tension Pneumothorax
		• Position of comfort – usually sitting upright
		• Fluid bolus
		• Consider Epinephrine push dose and/or infusion if unresponsive to fluids
		• Evaluate and treat dysrhythmias per protocol
		  ○ *2085 Bradyarrhythmias*
		  ○ *2080 Tachyarrhythmias*

Hypovolemic / Hemorrhagic • Dehydration • G.I. Bleed • Nausea/Vomiting/Diarrhea • Ruptured ectopic pregnancy • Postpartum Hemorrhage	• Weakness • Confusion • Tachypnea • Tachycardia • Orthostatic changes • Peripheral vasoconstriction	• Fluid bolus to blood pressure equal to or greater than 90 mm/Hg systolic • Consider TXA ○ *6430 TXA protocol* • Rapid Transport

Sepsis
• Systemic bacterial infection causes vasodilation and vessel wall instability.
	• **Early:**
	  ○ Vasodilation.
	  ○ Warm, flushed skin.
	  ○ Tachycardia/tachypnea
	  ○ Blood Pressure is normal to slightly decreased.
	• **Late:**
	  ○ Cool, pale, and cyanotic skin.
	  ○ Tachypnea with pulmonary edema.
	  ○ Tachycardia.
	  ○ Hypotension.
		• Fluid challenge if hypotensive
		• Antibiotics per protocol
		  ○ *6390 Rocephin Protocol*
		• Consider Epinephrine push dose and/or infusion if unresponsive to fluids.
		• *See 2260 Sepsis protocol*

(Continued)

SHOCK - MEDICAL

PEDIATRIC CONSIDERATIONS:

- 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
- Signs of Compensated Shock (Pediatric)
  - Normal mental status
  - Normal systolic blood pressure
  - Tachycardia
  - Tachypnea
  - Prolonged (>2 seconds) capillary refill
  - Cool and pale distal extremities
  - Weak peripheral pulse
  - EtCO2 > 20 mmHg
- Signs of Decompensated Shock (Pediatric)
  - Decrease mental status
  - Weak central pulses
  - Poor color
  - Hypotension for age
  - EtCO2 < 20 mmHg

Hypotension for age

AGE	BLOOD PRESSURE
< 1 YEAR	< 70 mmHg
1-10 YEARS	< 70 + (2 x age in years) mmHg
>10 YEARS	< 90 mmHg

Tachycardia by age

AGE	HEART RATE
< 1 YEAR	> 160
1-2 YEARS	> 150
2-5 YEARS	> 140
5 – 12 YEARS	> 120
> 12 YEARS	> 100

SPECIAL PRECAUTIONS

- Patients on cardiac and blood pressure medications such as Beta-Blockers may not be able to show signs of shock. Watch for relative changes in vital signs
- Orthostatic changes in vital signs indicate hypovolemia.

SYNCOPE

INFORMATION NEEDED

- History of event
  - Onset
  - Events prior to syncopal episode
  - Duration of loss of consciousness
  - Altered mental status upon awakening
- Seizure like activity (with loss of consciousness or after loss of consciousness?)
- Precipitating factors
  - Was the patient sitting, standing, lying down
  - Is the patient pregnant
- Past medical history
- Medications
- Trauma

SPECIFIC OBJECTIVE FINDINGS

- Associated Symptoms
  - Vertigo
  - Nausea
  - Chest or abdominal pain
  - Vomiting blood
  - Vaginal or rectal bleeding
  - Diarrhea
  - Fever
  - Heat exposure

TREATMENT

- Assure and maintain patent airway
- Rule out / treat hypoxia
  - Oxygen
- Rule out / treat hypoglycemia
  - Administer Dextrose 10% (D10) if blood sugar is less than 60 mg/dL or with associated symptoms – see 6100 dextrose protocol
- Monitor Vital Signs
  - Orthostatic may be warranted
- 12 Lead ECG
- Treat underlying conditions as appropriate
- Establish IV.
  - Consider fluid bolus

COMMON 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

(CONTINUED)

SYNCOPE

SPECIAL PRECAUTIONS

- 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. If the patient is still unconscious or has an altered mental status, treat the underlying condition.
- **ALL syncope/near syncope events are considered cardiac events until proven otherwise**
- Syncope which occurs without warning or while in a recumbent position is potentially serious, and may be caused by a ventricular arrhythmia.
- Any elderly patient with syncope and back pain should be considered to have an aortic aneurysm until proven otherwise.
- Elderly syncope has a high risk of morbidity and mortality
- 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.
    - In seizure loss of consciousness happens with the start of seizure activity – in true syncopal episodes loss of consciousness PRECEDES the seizure like activity
- Place patient on continuous cardiac monitoring while transporting.
- All patients who experience a syncopal/near syncopal episode should be encouraged to go to the ED for further evaluation

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 (see 2250 seizure protocol)
    - Breath holding spells
    - Toxins (marijuana, opioids, cocaine, CO, etc.) (see 2290 toxins and overdoses protocol)
    - Heat intolerance
    - BRUE (Brief Resolved Unexplained Events, formerly ALTE) (See 5000 BRUE Protocol)
- Important historical features of pediatric syncope include:
    - color change
    - seizure activity
    - incontinence
    - post-ictal state
    - events immediately prior to syncope event

TOXINS and OVERDOSES

INFORMATION NEEDED

- Method of exposure:
  - Ingestion.
  - Inhalation.
  - Injection.
  - Absorption.
- What substance: milligrams of each tablet, number of tablets, total amount in bottle.
- How long ago.
- How long was the exposure, was patient in confined space.
- Estimated weight of the patient (obtain from family or friends if patient unable to respond).

SPECIFIC FINDINGS

Type of Drug	Effects	Signs & Symptoms	Special Considerations Treatment
Alcohols: • Overdose • Chronic Abuse • Ethylene glycol, methanol (antifreeze, windshield fluid)	• CNS Depression • GI Bleed • Liver Failure	• Slurred Speech • Ataxia • Altered LOC • Respiratory Depression • Malnutrition	• Risk of vomiting / aspiration. • Protect Airway • Suspect Trauma • Use caution with administration of medications
Aspirin	• OTC • Analgesic • Anti-inflammatory • Anti-coagulant	• Tinnitus • Lethargy • Nausea • Dyspnea • Tachypnea • Seizures • Pulmonary Edema • Diaphoresis	• Assure proper oxygenation • GI Bleed
Acetaminophen: • Tylenol • Sominex • Nyquil	• OTC Analgesic • Sleep / Cold medications.	• Nausea & vomiting. • abdominal pain • Symptoms may be delayed 12 – 24 hours.	• Liver failure within 72 to 96 hours. • Common in suicidal overdoses • chronic toxicity
Barbiturates: • Phenobarbital • Quaaludes	• CNS depressant. • Sedative. • Anti-convulsant	• Slurred speech. • Respiratory depression	• Alcohol will exaggerate the sedative effects • Supportive care

(Continued)

TOXINS and OVERDOSES

Type of Drug	Effects	Signs & Symptoms	Special Considerations Treatment
Benzodiazepines: • Valium • Ativan • Clonopin • Xanax	• CNS depressant • Tranquilizer	• Sedation • Slurred speech • Altered LOC • Dilated pupils • Respiratory Depression	• Supportive care • Alcohol will exaggerate the sedative effects • Withdrawal may occur- seizures
Anticholinergics • Antidepressants • Antihistamines (including diphenhydramine) • Antiparkinsonian drugs • Antipsychotics • Several plants	• Central and peripheral Cholinergic blockade • Muscarinic antagonist	• Blind as a bat • Mad as a hatter • Dry as a bone • Red as a beet • Hot as a hare • Sinus tach is common	• Supportive measures • See 2030 agitated patient protocol
Caustic Substances: • Drano • Detergent • Gasoline • Ethylene glycol	• Acid & Alkaline • Petroleum Products • Anti-freeze	• Tissue burns • Dyspnea • Pulmonary edema • Vomiting • GI Bleed	• Airway management is a priority • Do not induce vomiting • Brush powders from skin • Flush with copious amounts of water
Hallucinogens: • LSD • Peyote • Mescaline • PCP	• Causes auditory and visual disturbances	• Headaches • Psychosis • Dilated pupils • May have increased temperature (PCP)	• Protect self • Patient may be violent • Check for secondary trauma • See 2030 agitated patient protocol
Narcotics / Opiates: • Heroin • Morphine • Darvon • Demerol • Dilaudid	• Narcotic analgesics • CNS depressants	• Sedation • Pin-point pupils • Respiratory depression • Bradycardia • Pulmonary edema • Hypothermia	• Reverse with Narcan if respiratory drive compromised (see 6290 naloxone protocol) • Patient may become violent with rapid or excessive administration

(Continued)

TOXINS and OVERDOSES

Type of Drug	Effects	Signs & Symptoms	Special Considerations
Organophosphates: • Paraquat • Insecticides • Fertilizers	• Systemic cholinergic	• SLUDGE syndrome • Pulmonary edema. • Cardiovascular effects. • Seizures. • Coma.	• Personal Protective Equipment is critical for safety of crews • See 6060 atropine protocol
Stimulants: • Cocaine • Amphetamines • Crack & Crank • Bath Salts • Designer drugs • Diet herbal supplements	• CNS Stimulants • Appetite Suppressant	• Tachyarrhythmias • Dyspnea • Increased body temperature • Dehydration	• Supportive measures • See 2030 agitated patient protocol
Tricyclic Antidepressants: • Elavil • Amitriptyline • Pamelor • Sinequan • Imipramine	• Prescription antidepressant causing sedation • Flushed skin	• Sedation • Anticholinergic response • Tachycardia • Hypotension • Cardiac dysrhythmias • Seizures • Metabolic acidosis	• Protect airway • See 6410 Sodium Bicarbonate protocol

TREATMENT

- **If there is a specific protocol for patients exposure/ingestion refer to that protocol for specifics**
- Remove patient from environment if it is safe, providers are trained, and correct level of PPE is available.
- Remove contaminated clothing.
- Brush/flush w/ sterile water, as indicated
- Assure and maintain a patent airway
- Suction airway if necessary. Prepare for vomiting. Prepare to CFI the patient that cannot maintain their airway patency.
- Oxygen
- Monitor Vital Signs
  - Check Breath Sounds
- Establish I.V.
  - Crystalloid fluids. Consider fluid bolus and second I.V
- Obtain Blood Glucose level- treat hypoglycemia per protocol
- Continuous cardiac, SpO2 and EtCO2 monitoring

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TOXINS and OVERDOSES

SPECIAL PRECAUTIONS

- Patients often take other substances which they do not disclose
- Medical conditions or associated trauma may complicate patient's presentation.
- Assess mental status and vital signs frequently.
- Attempt to establish patient's intent (i.e.: accidental, abuse, suicidal).
- Secure 0.5 mental health hold per protocol if indicated.
- Restraints may be indicated. Chemical is preferred over physical (see 2030 Agitated Patient Protocol).
- Bring all containers, pill bottles. Get as much information as possible.
- Contact Emergency Department as soon as possible. Decontamination in the field may be required. DO NOT contaminate providers or ambulance.

Resource Contact Information

- Rocky Mountain Poison Center #: 303-739-1123 or 1-800-332-3073 (statewide)
- Nationwide Poison Control Access#: 1-800-222-1222
- Poison Control Phone for Hearing Impaired: 303-739-1127
- CHEMTREC: 1-800-424-9300

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AVALANCHE

INFORMATION NEEDED

- Length of time the victim was buried
- Mechanism for trauma: cliffs, trees

SPECIFIC OBJECTIVE FINDINGS

- Vital signs, including temperature
- Signs of trauma
- Respiratory distress, cyanosis, altered mental status

TREATMENT

- Clear airway and keep patent with adjuncts as needed
- Keep warm and avoid further exposure
  - Victims of avalanche burial experience a rapid drop in core temperature after extrication from snow
- Administer oxygen
- Assist ventilations if needed
- Endotracheal intubation if not maintaining airway or signs of respiratory failure
- Establish IV and give warmed fluids, if available
- Rapid extrication

SPECIAL PRECAUTIONS

- **SCENE SAFETY - Do not enter avalanche terrain. Trained personnel will bring the patient to the ambulance crew.**
- Immobilize spine if indicated (See 1180 spinal motion restriction protocol)
- CPR should not be started on patients who have been buried for >35min, that did not have air pockets, or have snow or ice in their airway.
  - Most deaths occur in the first 15 minutes due to trauma or asphyxia. The rapid decline in survival over the next 20 minutes (15 to 35 minutes from the time of burial) reflect asphyxiation of victims with an obstructed airway. Hypothermia as cause of death occurs in <1% of patients.
- Treat for hypothermia and prevent heat loss (See 3070 Hypothermia/Frostbite protocol)

BITES AND STINGS

INFORMATION NEEDED

- Identification of type of animal or insect
- Timing of bite sting
- History of prior allergic reactions
- Treatment prior to EMS arrival (EpiPen, diphenhydramine, etc.)
- Symptoms:
  - Local: pain, stinging
  - Generalized: dizziness, weakness, itching, trouble breathing, airway swelling, muscle cramps

SPECIFIC OBJECTIVE FINDINGS

- Local signs: redness, swelling, heat in area of bite
  - Local signs may be treated with diphenhydramine (See 6110 diphenhydramine protocol)
- Systemic signs: hives, wheezing, respiratory distress, abnormal vital signs
  - Systematic signs should be treated per 2060 Allergy/Anaphylaxis protocol

TREATMENT

Snakes (See 3090 Snake Bite Protocol)

Spiders

- Ice for comfort
- Bring in spider, if captured and contained or if dead, for accurate identification, if possible
- Transport for observation if systemic signs and symptoms present
- Consider pain management per protocol (See 6150 Fentanyl Protocol)

Bees and Wasps

- Remove sting mechanism. Do not squeeze venom sac if this remains on stinger, rather, scrape with straight edge.
- Observe patient for signs of systemic allergic reaction. Transport rapidly if signs or symptoms of anaphylaxis and treat per protocol (See 2060 Allergy/Anaphylaxis protocol)
- Transport all patients with systemic symptoms or history of systemic symptoms from prior bites.

SPECIFIC PRECAUTIONS

- Many skin infections present as a small red lesion that is often attributed to an insect bite. If the redness or swelling is rapidly progressing, you palpate the skin and feel subcutaneous air, or the patient appears ill; immediate transport is indicated.
- For all types of bites and stings, the goal of prehospital care is to prevent further inoculation, treat allergic reactions and manage pain when indicated
- Allergy kits consist of injectable epinephrine and oral antihistamine, and are prescribed for persons with known systemic allergic reactions. Prehospital care personnel may assist w/ EPI-PEN per protocol.
- About 60% of patients who have experienced a generalized reaction to a bite or sting in the past will have a similar or more severe reaction upon re-inoculation. Although it is not inevitable, this group of patients must be considered at high risk for anaphylaxis. In addition, a small group of patients will have anaphylaxis as a "first" reaction.
- Time since envenomation is important. Anaphylaxis rarely develops more than 60 minutes after inoculation.

CARBON MONOXIDE POISONING

Carbon monoxide is an odorless, colorless and tasteless gas that is produced by incomplete combustion of organic materials.

- Any fire may produce large amounts of carbon monoxide
- Other potential sources include:
  - Gas and fuel oil heating systems in homes and buildings
  - Gas-fired hot water heaters
  - Coal, wood, or wood pellet stoves
  - Engine exhaust
  - Charcoal and gas grills
  - Factories with smokestack emissions
  - People participating in water sports can be exposed to CO in boat engine exhaust.

Carbon monoxide binds to hemoglobin with an affinity about 200 times greater than that of oxygen. The resulting carboxyhemoglobin cannot transport oxygen, causing tissue hypoxia that that can lead to permanent neurologic damage or death if untreated.

Measurement of SpO2 is unreliable in the presence of carboxyhemoglobin. Values will be misleading because the light-emitting diode sensor can't distinguish between hemoglobin saturated with CO and hemoglobin saturated with oxygen.

Hemoglobin saturation and blood oxygen content are dangerously low despite adequate (or even elevated) arterial Po2 levels.

General Guidelines:

- The severity of symptoms usually correlates to carboxyhemoglobin levels (see chart below).
- Signs and symptoms of CO exposure include: Headache, dizziness, coma, altered mentation, seizures, visual changes, chest pain, tachycardia, arrhythmias, dyspnea, nausea, vomiting, and flu-like symptoms.
- Other fire byproducts can cause toxicity (e.g. cyanide), and a low reading of COHb cannot reliably rule these toxicities out.
- In smoke inhalation victims, consider cyanide treatment with hydroxocobalamin and sodium thiosulfate as per indications (See 6180 Hydroxocobalamin and Sodium Thiosulfate Protocol)
- 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 treated with CPAP regardless of suspected exposure level and transported.
- The most effective anti-emetic we carry for nausea secondary to CO exposure is Droperidol (see 6120 Droperidol protocol)
- If using the Lifepack 15 to check CO levels and transport is deemed unnecessary, this should be considered a REFUSAL and NOT a “no patient contact.”

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CARBON MONOXIDE POISONING

COHb	Severity	Signs and Symptoms
< 5%	None	No symptoms
10-20%	Mild	Mild Headache, nausea, vomiting, dizziness, blurred vision, dyspnea on exertion
21-40%	Moderate	Severe headache, moderate Confusion, syncope, chest pain, dyspnea, tachycardia, tachypnea, weakness
41-59%	Severe	Severe Dysrhythmias, hypotension, cardiac ischemia, palpitations, respiratory arrest, pulmonary edema, seizures, coma, cardiac arrest
>60%	Fatal	Death

The mainstay of treatment for all suspected carbon monoxide exposures is prompt removal from the source of CO exposure and high flow supplemental oxygen. Current research indicates that CPAP for moderate to severe CO poisoning leads to faster clearance, less neurologic deficits and lower mortality rates.

MILD EXPOSURE					
Management of suspected carbon monoxide poisoning					
15 LPM O2 via NRB	**EMT-IV**	**AEMT**	**EMT I/99**	**P**	**CCP**
	SO	SO	SO	SO	SO

SEVERE EXPOSURE					
Management of suspected carbon monoxide poisoning					
CPAP – if not contraindicated	**EMT-IV**	**AEMT**	**EMT I/99**	**P**	**CCP**
	SO	SO	SO	SO	SO

If CPAP is contraindicated for any reason (altered mentation, hypotension etc), consider CFI.

CYANIDE POISONING

Cyanide toxicity is the result of the inhibition of cytochrome oxidase, which results in the arrest of aerobic respiration, resulting in lactic acid production, acidosis, and ultimately death. Poisoning may occur from inhalation, ingestion, or dermal exposure to various cyanide containing compounds. The most common exposure to cyanide in developed countries occurs from smoke inhalation from closed space fires, as it is released from burning plastics and insulation materials. While carbon monoxide is a well-known toxin in smoke from fires, cyanide can be an overlooked danger.

- Cyanide is often released when everyday items found in most homes and businesses combust (i.e., insulation, foam rubber, wool, plastics and other common synthetic materials). Smoke inhalation is the most common cause of acute cyanide poisoning. Signs and symptoms of carbon monoxide poisoning and cyanide poisoning can be similar, so recognition can be difficult.
- It is important to note that cyanide is also present in car exhaust, some metal polishing compounds, rat poison, and peach/apricot pits. Prolonged exposure to nitroprusside (nitroprusside metabolizes and produces cyanide and methemoglobin) and some nail polish removers (acetonitrile) can result in CN toxicity as well. The gaseous form is much more toxic due to rapid absorption, and the toxic effects from inhalational exposure occur almost immediately.

CYANIDE	COMMON TO BOTH	CARBON MONOXIDE
• Chest Tightness • Altered Mental Status (e.g., confusion, disorientation) • Mydriasis • Tachypnea/Hypernea (early) • Bradypnea/apnea (late) • Hypertension (early)/Hypotension (late) • Cardiovascular collapse • Severely elevated lactate levels	• Headache • Nausea • Vomiting • Confusion • Dyspnea • Coma • Seizure	• Dizziness • Vertigo • Irritability • Flu-like symptoms • Fatigue • Delirium • Ataxia • Loss of consciousness • Chest pain • Myocardial infarction • Stroke • Cardiac arrhythmia

The presence and extent of cyanide poisoning is often initially unknown, and there is no reliable rapid test to confirm toxicity. Treatment decisions must be made on the basis of clinical history and the presenting signs and symptoms.

Significant poisoning is associated with rapidly developing symptoms including headache, nausea, vomiting, anxiety, confusion and collapse. Initial hypertension, tachycardia, and tachypnea progress to hypotension, bradycardia and apnea. Skin may appear pink and SpO2 readings may be inaccurate due to failure of oxygen uptake into the tissues.

In some settings, panic symptoms including tachypnea and vomiting may mimic early cyanide poisoning signs. The presence of altered mental status (e.g. confusion and disorientation) is suggestive of true cyanide toxicity, though it should be noted that these signs can occur with other toxic exposures as well.

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CYANIDE POISONING

In addition to administration of hydroxocobalamin and sodium thiosulfate, cyanide poisoning **MUST BE** treated with immediate attention to supportive care, including airway patency, adequacy of oxygenation and hydration, cardiovascular support, and management of seizures if present.

In the case of suspected significant smoke inhalation, symptoms that warrant treatment with hydroxocobalamin and sodium thiosulfate include:

- Altered mental status (e.g. confusion, disorientation, or coma)
- Hypotension
- Cardiac arrest
- Lactic acidosis, causing tachypnea and a low end-tidal CO2 level

Cyanide toxicity can progress extremely rapidly (within minutes). Therefore, it is imperative to administer the antidote (hydroxocobalamin, followed by sodium thiosulfate) as quickly as possible after the diagnosis is suspected.

Treatment for cyanide toxicity should be comprised of the following:

- 100% FiO2, which may include ventilation with BVM, CPAP, or intubation as indicated.
- Draw blood tubes, including purple top, PRIOR to antidote administration.
- Administer 5 G hydroxocobalamin over 15 minutes, followed by sodium thiosulfate 12.5 G over 10-30 minutes (See 6180 Hydroxocobalamin and Sodium Thiosulfate protocol)
- Treat hypotension with IV fluids and vasopressors if necessary.
- 12 lead ECG, EtCO2, and SpO2 (hydroxocobalamin can make SpO2 and EtCO2 unreliable).
- If QRS is widened, consider sodium bicarb 1-2 meq/kg (see 6410 Sodium Bicarbonate protocol)

(CONTINUED)

CYANIDE POISONING

MANAGEMENT OF SUSPECTED CYANIDE TOXICITY					
Management of A, B, C's **MUST** coincide with antidote administration					
ADULT DOSE: **Hydroxocobalamin** **5 g IV over 15 minutes** **Sodium thiosulfate** **12.5 g IV over 10-30 minutes; slow rate if hypotension develops**	**EMT-IV** --	**AEMT** --	**EMT I/99** SO	**P** SO	**CCP** SO
PEDIATRIC DOSE: **Hydroxocobalamin** **70 mg/kg IV over 15 minutes. Maximum 5 g** **Sodium thiosulfate** **250 mg/kg IV over 10-30 minutes; slow rate if hypotension develops. Maximum 12.5 g**	--	--	SO	SO	SO

Hydroxocobalamin and sodium thiosulfate will be stored in the pyxis system and should be checked out on ALL structure fires. After returning from the call, they should be immediately checked back in.

SPECIAL CONSIDERATIONS:

Depending on the exposure route it may be necessary to decontaminate the patient prior to treatment or transport.

DROWNING

This protocol includes Drowning, Near Drowning, and Submersion

INFORMATION NEEDED

- How long patient was submerged?
- Degree of contamination, water temperature?
- Diving accident? Water depth?

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- Neurologic status: monitor on a continuing basis.
- Signs of trauma
- Lung exam: rales or signs of pulmonary edema, respiratory distress
- Primary survey should include aggressive airway management and restoration of oxygenation and ventilation. Unlike the CAB approach used in standard cardiac arrest, patients suffering cardiac arrest from drowning require and ABC approach with prompt airway management and supplemental breathing

TREATMENT

- Scene safety for rescuers – remove patient from water as soon as possible
  - If there is a delay in getting the patient out of the water initiate basic life support consisting of ventilations only while still in the water
    - Chest compressions are futile while the patient is still in the water
- Stabilize neck and back prior to removing patient from water if any suggestion of trauma
- Clear upper airway of vomitus or large debris.
- Suction as needed
- Administer O2
- Remove wet garments, dry and insulate patient
- If patient not awake and alert:
  - Assist ventilation using BVM with PEEP device
    - Deliver 5 breaths then chest for pulse
  - Start CPR if needed
  - Intubate if indicated and apply PEEP
    - iGel preferred in pediatric patients
    - Strongly consider intubation if pulmonary edema is suspected
  - BGL
  - Establish venous access.
  - Monitor cardiac rhythm during transport; treat arrhythmias per protocol
- If patient awake and alert
  - Monitor ABCs, VS, mental status
  - If respiratory distress develops consider CPAP
    - delayed pulmonary edema may occur after submersion
- Transport patient, even if initial assessment is normal.

SPECIAL PRECAUTIONS

- It may take up to 25 mmHg of PEEP to achieve adequate ventilation – keep increasing PEEP until you hit the max the device will allow or you achieve adequate ventilation
- iGels are not very effective at maintaining PEEP – especially in lungs full of water

(Continued)

DROWNING

- Deep suctioning should be considered if adequate ventilations cannot be achieved
- If you are consistently getting an EtCO2 value of ZERO with a solid line on the wave form – you are not achieving gas exchange – take corrective measures – provided your patient has not been deceased for a long period of time you should be able to obtain some value for EtCO2 if you are ventilating appropriately.
- Beware of neck injuries - they often go unrecognized. Collar and backboard should be applied in the water
- Be prepared for vomiting
- All near-drownings should be transported. Even if patients initially appear fine, they can deteriorate quickly. Pulmonary edema often occurs due to aspiration, hypoxia, and other factors. It may not be evident for several hours after submersion.
- Drowning is frequently accompanied with hypothermia. Even severe bradycardias may be sufficient in the setting of hypothermia and decreased oxygen demand. If patient is hypothermic, defibrillation and pharmacologic therapy may be unsuccessful until the patient is rewarmed. Prolonged CPR may be needed. (See 3070 Hypothermia protocol)
- Good outcomes even after prolonged hypothermic arrest are possible, therefore patients with suspected hypothermia should generally be transported to the hospital and not pronounced in the field.
- Active effort to expel water from the airway (by abdominal thrusts or other means) should be avoided as they delay resuscitative efforts and increase the potential for vomiting and aspiration

HIGH ALTITUDE ILLNESS

INFORMATION NEEDED

- Rate of ascent
- Prior altitude illness
- Rapidity of onset of symptoms
- Past medical history
- Medications

SPECIFIC OBJECTIVE FINDINGS

- Never assume that symptoms at altitude are necessarily due to altitude illness
  - Acute exacerbations of chronic medical conditions at altitude are much more common than actual altitude illness
- Consider non altitude related illness
- High altitude illness symptoms generally fall into three categories:
  - **Acute mountain sickness (AMS)** – headache plus one or more of the following: insomnia, anorexia, nausea/vomiting, fatigue/weakness, dizziness
    - These symptoms must occur in the setting of recent arrival to high altitude (generally considered > 5000-7000 feet)
  - **High-altitude Pulmonary Edema (HAPE)** – progressive dyspnea, cough, hypoxia, headache, fatigue, nausea in high altitude environments (> 8000 feet)
  - **High-altitude Cerebral Edema (HACE) -** ataxia, confusion, headache, neuro deficits, seizure, coma in high altitude environments (> 8000 feet)
    - HACE is rare at the elevations in Colorado; ALWAYS consider alternative causes of altered mental status
- Vital signs
- Mental status: confusion, lack of coordination, coma
- Lungs: respiratory rate, distress, rales, sputum (bloody or frothy)

TREATMENT

- For AMS may remain at current altitude and initiate symptomatic treatments as indicated
- For HACE or HAPE, immediate decent of at least 500-1000 feet is a priority, however rapidity of descent must be balanced by current conditions and other safety considerations
- Put patient at rest, position of comfort
- Administer Oxygen to maintain SpO2 >90%
- Consider CPAP for respiratory distress
  - HAPE Patients are suffering from non-cardiogenic pulmonary edema and may greatly benefit from positive pressure ventilation
- Assist Ventilations as needed
- Establish venous access and initiate fluid bolus to maintain a MAP of 65 mmHg as needed
  - Patients suffering from altitude illness are commonly dehydrated
- Consider antiemetic for nausea
- Monitor vitals during transport

SPECIAL PRECAUTIONS

- Descent is the mainstay of treatment and is the definitive treatment of all altitude related illnesses. Descent should be initiated as soon as scene conditions permit.
- Recognition of the problem is the most critical part of treating high altitude illness. While in the mountains, recognize symptoms which are out of proportion to those being experienced by the rest of the party: fatigue, or trouble breathing (particularly at rest and while lying down).

(Continued)

HIGH ALTITUDE ILLNESS

- 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 feet above sea level, although most people will tolerate up to 8000 feet without difficulty. Altitude illness should not be suspected below 6,500 ft. Treatment is rest at or below current altitude and prescribed medications. This increases the body's time to acclimatize.
- 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
- HAPE and HACE require descent

HYPERTHERMIA

CLASSIFY BY CLINICAL SYNDROME

- Heat Cramps
  - Normal or slightly elevated body temperature
  - Warm, moist skin
  - Generalized weakness
  - Diffuse muscle cramping
    - Legs and abdominal wall are typical
- Heat Exhaustion
  - Elevated body temperature
  - Cool, diaphoretic skin
  - Generalized weakness
  - Anxiety
  - Headache
  - Tachypnea
  - Possible syncope
- Heat Stroke
  - **Altered Mental Status**
  - Very high core body temperature
  - Hot, dry skin
  - Hypotension
  - Seizure
  - Coma

INFORMATION NEEDED

- Patient age, activity level, oral intake
- Medications: depressants, tranquilizers, illicit drugs, alcohol, etc.
- Environmental assessment: temperature and humidity level, exertion level, length of time at risk, clothing
  - Pediatric consideration: Children left in cars who show signs of altered mental status and elevated body temperature should be assumed to have hyperthermia
- Consider non environmental causes (*see special precautions*)

SPECIFIC OBJECTIVE FINDINGS

- Vital signs (including temperature)
- Mental status – if altered check BGL
- Skin signs

TREATMENT

- Remove patient from hot environment and shield from sun or any other external heat source
- Ensure that airway is patent
- Remove as much clothing as is practical and loosen any restrictive garments
- Establish IV and administer 20mL/kg bolus – reassess and repeat as necessary
- Begin active cooling measures id patient altered or temperature > 102.2
  - Cold packs/ice packs to axilla, groin and neck
  - Wet patient – but do not cover them
    - Wet sheets are less effective then evaporative cooling
  - Increase airflow
- If shivering occurs during cooling administer Versed per protocol
- Treat nausea as necessary

(Continued)

HYPERTHERMIA

- Monitor cardiac rhythm
- Monitor vitals during transport

SPECIAL PRECAUTIONS

- Heat stroke is a medical **emergency** - rapid transport is indicated
  - Heat stroke has mortality that exceeds trauma, STEMI, and Stroke and should be treated accordingly
  - Cooling the heat stroke patient as rapidly as possible takes priority over other interventions (cardiac monitoring, IV access etc.)
- People can sweat through heat stroke right up until they die depending on their level of acclimatization.
- The elderly and persons on medications which impair the body's ability to regulate heat are at particular risk for heat stroke.
- Be aware that heat exhaustion can progress to heat stroke.
- Do not let cooling in the field delay your transport. Cool patient as much as possible during transport to the hospital
- There is no evidence supporting obtaining orthostatic vital signs as a clinical indicator
- Other causes of hyperthermia besides environment exposure:
  - 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)
  - Hyperthyroid storm

HYPOTHERMIA / FROSTBITE

CLINICAL SIGNS AND THEIR PRESENTATION WITH WORSENING HYPOTHERMIA

- Mild hypothermia (Core temp 90° to 95° F)
  - Alert patients have a low risk for cardiac arrest secondary to hypothermia
  - These patients have an intact ability to warm themselves
    - Tachypnea
    - Tachycardia
    - Ataxia
    - Dysarthria
    - Impaired judgement
    - Shivering
- Moderate hypothermia (Core temp 90° to 82°)
  - Verbally responsive patients have a moderate risk for cardiac arrest secondary to hypothermia
  - These patient have a limited ability to rewarm themselves
    - Reductions in pulse rate and cardiac output
    - Hypoventilation
    - Decreasing mental status
    - Hyporeflexia
    - Loss of shivering at lower end of core temperature range
    - Paradoxical undressing can occur
    - Cardiac dysrhythmias can occur
    - Pupillary light reflex slows
      - Dilated pupils are seen below core temp of approximately 84°
- Severe Hypothermia
  - Patients responsive only to noxious stimuli or who are unresponsive are at high risk for cardiac arrest
  - These patients have no ability to rewarm themselves
    - Pulmonary edema can occur
    - Hypotension
    - Bradycardia
    - Coma
    - Ventricular arrhythmias
    - Asystole

INFORMATION NEEDED

- Length of exposure
- Air/water temperature
- History and timing of changes in mental status
- Localized injury?
- History of thawing/refreezing?
- Past Medical History
- Medications
- Treatments initiated prior to arrival

CONTINUED

HYPOTHERMIA AND FROSTBITE

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
  - At patient presentation, beware of vital signs inconsistent with the degree of hypothermia. Such inconsistency suggests an alternative diagnosis
- Level of consciousness/mental status
  - Consider other reasons for altered mental status
- A total-body survey should be conducted in all hypothermic patients to exclude local cold-induced injuries in areas not seen during the initial resuscitation and to assess for signs of trauma
- Cardiac rhythm
  - In the field and in the emergency department, misdiagnosis of a non-perfusing rhythm, even with a cardiac monitor, is a hazard. Peripheral pulses can be difficult to palpate in a vasoconstricted bradycardic patient. It is best to check for a carotid pulse for up to a full minute
  - Always assume that some perfusion is occurring when any sign of life is present

TREATMENT

Hypothermia, general:

- Active rewarming of the patient should be done in a very controlled manner and therefore should not be attempted in the field setting. The goal of prehospital care should be to prevent the patient from becoming any colder, stabilize, and transport.
  - Have the patient compartment of the ambulance heated as warm as you can tolerate
  - Remove *all* the patient's clothing whether wet or dry
  - Place patient in Life Blanket according to manufacturer's guidelines
  - Use Bair Hugger device if available
  - DO NOT place hot packs next to skin
  - DO NOT attempt to rewarm the patient with warm IV fluids; warm IV fluids are not warm enough to change patient temperature.
- Vigorous shivering can substantially increase heat production – benzodiazepines are NOT indicated
  - Consider infusion of D-10 to provide caloric replacement during vigorous shivering
- Hypothermic patient have decreased oxygen demands and supplemental oxygen may not be necessary
- Handle hypothermic patients as gently as possible

- **If pulse and respirations present**
  - Keep patient warm/in a warm environment as much as possible
  - ~~o~~ Administer O2; be aware that pulse oximetry is likely to be inaccurate in the cold patient therefor provide O2 based on assessment of patient need. Manage airway and breathing as needed~~.~~
  - Avoid unnecessary rough movement—handle the patient carefully.
  - Remove all clothing from patient. Wrap in Life Blanket and protect from wind exposure.
  - Increase ambient temperature in ambulance.
  - Establish venous access
    - Bolus doses of fluid are preferred to continuous drips
  - Monitor vitals and mental status frequently

(Continued)

HYPOTHERMIA AND FROSTBITE

- **If no pulse or respirations**
  - Keep patient warm/in a warm environment as much as possible
  - CPR
    - Fixed and dilated pupils are not a contraindication to starting CPR. Apparent rigor mortis is not a reliable sign of death. Mandibular rigidity can simulate rigor mortis
    - **Chest compressions should not be performed in patients who manifest an organized rhythm on a cardiac monitor even if they have no palpable pulses and no other signs of life.**
      - Such rhythms may reflect successful perfusion that could be disrupted by chest compressions, any pulseless electrical activity is likely to be transient. There is little downside to withholding CPR briefly in these hypothermic patients. Should pulseless electrical activity become asystole, chest compressions should be started immediately.
  - Administer 1 shock at 360J for ventricular fibrillation
    - It is easier to resuscitate a patient who is not in cardiac arrest than one who requires ongoing circulatory support. Therefore, it is reasonable to attempt defibrillation with a single shock, even in severe hypothermia. Further single attempts can be made with every 5° increase in core temperature.
  - Resume CPR
  - Establish airway
    - Bag at ½ normal rate to prevent hypocarbia which can lower the threshold for ventricular fibrillation
    - Monitor EtCO2
  - Only 1 round of ACLS IV medications until core temperature rises above 30°C (86°F)
  - Administer IV fluids

SPECIAL PRECAUTIONS

- Patients with moderate or severe hypothermia frequently become disproportionately hypotensive during rewarming due to severe dehydration and fluid shift. Two large bore peripheral IV lines should be placed.

Cardiac Arrest

- The heart is most likely to fibrillate below 85-88 degrees F. Prolonged CPR may be necessary until the temperature is above this level.
- ALS drugs are used sparingly as peripheral vasoconstriction may prevent entry into central circulation until temperature is restored. At that time, a large bolus of medications may be infused into the heart.
- Patients who appear dead after prolonged exposure to cold air or water should not be pronounced "dead" until they have been rewarmed. “The patient is not dead until they are warm and dead.” Core temp should be >90°F (32°C) prior to termination of efforts. Full recovery from hypothermia with undetectable vital signs, severe bradycardia, and even periods of cardiac arrest has been reported.
- Bradycardias are normal and should not be treated. Severe bradycardias in moderate to severe hypothermia are common. Delay CPR for 1 min or more to ascertain if there are pulses. The decreased metabolic demand of the severely hypothermic patient make these rhythms tolerable.

(CONTINUED)

HYPOTHERMIA AND FROSTBITE

Frostbite

- Remove wet or constricting clothing. Keep skin dry and protected from wind.
- Do not allow the limb to thaw if there is a chance that limb may refreeze before evacuation is complete, or if patient must walk to transportation.
- Rewarm minor "frostnip" areas by placing in axilla or against a warm object. Avoid hot objects as patient will be unable to sense burning.
- Dress injured areas lightly to protect from pressure, trauma or friction. Do not rub. Do not break blisters.
- Maintain core temperature by keeping patient warm with blankets, heated environment, etc.
- Transport with frostbitten areas supported and elevated if feasible.
- Thawing is extremely painful and should be done under controlled conditions, preferably in the hospital. Careful monitoring, pain medication, prolonged rewarming, and sterile handling are required.
- It is clear that partial rewarming, or rewarming followed by refreezing, is far more injurious to tissues than delay in rewarming or walking on a frozen extremity to reach help. Do not rewarm prematurely. Indications for field rewarming are almost nonexistent.
- Warming with heaters or stoves, rubbing with snow, and other methods of stimulating the circulation are dangerous and should not be used.

PEPPER SPRAY

Tear gas is used for riot control and to disperse crowds. It is composed of chemical irritants such as chloroacetophenone and chlorobenzylidene malononitrile. These agents work by binding to various ion channels found in nociceptors, which are responsible for sensing pain.

Pepper spray is composed of the active ingredients in hot peppers, such as oleoresin capsicum and capsaicin II. These agents target TRPV1, an ion channel in the nociceptors which are responsible for pain sensation.

Tear gas and pepper spray cause skin, eye, respiratory and mucosal irritation.

INFORMATION NEEDED

- Agent used
- History of Asthma
- Traumatic Injuries
- Drug Abuse
- Psychiatric History

SPECIFIC OBJECTIVE FINDINGS

- Respiratory complaint/wheezes
- Lung sounds
- In police custody?

TREATMENT

- The mainstay of tear gas and pepper spray treatment is removal of the contaminating agent and supportive treatment.
- Have patient remove contact lenses if appropriate
- ABCs - Protect and maintain the airway, using oxygen and PPV as needed.
- After ensuring a patent airway, remove any contaminated clothing and anything else that may be irritating the skin, eyes or mouth. Flush eyes with water or saline for 15-20 minutes and skin with water, soapy water or saline.
- Exposed individuals who are persistently symptomatic warrant further evaluation

SPECIFIC PRECAUTIONS

- Some agents are suspended crystals in an oil solution and contact with water will initially reactive the agent.
- Placing an individual who has been exposed to pepper spray or mace has the potential to expose providers to at least minimal effects in the patient compartment – increase ventilation and decontaminate as thoroughly as possible prior to entering the patient compartment.
- The majority of patients will have no lasting long-term effects and irrigation will help with pain. That being said, more severe burns and respiratory distress are possible. Typically, symptoms should begin to subside once the irritant is removed. If patients don't improve or continue to deteriorate once the exposure is eliminated, they should be transported to the hospital for further evaluation.
- Patients exposed to chemical spray with or without history of respiratory disease may develop respiratory complaints up to 20 minutes post exposure, consider a period of on scene observation prior to release.
- Due to the risk of infection milk should not be used to irrigate the eyes.

SNAKE BITES

INFORMATION NEEDED

- Appearance of snake (e.g. rattle, color, banding)
  - **DO NOT handle or attempt to catch a snake, even a dead one. DO NOT handle the severed head of snake as they may reflexively bite. Nor should you spend time and place yourself at risk to look for the snake. DO NOT take dead snake to the hospital.**
  - If the snake is readily available – try to obtain well focused pictures of the head, banding and tail of the snake, as long as that can be done without putting yourself at risk
- Time of bite
- Prior first-aid by patient or friends
- Symptoms: local pain and swelling, peculiar or metallic taste sensations. Severe envenomation may result in hypotension, paralysis, coma, or bleeding

SPECIFIC OBJECTIVE FINDINGS

- Bite wound: location, configuration (1 or 2 fang marks; entire jaw imprint, none)
- Snake identification: look for elliptical pupils, thermal pit and rattle
- Signs of envenomation: spreading numbness and tingling from the site, local edema and pain, ecchymosis, bleeding, hypotension.
- Severe envenomation may result in shock be prepared to treat aggressively if this occurs

TREATMENT

- Remove patient and rescuers from area of snake to avoid further injury
- Remove rings or other bands which may constrict with local swelling
- Immobilize bitten part at heart level
- Minimize venom absorption by keeping bite area still and patient quiet
- Transport promptly for definitive observation and treatment
- **Do not use ice or refrigerants. Do not try and suction venom or remove with incision**
- Establish venous access in an uninjured limb
- Oxygen as needed
- Monitor vital signs
- Provide supportive care and as needed
- Provide pain management as needed per protocol
- Consider treatment of anxiety as indicated
- Alert receiving facility ASAP as CroFab reconstitution is a lengthy processes

SPECIAL PRECAUTIONS

- The only native venomous snakes in SW Colorado is the Western Rattlesnake. **In general, a brief description and the bite mark will identify the type of snake. Do not place yourself, fellow rescuers, or other bystanders in danger by attempting to catch or get a good look at the snake for identification.**
- At least 25% of poisonous snake strikes do not result in envenomation. Conversely, the initial appearance of the bite may not reflect the severity of envenomation.
- Fang marks are characteristic of pit viper bites, such as from the rattlesnake. Jaw prints (without fangs) are more characteristic of nonvenomous species.
- Exotic poisonous snakes, such as those found in zoos or as exotic pets, have different signs and symptoms than those of pit vipers. Get as much information as to type of snake as possible.
- **Again, do not approach or handle the snake, alive or dead.**

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ABDOMINAL TRAUMA

INFORMATION NEEDED

- Location, onset, and mechanism are key elements.
- For penetrating trauma
  - Weapon
  - Projectile
  - Trajectory
- For auto:
  - condition of steering wheel, dash, vehicle
  - speed, patient trajectory
  - seatbelts in use, including lap-belt only
  - airbag deployment
- Past history:
  - Medical problems, including prior abdominal surgeries
  - Medications
  - Drugs or alcohol
- Pregnancy or possibility of pregnancy

SPECIFIC OBJECTIVE FINDINGS

- Observe: distention, bruising, entrance/exit wounds
- Palpate: areas of tenderness, guarding; pelvis stability to lateral and suprapubic compression.

TREATMENT

- Stabilize life-threatening airway and circulatory problems first
- Administer oxygen if indicated
- Spinal immobilization if indicated (rarely indicated in a penetrating trauma)
- Establish venous access
- Observe carefully for signs of blood loss
  - If signs of shock treat per 4070 shock – traumatic protocol
- For penetrating injuries: cover wounds and eviscerations with moist saline gauze to prevent further contamination and drying. Do not attempt to replace or reduce.
- Monitor vital signs during transport.

SPECIAL PRECAUTIONS

- The extent of abdominal injury is difficult to assess in the field. With significant blunt trauma injuries to multiple organs are the rule.
- Patients with spinal cord injury**,** altered sensorium due to drugs or alcohol, head injury or significant distracting injuries (i.e. long bone fractures) may not complain of tenderness and may lack guarding in the face of significant intra-abdominal injury.
- Seatbelts, steering wheels, handlebars and other blunt objects may cause occult intra-abdominal injury that is not apparent until several hours after the trauma. You must consider forces involved to properly assess and treat a trauma victim.
- In children, significant intra-abdominal injury, which may lead to shock, may be present without any external signs of injury, such as abrasions or hematomas.
- The pregnant patient deserves special attention during transport. Transport the patient on her left side or angle backboard to prevent hypotension due to uterine compression of the inferior vena cava.

AMPUTATIONS

INFORMATION NEEDED

- History: time and mechanism of amputation; care for severed part prior to rescuer arrival
- Past history: medications, bleeding disorders, medical problems

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- Other injuries
- Blood loss at scene
- Structural attachments in partial amputations if identifiable

TREATMENT

- General Trauma Care (per 4090 Trauma General Protocol*)*
- Complete amputation or partial amputation with life threatening bleeding
  - Apply tourniquet without delay (See 4040 Extremity Trauma Protocol)
- Control non-life threatening hemorrhage with direct pressure, elevation
  - Apply tourniquet if bleeding not controlled by direct pressure (See 4040 Extremity Trauma Protocol)
- If hypotension or signs of shock treat per 4070 Shock – Traumatic Protocol
- Amputated Part
  - Wrap in sterile gauze, preserving all amputated material.
  - Moisten with sterile saline
  - Place in watertight container (specimen cup, plastic bag, etc) to avoid soaking the severed part
  - Place container in cooler with ice (do not freeze).
- Stump
  - Gently cover stump with sterile dressing
  - Saturate with sterile saline
  - Cover with dry dressing
  - Elevate
- Partial Amputation
  - Cover with moist sterile dressing
  - Splint near amputated part in anatomic position
- Consider pain management if vital signs support
- Treat other injuries per protocol

SPECIAL PRECAUTIONS

- Avoid torsion in handling and splinting.
- Do not use dry ice to preserve severed part.
- The most profuse bleeding may occur in partial amputations, where cut vessel ends cannot retract to stop bleeding. Never clamp bleeding vessels.
- Many factors enter into the decision to attempt re-implantation (age, location, condition of tissues, other options). A decision regarding treatment cannot be made until the patient and part have been examined by a physician and may not be made at the initial destination. Try to help the family and patient understand this, and don't falsely elevate hopes.

BURNS

SCENE MANAGEMENT

- **Assure crew safety**
  - Power off
  - Electrical lines secure
  - Gas off
  - No secondary devices
  - Hazmat determinations made
  - Proper PPE

INFORMATION NEEDED

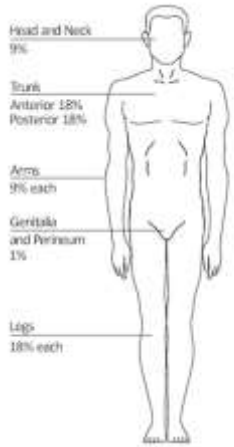
- Circumstances of injury
  - Related trauma in addition to the burns?
  - Inhalation exposures such as Carbon Monoxide (CO) or Cyanide (CN)?
  - Pediatric or elder abuse suspected?
  - Type and degree of burn?
  - Confined space? (assume CO at minimum)
  - Was there electrical contact?
  - Loss of consciousness?
  - Toxic fumes?
- Patient's past history
  - Cardiac or pulmonary disease?
  - Medications?

TYPES OF BURNS:

- Thermal: remove from environment
  - If flames or smoldering are present flood with water
  - Assume CO if enclosed space
  - Consider cyanide poisoning (CN) if unconscious or pulseless arrest
- Chemical: brush off or dilute chemical. Consider HAZMAT
- Electrical: make sure victim is de-energized and suspect internal injuries

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- Calculate total body surface area involved (1st degree burns are not included in TBSA calculations) using "rule of nines" or the "palmar method"



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BURNS

SPECIFIC OBJECTIVE FINDINGS (CONTINUED)

- Is there evidence of CO or CN poisoning or other toxic inhalation?
  - Altered mental status, headache, vomiting, seizure, coma
- Is there evidence of inhalation burns?
  - Respiratory distress, cough, hoarseness, singed nasal or facial hair, soot on face, erythema of mouth, carbonaceous sputum
- Note entrance and exit wounds for electrical burns
- Associated trauma

TREATMENT

INITIAL TREATMENT FOR ALL BURNS:

- STOP the burning process

Thermal burns

- Evaluate the airway and respiratory effort
  - With evidence of inhalation injury
    - Aggressive airway management should be considered
    - Administer 100% O2 during transport
    - Assist ventilations as needed
    - Consider CO or CN
    - Monitor SpO2 and EtCO2
    - Monitor cardiac Rhythm
- High Flow O_2 as indicated
- Remove smoldering or non-adherent clothing
- Remove rings, bracelets, and other constricting items.
- Evaluate degree and percentage of body surface area involved
  - <10% BSA: wet sterile dressings
    - IV TKO
  - >10% BSA: dry sterile dressings
    - Establish 2 large bore IVs and give up to 20 mL/kg fluid bolus – regardless of initial blood pressure or perfusion status
    - Maintain patient warmth for significant burns - increase heat in patient compartment
- Establish IV access in unburned arm if possible
- Consider pain management medications
- Assess for associated trauma from blast or fall.
  - Consider cervical spine precautions

CHEST TRAUMA

INFORMATION NEEDED

- Location of injury. Associated symptoms and complaints of respiratory distress, neck pain,
- other areas of injury
- Mechanism: amount of force involved (particularly deceleration), speed of impact, seatbelt use/type, airbag
- Penetrating trauma: size of object, caliber of bullet, trajectory, distance from patient
- Past medical history: medications, prior medical problems

SPECIFIC OBJECTIVE FINDINGS

- Observe: wounds, sucking or bubbling from open wounds, chest wall movement, neck veins
- Palpate: tenderness, crepitation, tracheal position, tenderness on sternal compression, pulse pressure, subcutaneous emphysema
- Auscultate: breath sounds, heart sounds (quality)
- Surroundings: vehicle, steering wheel condition, dashboard.

TREATMENT

- Immobilize c-spine if indicated (see 1180 Spinal Motion restriction protocol)
- Clear and open airway.
- Manage airway/ventilations as indicated
- Administer O_2 as needed
- If penetrating injury present, transport rapidly with further stabilization during transport
- For open chest wound with air flow noted
  - Use Ascherman chest seal, or occlusive dressing taped on three sides
- Observe chest for paradoxical movements
  - If patient able give them a pillow to "hug" into affected area
  - Consider bulky dressing to stabilize
  - CPAP can be an effective internal splint
- Control hemorrhage with direct pressure and/or QuikClot
- Obtain baseline vital signs, neurologic assessment.
- If patient in shock, transport rapidly and treat per 4070 Shock – Trauma protocol
- Suspected Tension Pneumothorax : (Unilateral absent breath sounds AND at least one of the following: JVD, hypotension, difficulty or inability to ventilate)
  - Release occlusive dressings on open chest wounds if present
  - Consider needle decompression (per 1140 Needle Thoracostomy protocol)
- Suspected Pericardial tamponade, (distant heart sounds, narrow pulse pressure, distended neck veins)
  - Establish venous access - 2 large bore
  - Rapid fluid bolus
- Suspected Cardiac contusion (typical ischemic chest pain or severe chest wall contusion)
  - Monitor cardiac rhythm
  - Establish venous access
  - Treat arrhythmias per protocols
- If patient stable without signs or symptoms of shock:
  - Complete focused assessment
  - Consider pain management
  - If significant injury suspected:
    - Establish venous access
    - Monitor cardiac rhythm en route
- Monitor vital signs and level of consciousness

(CONTINUED)

CHEST TRAUMA

SPECIAL PRECAUTIONS

- Chest trauma is treated with difficulty in the field and prolonged treatment before transport is not indicated if significant injury is suspected. Penetrating injury in particular should receive immediate transport with minimal intervention on scene
- Consider medical causes of respiratory distress such as asthma, pulmonary edema, MI, or COPD when obtaining the patient history. These may have either caused the trauma or been aggravated by it
- Chest injuries sufficient to cause respiratory distress are commonly associated with significant blood loss
- Myocardial contusion can occur, particularly with sudden deceleration injury, as from a steering wheel. Pain is similar to myocardial infarct pain. Monitor the patient and treat arrhythmias as in a medical patient, but think first of hypoxia and hypovolemia as potential causes of arrhythmias
- Check the back for injuries, especially the patient in shock, where a cause is not evident (check the back, axillary region and base of neck)
- Significant intrathoracic injuries can exist without external signs of injury or with minimal signs of injury such as in stab wounds.
- Consider use of CPAP in stabilization of flail chest with severe respiratory distress: this patient must be monitored closely for pneumothorax, have decompression and intubation equipment ready.

EXTREMITY TRAUMA

INFORMATION NEEDED

- Mechanism of injury; direction of forces involved
- Be sure to completely assess patient even if there is a distracting open fracture or the arm or leg.
- Location of pain, range of motion.
- Deformity; numbness
- Previous fractures, injuries or surgery to affected areas
- Other medical history: medications, attempts to treat current injury

SPECIFIC OBJECTIVE FINDINGS

- Position of involved extremity
- Vital signs
- Quality of distal pulses, capillary refill
- Sensation to light touch or sharp object
- Range of motion if able - assess crepitation
- Skin- is there a laceration or open wound? Proximity to joint? Open fracture?
- Blood loss - estimate
- If lower extremities or hip, assess if patient is willing or able to weight-bear- do not force patient.
    - **NOTE: Extremity injuries can be distracting and may draw your attention away from more serious internal injuries or shock. Once hemorrhage is controlled, do thorough patient assessment and treat for shock and bleeding accordingly.**

TREATMENT

- Control major bleeding
- Spinal immobilization if indicated (see 1180 Spinal Motion Restriction protocol)
- Consider pain management PRIOR to splinting if patient is stable
- Splint affected extremity if deformity/partial amputation exists
    - Use gentle but constant axial traction to reduce *significant* angulation if there is a loss of distal pulses
    - Be sure to pad splint appropriately
    - Use appropriate traction splint for suspected isolated mid-shaft femur fractures
    - Remove splint if pain is exacerbated or any loss of distal pulses once applied
- Remove shoes, watches, bracelets or other constricting items if present
- Apply dressings to wounds – recheck distal pulses
- Actively manage patient pain level
- Transport in position of comfort
- Continue assessment of vitals, distal pulses and capillary refill

FACE AND NECK TRAUMA

INFORMATION NEEDED

- Mechanism of injury
  - Impact to steering wheel, windshield, or other objects
  - Clothesline-type injury to face or neck
  - Blunt object to head, face, or neck
  - Penetrating trauma
- Management before arrival by bystanders, first responders
- Patient complaints
  - Shortness of breath
  - Stridor
  - Areas of pain
  - Visual blurring or double vision
  - Difficulty hearing
  - Drainage from ear
  - Neck pain
  - Dental occlusion, tooth loss
- Past medical history: medications, medical illnesses

SPECIFIC OBJECTIVE FINDINGS

- Airway: jaw or tongue instability, loose teeth, vomitus or blood in airway, other evidence of impairment or obstruction
- Neck: tenderness, crepitation, hoarseness, bruising, swelling, stridor
- Blood or drainage from ears, nose
- Level of consciousness, evidence of head trauma
- Injury to eye: lid laceration, conjunctival injection, blood anterior to pupil, abnormal pupil shape, unequal pupil size, abnormal globe position

TREATMENT

- Clear airway
- Rapid trauma assessment
- C-spine immobilization if indicated (high suspicion for all facial trauma) (See 1180 Spinal Motion restriction protocol)
- Assess for need for airway management
  - Suspect laryngeal trauma with:
    - Laryngeal tenderness, swelling, bruising
    - Voice changes
    - Respiratory distress
    - Stridor
  - In suspected laryngeal trauma avoid intubation if patient can be oxygenated by less invasive means
  - Intubate if severe airway bleeding or airway cannot be maintained
- Control hemorrhage
- Administer O_2 as indicated
- Assess neurologic status
- Access for subcutaneous emphysema
- Complete detailed assessment/focused assessment if no life-threatening injuries present.
- Cover injured eyes with protective shield or cup - avoid pressure or direct contact to eye

(Continued)

FACE AND NECK TRAUMA

- Do not attempt to stop drainage from ears, nose
  - Cover lightly with dressing to avoid contamination
- Bring avulsed teeth with you
  - Keep moist in saline-soaked gauze
- IV access during transport
- Treat other injuries per protocol
- Consider pain management as indicated
- Monitor airway closely during transport for development of obstruction or respiratory distress
  - Airway obstruction is the primary cause of death in persons sustaining head and face trauma. Meticulous attention to suctioning and basic airway maneuvers may be the most important treatment rendered
- Monitor ABC's, VS, mentation, SpO_2 and $EtCO_2$

SPECIAL PRECAUTIONS

- Spinal motion restriction is not routinely indicated for penetrating neck injury. Penetrating injury is very rarely associated with an unstable spinal column
- Remember that the apex of the lung extends into the upper chest and may be injured in penetrating injuries of the lower neck, resulting in pneumothorax or hemothorax
- If a penetrating injury creates a complete disruption of the trachea and an opening is visualized, insert endotracheal tube and ventilate
- Fracture of the larynx should be suspected in patients with respiratory distress, abnormal voice, and history of direct blow to neck from steering wheel, rope, fence wire, etc. Intubation may be unsuccessful in the patient with a fractured larynx, and attempts may result in increased injury. The patient needs immediate and rapid transport if you suspect this potentially lethal injury. Do not attempt intubation unless the patient is in severe respiratory distress. Bag-valve-mask ventilation is preferred.
- Do not be concerned with contact lens removal in the field

HEAD TRAUMA

INFORMATION NEEDED

- **History**:
  - Mechanism of injury, estimate of force involved
  - Helmet use
- **History since injury**:
  - Loss of consciousness (duration)
  - Change in level of consciousness
  - Memory loss for events before and after trauma
  - Movement (spontaneous or moved by bystanders)
  - Seizure activity
  - Vomiting
- **Past history**:
  - Blood thinners
  - Other medications (esp. insulin)
  - Medical problems
  - Seizure history
  - Alcohol or drug use

SPECIFIC OBJECTIVE FINDINGS

- Vital signs (note respiratory pattern and rate)
- Neurologic assessment: Glasgow Coma Score

Glasgow Coma Score (GCS) **(Minimum 3, Maximum 15)**	**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	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	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 movement • 2.Extension to painful stimuli • 3.Flexion to painful stimuli • 4.Withdrawal to painful stimuli • 5.Localizes to painful stimuli • 6.Obeys commands	Motor: • 1. No motor response. • 2. Extension to pain. • 3. Flexion to pain. • 4.Withdrawal from pain • 5. Localizes pain. • 6. Obeys Commands.

- External evidence of trauma
- Drainage from nose, ears

TREATMENT

- Assess and provide for spinal motion restriction per protocol
- Assess and manage airway and breathing
  - Intubate if indicated; Intubation is indicated if the patient is unable to protect the airway or has likely poor expected clinical outcome. While there is no absolute GCS that indicates need for intubation, a GCS < 8 warrants aggressive airway management
    - Ventilate at a rate to keep $EtCO_2$ between 35-40 mmHg
- Treat immediate life-threatening conditions

(CONTINUED)

HEAD TRAUMA

- Assess for hypotension and/or signs of shock and treat per 4070 Shock – Traumatic protocol
- Correct hypoxia
- Treat hypotension
- Decrease ICP by elevating head of bed 30 degrees if possible.
- Complete rapid trauma assessment
- Treat other injuries per protocol
  - Control hemorrhage. Stop scalp bleeding with direct pressure. Continued pressure may be needed – QuikClot gauze may be used under pressure dressing
- If patient is combative, consider sedation (See 2030 Agitated Patient Protocol)
  - The airway and C - spine can be more appropriately managed with a relaxed patient
- Transport rapidly if patient has multiple injuries, or unstable neurologic, respiratory, or circulatory status
- An elevated BP along with bradycardia is a common finding in head injury
- Monitor and record airway, vital signs, and level of consciousness repeatedly at scene and during transport. Status changes are important.

SPECIAL PRECAUTIONS

- When head injury patients deteriorate, check first for airway, oxygenation and blood pressure. These are the most common causes of "neurologic" deterioration. If the patient has tachycardia or hypotension, evaluate for hypovolemia from associated injuries.
- Secondary brain injury and adverse outcomes can occur in brain-injured patients who exhibit hypotension and/or hypoxia. Early aggressive treatment of hypotension and administration of high flow oxygen may prevent further injury.
- The most important information you provide for medical control is the level of consciousness and its changes. Is the patient stable, deteriorating or improving?
- Restlessness can be a sign of hypoxia. Cerebral anoxia is the most frequent cause of death in head injury
- Scalp lacerations can cause profuse bleeding, and are difficult to define and control in the field. If direct local pressure is insufficient to control the bleeding, evacuate any large clots from flaps and large lacerations with sterile gauze, and use direct hand pressure over QuikClot Gauze to provide hemostasis. If the underlying skull is unstable, pressure should be applied to the periphery of the laceration over intact bone
- Routine prophylactic hyperventilation should be avoided. It has been shown to be detrimental to cerebral blood flow and patient outcome. Hyperventilation ($EtCO_2$ between 30-35) in the field for head trauma is indicated only when signs of cerebral herniation such as extensor/flexor posturing or asymmetric, nonreactive pupils are present after correcting hypotension and/or hypoxemia.

SHOCK - TRAUMATIC

DESCRIPTION:

- Shock is defined as impaired tissue perfusion and may be manifested by any of the following:
  - Altered mental status
  - Tachycardia
  - Poor skin perfusion
  - Low blood pressure
  - Hypocapnea
- Traditional signs of shock may be absent early in the process, therefore, maintain a high index of suspicion and be vigilant for subtle signs of poor perfusion
  - Increasing level of anxiety is an early indicator of shock
- Do not use Trendelenburg's position routinely to treat hypotension. It is unnecessary and may impair respirations and/or aggravate injuries.
  - Supine position preferred

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- Neurologic assessment: Glasgow Coma Score
- Level of consciousness

TREATMENT

- For trauma patients with hypotension for age or signs of shock
  - Initiate rapid transport
  - Treat and stabilize while en route to hospital whenever possible
- Identify and treat reversible causes of shock
  - Control exsanguinating hemorrhage
  - Treat suspected tension pneumothorax
  - Apply pelvic binder for suspected unstable pelvic fracture
  - Consider TXA early for traumatic life-threatening non-compressible bleeding (including unstable pelvic fractures)
- Complete general trauma care (see *4090 Trauma General*)
- Correct hypoxia and manage the airway as needed
- Keep patient warm
- 2 large bore IV's consider using blood tubing on at least one line
- Titrate fluid boluses to presence of peripheral pulses
  - Hypotension is particularly harmful to patients with severe TBI. In patient with severe TBI, more aggressive fluid resuscitation is justified to maintain a normal blood pressure.
    - Most pediatric trauma mortality is from TBI, therefore fluid resuscitation to normal BP is recommended

Hypotension for Age	
Age	**Systolic Blood pressure**
< 1 year	< 70 mmHg
1-10 years	< 70 + (2 x age in years)
>10 years	< 90 mmHg

Tachycardia for Age	
Age	**Heart rate**
< 1 year	> 160 bpm
1-2 years	> 150 bpm
2-5 years	> 140 bpm
5-12 years	> 120 bpm
> 12 years	> 100 bpm

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

(Continued)

SHOCK - TRAUMATIC

Pediatric Shock
****Hypotension is a late sign in pediatric shock patients ****

Signs of Compensated Shock

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

Signs of Decompensated Shock

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

SPINAL TRAUMA

INFORMATION NEEDED

- Mechanism of injury and forces involved
- Patient ambulatory prior to arrival
- Numbness, tingling, focal weakness
- Past medical problems and medications

SPECIFIC OBJECTIVE FINDINGS

- Neurological assessment
- Vital signs
- Level of sensory and motor deficit; presence of any evidence of neurologic function below level of injury
- Physical exam finding including:
  - Sensory loss, weakness and/or paralysis
    - Typically bilateral, but may be asymmetrical
  - Sensory changes typically have a level, corresponding to the level of the injury
  - Numbness, tingling or painful burning in arms, legs
- Central cord syndrome is an incomplete spinal cord injury and causes painful burning or sensory changed in shoulders and upper extremities bilaterally and spares the lower extremities. It may be subtle

TREATMENT

- Assess airway and breathing; treat life-threatening difficulties
- Administer O2 as needed
- Control life threatening hemorrhage
- Immobilize cervical, thoracic and lumbosacral spine as indicated (See 1180 Spinal Motion Restriction Protocol)
- Neurologic assessment before and after SMR
- Establish IV access (consider 2nd line)
- Obtain vital signs including $EtCO_2$
  - If hypotension and/or signs of shock resuscitate per 4070 Shock Traumatic protocol
- Complete thorough assessment
- Treat other injuries per protocol
- Monitor airway, vitals, and neurologic status frequently at scene and during transport
- Consider pain management as appropriate

SPECIAL PRECAUTIONS

- Be prepared to turn entire SMR device on side if patient vomits
- Neurogenic shock may be present with significant spinal cord injury; if hypotension is unresponsive to simple measures, it may be due to other injuries
- Neurologic deficits make other injuries hard to evaluate. Cord injury above the level of T-8 makes the abdominal examination unreliable.
- SMR in patients with penetrating trauma should be applied only when neurologic deficit is present

TRAUMA - GENERAL

INFORMATION NEEDED

- **Scene evaluation**
  - Note potential hazard to rescuers and patient.
  - Identify number of patients; organize triage operations if appropriate
  - Observe position of patient, surroundings, probable mechanism, and vehicle condition

- **Mechanism of injury**
  - Cause, precipitating factors, weapons used
  - Trajectories and forces involved
  - For vehicular trauma:
    - Specific description of mechanism such as auto vs. pole, rollover, broadside, high speed
    - Condition of vehicle including windshield, steering wheel, compartment intrusion, condition of dashboard/firewall/pedals, type and use of seatbelts**, s**upplemental **r**estraint **s**ystem (e.g. airbag) deployment
  - Helmet use; motorcycle, bicycle, skiing, snowboarding, skateboarding, rollerblading
  - Patient complaints
  - Initial position and level of consciousness of patient
  - Patient movement, treatment since injury
  - Other factors such as drugs, alcohol, medications, diseases, pregnancy

SPECIFIC OBJECTIVE FINDINGS

- Early notification of Trauma Alert to PSMC ED (*see 0670 Trauma Alert protocol*)

TREATMENT

Initial assessment in multiple trauma is performed at the same time as treatment.

- Airway with C-spine immobilization. Use suction, oral or nasal airway initially
- Breathing: apply O2, assist with ventilations as needed
- Circulation - control of major bleeding
- Establish IVs and give fluid bolus if indicated
- If patient is stable, reassess for potentially life-threatening injuries and treat accordingly
- Extremity splinting if indicated
- Consider pain management as appropriate
- Serial vital signs and observations of respiratory, circulatory and neurologic status prior to arrival are critical

USE OF ANTIBIOTICS IN THE TRAUMA PATIENT

- Certain traumatic injuries present a high risk for infection and therefore will benefit from immediate administration of antibiotics.
- While priority of patient care is in the initial stabilization of the patient, the following are indications for field antibiotics, time allowing: multisystem trauma, open wounds that penetrate fascia, open fractures, or contaminated wounds.
- Antibiotic of choice is cefazolin (AKA Ancef). See respective protocol.
- Transport should not be delayed for antibiotic administration in the trauma patient.

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TRAUMA - GENERAL

SPECIAL PRECAUTIONS

- There are patients who cannot tolerate a full assessment before life-saving intervention is needed. Likewise, splinting, bandaging, and, often, the focused history and physical examination are procedures that may need to be bypassed in the critical patient. Time and the treatment available in the ED are critical elements in resuscitation.
  - Critical injuries involve:
    - Difficulty with respiration
    - Difficulty with circulation (hypoperfusion - shock)
    - Decreased level of consciousness

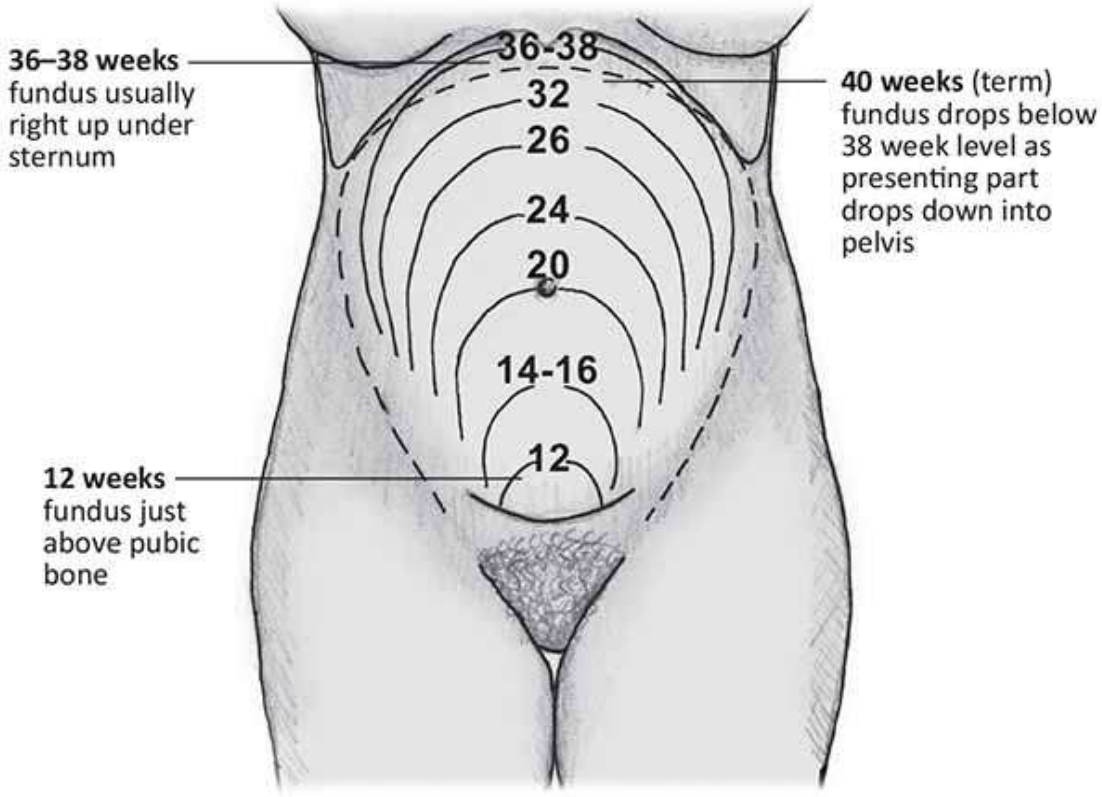
TRAUMA IN PREGNANCY

INFORMATION NEEDED

- Mechanism of injury
- Due date
  - Last menstrual period if due date is unknown
    - Due Date = LMP + 9 months + 7 days
- Patient complaints
  - Urge to push
  - Cramping
  - Fluid leakage
- Complications or concerns with this pregnancy
- Number of previous pregnancies and outcome (Para and Gravida)
- Past medical history
- Medications

SPECIFIC OBJECTIVE FINDINGS

- Thoracic, abdominal or pelvic injury or complaint
  - If present these patients should be **STRONGLY** encouraged to allow transport to the ED for evaluation
- Estimated gestational age by fundal height
  - If uterus is at umbilicus then EGA > 20 weeks
  - If EGA > 20 weeks consider two patients – mother and fetus



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TRAUMA IN PREGNANCY

TREATMENT

- In all pregnancy related trauma the priority is the mother
- 4090 Trauma general protocol
- All pregnant trauma patients with an EGA >20 weeks should be transported, and every effort should be made to convince them to allow transport for evaluation
    - 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
- Unstable pregnant trauma patients regardless of EGA should be transported to PSMC
- Stable pregnant trauma patients call in to PSMC for destination guidance
    - Assure ED doctor is aware of pregnancy and EGA
- Avoid the supine position
    - Place in left lateral recumbent position if possible
    - If SMR in place tilt backboard 15 – 30 degrees to the left
- Pregnancy category of medications should be considered and discussed with patient
- Interpret vital signs with caution – normal vital signs change during pregnancy
    - Increased heart rate
    - Decreased blood pressure
    - Increased blood volume

SPECIAL PRECAUTIONS

- Any pregnant trauma patient who refuses care, evaluation or transport regardless of mechanism of injury or them being asymptomatic should be considered a high risk AMA refusal and documented as such
- Depending on circumstances a pregnant patient who expires in the field may warrant significant resuscitative measures and transport despite lack of ROSC to keep the fetus viable – contact base for direction

TRAUMATIC ARREST

INFORMATION NEEDED

- Time of arrest
- Mechanism: blunt vs. penetrating
- Signs of irreversible death or non-survivable injuries
  - Decapitation
  - Massive burns without signs of life
  - Decomposition
  - Evidence of massive blunt head, chest, abdominal trauma
  - Dependent lividity or rigor mortis

SPECIFIC OBJECTIVE FINDINGS

- Vital signs
- Evidence of significant blood loss
- Evidence of blunt head, thorax or abdominal trauma

TREATMENT

Blunt Trauma Arrest (including isolated GSW to head)

- For non-survivable injuries refer to 080 Field Pronouncement protocol
  - Do not attempt resuscitation if there is evidence of a non-survivable injury and no sign of life
- Consider field pronouncement if there are no signs of life
  - Signs of life include:
    - Spontaneous movement
    - Breathing
    - Presence of a pulse
    - Reactive pupils
- Initiate basic life support, administer O2
- Manage airway and respirations
  - Consider ETT and bilateral chest decompression
- Patients with significant chest trauma who are found to be pulseless at the time of arrival have minimal chance of surviving. Fully assess the patient and check rhythm on the monitor. (See 080 Field Pronouncement of Death protocol)
- Patients with significant chest trauma who experience cardiac arrest during initial evaluation and transport also have minimal chance of surviving unless arrival at the hospital is within 10 minutes.
  - In this case, begin CPR and establish an airway and continue to the hospital. Notify the hospital of the cardiac arrest.
  - If arrival to the hospital is longer than 10 minutes, discuss termination of efforts with medical control.
- If patient is still in cardiac arrest after above treatments, consider field pronouncement
- If pulse returns with above treatment:
  - Start bilateral IVs
  - Administer IV fluids treat per traumatic shock protocol
  - Control any bleeding found on exam

(Continued)

TRAUMATIC ARREST

Penetrating Trauma Arrest

- Consider field pronouncement if there are no signs of life, and the arrest duration is suspected to be > 10 minutes
- Rapid transport
- 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
  - Consider pelvic stabilization
  - Initiate BLS CPR and ventilations at age appropriate rate
- If cardiac activity returns with above treatment, treat arrhythmias per protocols.
- Consider field pronouncement if the following:
  - Signs of irreversible death
  - ALS has been unavailable for at least 20 minutes from the time EMS personnel initiate on-scene assessment and there is no return of vital signs or signs of life
  - No return of pulses despite above measures and patient is more than 10 minutes from arrival to hospital

EXCEPTIONS TO TRAUMATIC ARREST PROTOCOL

- Exceptions to the above recommendations to consider field pronouncement include arrests with the following mechanisms/scenarios:
  - Hypothermic arrest
  - Drowning w/ hypothermia
  - Lightning strike and electrocution
  - Avalanche victim
  - Pregnant patient with estimated gestational age ≥20 weeks

SPECIAL PRECAUTIONS

- Victims of blunt trauma who are still in cardiac arrest after initiation of ACLS have a mortality rate of 100%.
- Trauma arrests secondary to penetrating truncal injuries can be resuscitated and saved. There is a higher rate of survival in victims of low velocity penetrating injuries than victims of high velocity injuries.

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PEDIATRIC Brief Resolved Unexplained Events (BRUE) – (formerly called ALTE)

DEFINITION:

- Suspected BRUE: An event in an infant > 1 year old reported by observer as sudden, brief (usually less than 1 minute), unexplained and completely resolved upon arrival that includes one or more of the following:
  - Breathing changes (absent, decreased, or irregular)
  - Color change (Central cyanosis or pallor)
  - Marked change in muscle tone (hyper- or hypotonia)
  - Altered level of consciousness (increased, irritability, or decreased)

INFORMATION NEEDED

- Clinical history to obtain from observer of event:
  - History of circumstances and symptoms before, during and after the 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?
  - Prior history of BRUE (especially in the last 24 hours)
  - Family history of sudden unexplained death or cardiac arrhythmia in other children or young adults
  - Possible exposure to toxins/drugs
- Past Medical History:
  - Recent trauma
  - Infection (e.g. fever, cough)
  - History of GERD
  - History of Congenital Heart Disease
  - History of Seizures
- Medication

EXCLUSION CRITERIA

- Any signs or symptoms suggestive of underlying or acute illness or injury present upon evaluation
- Identifiable cause of the event, such as:
  - Gastric reflux (spitting up)
  - Swallowing dysfunction
  - Nasal congestion or excessive secretions from the nose and/or mouth
  - Periodic breathing of the newborn
  - Breath-holding spell
  - Change in muscle tone associated with choking, gagging, crying, feeding
  - Seizure (e.g., eye deviation, nystagmus, tonic-clonic activity)
  - Hypoglycemia
  - Significant past medical history
  - Need for IV medication administration
- History or exam concerning for child abuse or neglect
- Color change that involved only redness or isolated hands/feet cyanosis

(Continued)

PEDIATRIC Brief Resolved Unexplained Events (BRUE) – (formerly called ALTE)

SPECIFIC OBJECTIVE FINDINGS

- 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
- Blood glucose level
- Neuro exam for level of consciousness, responsiveness and any focal weakness

TREATMENT

- All patients with a possible BRUE should be placed on continuous cardiac monitoring and pulse oximetry
- Serial observations during transport for change in condition
- Supplemental O_2 for signs of respiratory distress or hypoxemia
- Routine IV placement is not indicated on all suspected BRUE patients
    - IVs should only be placed for clinical concerns of shock or to administer medications
- Regardless of the patient's well appearance, all infants with a history of signs or symptoms suggestive of BRUE should be transported for further evaluation
    - By definition, infants who are not completely well appearing on evaluation do not meet the definition of possible BRUE and should be treated and transported per protocol
- Destination considerations
    - All suspected BRUE patients should be transported at a minimum to PSMC although MRMC may be a better destination – seek guidance from medical control
    - Suspected BRUE patients with any high risk criteria should probably go to MRMC after base contact. High risk criteria include:
        - Less than 2 months of age
        - History of prematurity (less than or equal to 32 weeks gestation)
        - More than one BRUE, now or in the past
        - Event duration longer than 1 minute
        - CPR or resuscitation by caregivers or rescuers

SPECIAL PRECAUTIONS

- BRUE is a group of symptoms not a disease process
- If the infant is not completely well upon arrival, this excludes the possibility of BRUE
    - Treat and transport per applicable protocol
- Avoid using "BRUE", "ALTE", "SIDS" or "near miss SIDS" terminology with parent or guardian
- You play a unique and important role in obtaining accurate history soon after the event and in observing, documenting and reporting environmental, scene and social indicators that may point to an alternate diagnosis
- High risk patients with a possible BRUE have worse outcomes and may require emergency department or inpatient testing, intervention and/or follow up
- The determination of BRUE is made only after hospital evaluation
    - A few of these infants will die even after hospital evaluation and treatment
- All suspected BRUE patients should be transported to the ED
- Contact medical direction if parent/guardian is refusing medical care and/or transport, **especially if any high-risk criteria are present**

INFANT FOUND DOWN / SUDDEN INFANT DEATH SYNDROME (SIDS)

INFORMATION NEEDED

- History: position in which the child was found, condition of the bed, last time the child was seen well, seizure activity, trauma, possibility of ingestion
- Associated symptoms: history of fever, respiratory symptoms, infection, vomiting, diarrhea, other signs of infections
- Past medical history: prematurity, chronic illness

SPECIFIC OBJECTIVE FINDINGS

- ABCs
- Neurologic: level of consciousness, responsiveness, muscle activity and tone
- Skin: signs of trauma
- Check for presence of froth or blood-tinged sputum at mouth or nose. (consistent with SIDS)
- Dependent lividity or early rigor mortis
- Body temperature.

TREATMENT

- Initiate or continue resuscitation
  - ALL SIDS babies should be worked and transported regardless of probability of ROSC
    - Only in the most extreme circumstances e.g., blackening of the face, advanced rigor mortis etc. should scene pronouncement be considered
  - If resuscitative efforts are unlikely to be successful based on clinical judgement patient should receive appropriate BLS care including chest compressions and BVM ventilation
    - Transport should be initiated as a slow and easy emergent return and the hospital notified that resuscitative efforts are in progress and will likely be futile but will continue to the ED for pronouncement there.
      - Try to avoid allowing parents to ride in the ambulance with the infant – utilize PD or family members when possible
- If resuscitation is otherwise warranted
  - Airway: manage as indicated.
  - Breathing: ventilate with 100% oxygen; suction as needed
  - Circulatory: support cardiac output as indicated by:
    - External chest compressions
    - Establish venous access or intraosseous access.
    - Pediatric ACLS as indicated
    - Monitor cardiac rhythm
- Support the parents and siblings.
- Activate appropriate support for the family if the resuscitative efforts are unlikely to be successful. Police, County Social Services, and the SIDS support line should be contacted.

SPECIAL PRECAUTIONS

- SIDS cause is unknown. Cases occur between one month and one year of age. All cases are mandatory coroner cases.
- Consider possible NAT (non-accidental trauma, child abuse) and pass on any concerns to receiving facility personnel. It is best to avoid mentioning this to the family.
- Family members may welcome the following contact information:
  The Colorado SIDS Program, Inc.,
  6825 East Tennessee Avenue, Suite 300, Denver, Colorado 80224
  Local#: 303-320-7771 or toll-free# at 1-888-285-7437
  Website access is http://www.coloradosids.org

PEDIATRICS GENERAL GUIDELINES

Pediatric patients, for the purpose of the protocols, pediatrics are defined as age between 1 month and 12 years, have unique anatomy, physiology, and developmental needs that affect prehospital care as well as hospital care. (For patients below one month of age refer to 2230 Neonatal Resuscitation Protocol. For ages over 12 use adult guidelines.) Because children make up a small percentage of total calls and few pediatric calls involve critically ill or injured patients, it is important to be cognizant of these differences. Therefore, utilize medical control early for guidance when treating pediatric patients with significant findings. Pediatric emergencies are usually not preceded by chronic disease. If recognition of compromise occurs early, and intervention is swift and effective, the child will often be restored to full health.

The following should be kept in mind during the care of children in the prehospital setting:

- Airways are smaller, softer, and easier to obstruct or collapse.
- Respiratory reserves are small. A minor insult like improper position, vomiting, or airway narrowing can result in major deficits in ventilation and oxygenation.
- Unless the child has an abnormality within the cardiovascular anatomy or physiology, children often respond quickly to airway positioning and supplemental oxygen. Airway and respiration is even more of a priority in children since any circulatory compromise often stems from inadequate oxygenation or ventilation.
- Circulatory reserves are also small. The loss of as little as one unit of blood can produce severe shock in an infant. Conversely, children respond to fluid resuscitation. It is much easier to determine the response to fluid resuscitation in children than in adults.
- Assessment of the pediatric patient can be accurately done using your knowledge of the anatomy and physiology specific to infants and children.
- Listen to the parents' assessment of the patient's problem. They often can detect small changes in their child's condition. This is particularly true if the patient has chronic disease.
- The proper equipment is very important when dealing with the pediatric patient. A complete selection of pediatric airway management equipment, IV catheters, cervical collars, and drugs has been mandated by the state. This equipment should be stored separately to minimize confusion.
- Blood pressure readings may be deferred only in the following
  - Children who are fully awake and interactive without any signs of shock.
  - Children without respiratory distress.
  - Children without a history of or any signs of dehydration
  - Children without a history of kidney disease.
- If there is any question at all, obtain a blood pressure
- When following these protocols, the age groups used are:
  - INFANTS: birth to one year
  - TODDLERS: one through five years
  - SCHOOL AGE: six through fourteen years

Normal vital signs in pediatrics

Age	Pulse (Average/minute)	Respirations	Systolic Blood Pressure
Newborn	150	40-60	60-80
6 months	140	25-40	65-105
1 year	135	20-30	70-110
3 years	110	20-30	76-116
5 years	100	20-30	80-120
8 years	90	12-25	86-126
12 years	80	12-25	95-120

PEDIATRIC DEHYDRATION

INFORMATION NEEDED

- History: onset and progression of symptoms, frequency of vomiting and diarrhea, urine output (wet diapers), oral intake, recent trauma, possible drug ingestion
- Past medical history including immunization history.
- Social situation including sick contacts, home environment, travel.

SPECIFIC OBJECTIVE FINDINGS

- General appearance: LOC, muscle tone, color
- ABCs and vital signs
- Skin: warmth of distal extremities, color, skin turgor, capillary fill time (should be less than 2 seconds), pulses
- Mucous membranes moist, presence of tears
- Musculoskeletal: evaluate for trauma
- The signs of dehydration are:
  - EARLY - tachycardia and tachypnea for age, decreased LOC, capillary filling time longer than two seconds, cool skin, mucous membranes dry, sunken eyes and fontanelle;
  - LATE - loss of skin turgor, diminished pulses, and shock

TREATMENT

- Airway: manage as indicated, administer O2
- Breathing: ventilation as indicated
- Circulation:
  - Establish peripheral venous access.
  - Consider fluid bolus of crystalloid fluids: 20cc/kg.
  - Do not delay transport for IV attempts.

SPECIAL PRECAUTIONS

- Assessment of dehydration is primarily by physical exam. Vital signs may be abnormal, but they are nonspecific.
- Monitor carefully for signs of decreased tissue perfusion (shock). Early shock is present if capillary fill time is greater than 2 seconds, and there are poor pulses, muscle tone and color, or decreased mental status. Decompensated shock is present if systolic BP is <normal for age.
- Determination of tachycardia or hypotension is based on age. (See 2270 Shock – Medical protocol*)*

PEDIATRIC RESPIRATORY DISTRESS

INFORMATION NEEDED

- History: sudden or gradual onset of symptoms, cough, fever, wheezing, hoarseness, stridor
- History of potential foreign body aspiration or trauma
- Past medical history
- Current medication use

SPECIFIC OBJECTIVE FINDINGS

- Airway: look for respiratory distress during inspiration, listen for abnormal breathing sounds such as stridor, cough, and wheezing, feel for air movement, crepitation, and tracheal deviation
- Breathing: respiratory rate and effort, chest wall movement/adequacy of tidal volume, color, use of accessory muscles, retractions, nasal flaring, head bobbing, or grunting
- Respiratory sounds by auscultation of chest: wheezing, rales, decreased (unilateral?), prolonged inspiratory or expiratory phases.
- Mental status: AVPU
- General appearance: leaning forward or drooling (suggests upper airway obstruction), skin color and temperature, muscle tone.
- While no case is typical the table below illustrates the usual differences between croup and epiglottitis

Croup VS Epiglottitis		
	CROUP	EPIGLOTITIS
AGE	6 MO to 3 years Peak 1-2 years old	All Ages Classically 1 – 7 years old
ONSET	1-3 Days	Rapid, Hours
EFFECT OF POSITIONING	none	Worse supine Prefer erect chin forward
STRIDOR	Inspiratory and expiratory	Inspiratory
COUGH	Seal like bark	No
VOICE	Hoarse	Muffled
DROOLING	No	Yes

TREATMENT

- Administer high-flow oxygen by blow-by or non-rebreather mask.
- As long as the child is adequately ventilating and has adequate mentation, avoid agitating the patient. Keep the patient in his position of comfort. Use parent to hold child if needed.
- If the child is not ventilating adequately, assist with a BVM.
- In the rare case that the child cannot be ventilated with a BVM device:
  - Reposition airway. Consider oral airway if patient unconscious.
  - If still unable to ventilate, visualize the airway with a laryngoscope. Remove any foreign object with Magill forceps.
  - If nothing is seen, orally intubate the patient.
- Consider intubation ONLY if unable to provide ventilatory support with a BVM and oral airway

PEDIATRIC RESUSCITATION

INFORMATION NEEDED - DO NOT delay rapid intervention to collect information.

- Time since the child was last in good health
- History of any recent illness or injury
- Past medical history

SPECIFIC OBJECTIVE FINDINGS

- General appearance: LOC, interactions, muscle tone, color
- Airway: obstruction, stridor, drooling, cough
- Breathing: respiratory rate, skin color (cyanosis late sign), chest wall symmetry and depth of movement, work of breathing (grunting, nasal flaring, retractions), wheezing
- Circulation: heart rate, peripheral pulses, capillary filling time, skin color, extremity skin temperature
- Level of consciousness, pupil size and reaction to light
- Physical assessment

TREATMENT

- Airway/Breathing:
  - Manage airway. **Effective airway management is by far the most critical aspect of treatment. Bag-mask ventilation using proper technique may be as good if not superior to endotracheal intubation for EMS treatment**.
  - Administer oxygen via blow-by, non-rebreather mask, bag-mask ventilation or via endotracheal tube.
  - If apneic, ventilate with a BVM @ 20/min. Ensure adequate chest rise and fall (tidal volumes)
    - If advanced airway must be used, supraglottic device is preferred in pediatrics
- Circulation:
  - Initiate CPR if indicated.
  - Monitor cardiac rhythm.
  - Establish peripheral venous access.
  - If unable to establish a peripheral IV after 2 attempts or 90 seconds, establish an intraosseous infusion. If unable to see good peripheral vein, go straight to IO infusion.
  - If any signs of poor perfusion, infuse a 20 mL/kg crystalloid fluid bolus. Contact medical control if you feel perfusion is compromised on reassessment.
- Medications:
  - Stabilizing the airway and supporting respiration are the mainstays of treatment
    - Specific treatment should be focused on the etiology of the arrest.
  - Arrhythmias are treated as noted in Arrhythmia Algorithms
    - See medication protocols for pediatric doses.
  - Hypoglycemia is common in younger children. If the child has altered mental status, check the glucose level and administer dextrose IV if indicated.

SPECIAL PRECAUTIONS

- The most successful pediatric resuscitations occur before a full cardiopulmonary arrest. Assess pediatric patients carefully and assist with airway, breathing, and circulatory problems before the arrest occurs, to improve the outcome in pediatric patients.
- Pediatric arrests are most likely to be primary respiratory events. The rescuer's primary attention must be directed to securing the airway and providing good ventilation before specific treatment of cardiac rhythm. Any cardiac rhythm can spontaneously convert to sinus rhythm in a well-ventilated child.

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PEDIATRIC RESUSCITATION

- Cardiopulmonary arrest from trauma is treated with airway management, rapid transport, CPR and fluid administration en route. (See 4110 Traumatic Arrest protocol)
- Recommendations for obstructed airway are abdominal thrusts over the age of one year. Infants less than one year old should be treated with back blows and chest thrusts. Early laryngoscopy should be used in an attempt to visualize and remove upper airway obstructions (1000 Airway Management)
- If a child 1 year or older is in arrest, AEDs can be used.
- Use a length-based emergency tape such as the Broselow tape which is highly accurate and allows for rapid drug and fluid doses along with correct equipment size and use. Its use should be routine for any pediatric emergency.

PEDIATRIC SEIZURES

INFORMATION NEEDED

- History: preceding activity level, onset and duration of seizure, description of seizure activity, fever, color change, recent illness, head trauma, possibility of ingestion, cardiac symptoms.
- Past history: previous seizures, current medications, chronic illness

SPECIFIC OBJECTIVE FINDINGS

- Airway: look for respiratory distress, listen for abnormal breathing sounds, feel for air movement, crepitation, and tracheal deviation.
- Breathing: respiratory rate and effort, chest wall movement (adequacy of tidal volume), use of accessory muscles, retractions
- Circulation: heart rate, pulse, capillary filling time, skin color, blood pressure
- Neurologic: mental status, muscle tone, focal findings, post-ictal period, incontinence. Note improvement or deterioration in mental status with time.
- Note ocular movements and especially if persistent deviation to one side.
- Musculoskeletal: note any associated injuries.

TREATMENT

- Airway: Maintain patent airway by BLS maneuvers. Suction as needed. Administer 100% O2.
- Breathing: Assist ventilation as needed. (rarely necessary)
- If child is in status seizure:
  - Administer Midazolam (Versed) IN.
  - Establish peripheral venous access; IO may be most appropriate access. Administer Lorazepam (Ativan) IV, or Midazolam IV
  - If unable to start peripheral IV: administer Midazolam IM and repeat once if still in status.
  - Determine blood glucose level and draw appropriate blood tubes if possible.
  - If hypoglycemic, give IV dextrose.
- If the child has stopped seizing and is post-ictal, transport while continuing to monitor vital signs and neurologic condition. Establish IV and be prepared to administer Lorazepam or midazolam.
- If child is febrile initiate mild cooling measurers.
- See appropriate medication protocol for dosing.

SPECIAL PRECAUTIONS

- Be ready to protect the child's airway, especially after giving Midazolam. BVM is sufficient in most cases.
- Some seizures occur without tonic or clonic movements. Be sure to observe ocular movements. If there is persistent deviation to one side, treat for status epilepticus.
- Febrile seizures occur in normal children between 6 months and 6 years. Such seizures are usually short, lasting less than 5 minutes, not recurrent, and usually do not require anti-seizure drug therapy.
- Do not force anything between the teeth.
- Consider hypoglycemia as a cause for non-traumatic seizure.
- Breath-holding spells in toddlers can result in seizures.

ACETAMINOPHEN (Tylenol)

DESCRTIPTION

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

PHARMACOLOGY

- Non-opioid analgesic.
- Antipyretic

INDICATIONS

- Relief of pain not significant enough to require fentanyl, as an adjunct to fentanyl administration, or per patient request as an opioid alternative.
- Temperature reduction in fevers over 101°F (38°C)

CONTRAINDICATIONS

- Known hypersensitivity (including skin reactions) or anaphylaxis to acetaminophen.
- Chronic liver disease
- Therapeutic dose of acetaminophen within past 6 hours or greater than 3 gm in last 24 hours.

ADVERSE REACTIONS

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

ADMINISTRATION

- PO tablet to age ≥12 YO for analgesic and antipyretic **OR**
- IV infusion 1000 mg over 15 minutes

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
• 15 mg/kg for adults and pediatrics, max 1000 mg per 6 hours					
○ 325 to 975 mg PO	**SO**	**SO**	**SO**	**SO**	**SO**
○ 1000mg infusion over 15 minutes for pain or fever reduction.	--	**SO**	**SO**	**SO**	**SO**

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ACETAMINOPHEN (Tylenol)

PREGNANCY CLASSIFICATION

- B

SUPPLIED AS

- 325mg tablet
- 1000mg / 100mL glass bottle premix

ADENOSINE (ADENOCARD)

DESCRIPTION:

- Slows tachycardias via modulation of the autonomic nervous system without causing negative inotropic effects – acts directly on sinus pacemaker and vagal nerve terminates to reduce chronotropic and dromotropic activity
- 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)

PHARMACOLOGY

- Adenosine is an endogenous nucleoside with antiarrhythmic activity.
- Adenosine has negative chronotropic actions and prolongs AV conduction by activation of K^+ or inhibition of the slow Ca^+ Channels
- Tachyarrhythmias that are confined to the atria (A-fib, A-Flutter) or ventricles (V-Fib, V-Tach) and do not involve the AV node as part of the reentry circuit are not typically converted by adenosine
- Because of its short plasma half-life (less than 10 seconds with IV doses), the clinical effects of adenosine occur rapidly and are very brief.

INDICATIONS

- Narrow-complex supraventricular tachyarrhythmia after obtaining 12 lead ECG (This may be the only documented copy of the AVNRT rhythm) in stable patients without signs of shock and poor perfusion
- Stable wide complex regular tachycardia of unknown origin
- Will not accelerate ventricular rhythm in patients with WPW

CONTRAINDICATIONS

- Adenosine is not safe in patients with an irregular tachycardia. This may be atrial fibrillation with aberrant conduction and may become worse if the AV node is slowed or blocked.
- Use caution in patients with a history of asthma as it can potentiate bronchospasm

PRECAUTIONS / SIDE EFFECTS

- Transient effects can include heart block, asystole, arrhythmias, flushing, dyspnea, chest pain, or anxiety.
- Use of Digitalis may extend asystole.
- Patients with signs of shock require immediate cardioversion.
- Stable, asymptomatic patients, with history of PSVT, may not need to be treated.
- Patients who take Methylxanthine compounds such as caffeine or theophylline will require higher doses to achieve cardioversion.
- Dipyridamole (persantine) potentiates the effect of adenosine; reduction of adenosine dose may be required
- Carbamazepine may potentiate the AV-nodal blocking effect of adenosine

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ADENOSINE (ADENOCARD)

ADMINISTRATION

- Whenever possible establish the IV at the antecubital or higher.
- Any patient receiving Adenosine must be on a monitor and a 12-lead EKG should be performed and documented. Obtain a continuous EKG strip during drug administration.
- Provider should be looking toward other causes and treatments if the 2nd dose is ineffective.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
• 12 mg dose followed by a 10 cc bolus.	--	--	**VO**	**SO**	**SO**
• Repeat dose of 12 mg may be administered if SVT persist.	--	--	**VO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
• 0.2 mg / kg dose followed by a 5cc fluid bolus. **Maximum 1st dose: 12mg**	--	--	**VO**	**SO**	**SO**
• 0.2 mg / kg for second dose. **Maximum 2nd dose: 12mg**	--	--	**VO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS

- 3mg/ml in a prefilled syringe (12 mg)

ALBUTEROL SULFATE

PHARMACOLOGY

- Albuterol is selective β_2 adrenergic receptor agonist. It is a potent bronchodilator and a positive chrontrope.
- Because of its β agonist properties, it causes K^+ to move across cell membranes inside the cells. This lowers serum K^+ concentration making albuterol an effective temporizing treatment for unstable patients exhibiting signs of hyperkalemia.

INDICATIONS

- For relief of bronchospasm
  - May have benefit in other respiratory illnesses such as bronchitis or any form of reactive airway disease.
- Known or suspected hyperkalemia with ECG changes (i.e.: peaked T waves, QRS widening)
- Crush or suspension injury with suspected hyperkalemia

CONTRAINDICATIONS

- Asthma as a result of myocardial infarction
- Severe tachycardia is a relative contraindication

PRECAUTIONS / SIDE EFFECTS

- Albuterol has sympathomimetic effects. Use with caution in patients with known coronary disease.
  - Monitor pulse, blood pressure, cardiac monitor and 12-lead EKG in patients with a history of heart disease.
- When inhaled, albuterol sulfate can result in paradoxical bronchospasm, which can be life threatening. If this occurs, the preparation should be discontinued immediately.
- While tachycardia is an expected side effect of albuterol administration, if the heart rate rises beyond 150 bpm in adults, discontinue and look for other causes.
- 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.

ADMINISTRATION

- Monitor SpO2 and EtCO2 and document the trending of these values.
  - Document effect of each treatment in terms of air movement and lung sounds as well.
- Monitor blood pressure and heart rate closely and contact medical control if any concerns arise.
- Intubated or CPAP patients may be given albuterol sulfate by attaching the nebulizer in-line.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I	P	CCP
• 2.5 mg in a 3 ml saline premixed solution. Oxygen flow at 6 to 8L	**SO**	**SO**	**SO**	**SO**	**SO**
• For more severe cases and hyperkalemia, administer continuous nebulizer treatment. (7.5 mg in 9 mL)	**SO**	**SO**	**VO**	**SO**	**SO**

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ALBUTEROL SULFATE

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I	P	CCP
• 2.5 mg in 3ml O2 at 6L May dilute in 3ml NS	**SO**	**SO**	**SO**	**SO**	**SO**
• For more severe cases and hyperkalemia, administer continuous nebulizer treatment.	**SO**	**SO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS

- 2.5 mg in 3ml saline.

AMIODARONE (CORDARONE)

PHARMACOLOGY

- Amiodarone has multiple effects showing Vaughn-Williams Class I (Na^+), II (β), III (K^+) and IV (Ca^+) antiarrhythmic actions. It is generally considered a primarily class III anti-arrhythmic agent, but it exhibits characteristics of all 4 classes.
    - Class I: blocks Na^+ channels at rapid pacing frequencies
    - Class II: non-competitive anti-sympathetic action
    - Class III: One of its main effects with prolonged administration is to lengthen the cardiac action potential
    - Class IV: Negative chronotropic effects in nodal tissue
- The dominant effect is prolongation of the action potential duration and the refractory period of myocardial automaticity in the AV node.

INDICATIONS

- Cardiac arrest from Ventricular Tachycardia or Ventricular Fibrillation refractory to defibrillation.
    - Or following successful defibrillation.
- Symptomatic Ventricular Tachycardia or sustained wide complex tachycardia with a pulse (**except** wide complex irregular tachycardia)

CONTRAINDICATIONS

- Second degree and third degree AV Blocks.
- WPW
- Hypersensitivity to Amiodarone (Cordarone).
- Cardiogenic Shock and Pulmonary Congestion.
- **Do not** treat ventricular escape beats or accelerated idioventricular rhythm with amiodarone.

PRECAUTIONS / SIDE EFFECTS

- Use extreme caution in wide complex irregular tachycardia.
- May cause severe hypotension and profound bradycardia.
- Use with caution in sympathomimetic toxidromes (i.e. cocaine or amphetamine overdose)

ADMINISTRATION

- Medical control contact is required to exceed the dosing below.

SPECIAL CONSIDERATIONS

- Amiodarone is preferred over adenosine for treatment of undifferentiated wide complex tachycardia with a pulse.

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AMIODARONE (CORDARONE)

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Pulseless Arrest (refractory VT/VF) • 300 mg IV push. • Administer additional 150 mg bolus in 3-5 min if shock refractory or recurrent VF/VT	--	--	**VO**	**SO**	**SO**
Post successful defibrillation • 360mg in 200mL (premixed solution) infuse over 6 hours at 1 mg/min.	--	--	**VO**	**SO**	**SO**
Wide complex tachycardia (Stable) • 150mg placed in a 100 mL (NS or Dextrose) bag over 10 minutes.	--	--	**VO**	**SO**	**SO**
Refractory unstable wide complex tachycardia • 150 mg placed in a 100 mL bag over 10 minutes.	--	--	**VO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Cardiac Arrest • 5 mg / kg bolus given IV or IO.	--	--	**VO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

- D

SUPPLIED AS

- 150mg/3mL (50mg/mL) vial
- 360mg/200mL Premixed in dextrose

ACETYLSALICYLIC ACID (ASPIRIN / ASA)

PHARMACOLOGY

- ASA inhibits blood clotting. It inhibits the formation of thromboxane A2, a platelet aggregating and vasoconstricting prostaglandin. ASA does this by inhibiting the enzyme cyclo-oxygenase 1 (COX 1) that produces thromboxane A2.
- Platelet aggregation has been implicated in the pathogenesis of atherosclerosis contributing to the acute episodes of TIAs, unstable angina, and acute myocardial infarction.

INDICATIONS

- Suspected Acute coronary syndrome
    - Aspirin is one of the few interventions that has been shown to decrease mortality with a cardiac event and therefore should be considered early in the care of the patient.

CONTRAINDICATIONS

- Active Gastrointestinal bleeding
- Known hypersensitivity or allergy to the drug
- Aspirin should not be given in the last trimester of pregnancy

PRECAUTIONS / SIDE EFFECTS

- Patients taking Coumadin and/or Plavix may receive aspirin.
- Since aspirin is a relatively safe medication, it should be administered to all patients complaining of non-traumatic chest pain unless contraindicated.
- Use in caution with known asthma patients

ADMINISTRATION

ADULT

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
• 324 mg ASA in the form of 4 Children's chewable aspirin. (81 mg each tablet)	**SO**	**SO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION:

- D

SUPPLIED AS:

- Chewable tablets. 81 mg each.

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 and tone
  - Urinary retention
  - Pupillary dilation (mydriasis)
  - Decreased sweat, tear and saliva production (dry skin, dry eyes, dry mouth)

PHARMACOLOGY

- The major action of Atropine is a competitive or surmountable antagonism, which can be overcome by increasing the concentration of acetylcholine at the receptor sites of the effort organ.
  - **Note**: This drug blocks cholinergic (vagal) influences already present. If there is little cholinergic stimulation present, effects will be minimal.
- The drug also prevents or abolishes bradycardia or asystole produced by the injection of choline esters, anticholinesterase agents, or other parasympathetic drugs and cardiac arrest produced by stimulation of the vagus nerve plexus.

INDICATIONS

- Symptomatic bradycardia
- To increase conduction in 2nd and 3rd degree blocks and pacemaker failures.
- As an antidote for organophosphate poisonings that exhibit cholinergic reactions which may present with one or more of the following findings of the acronym:
  - **SLUDGE BBB**
    - Salivation.
    - Lacrimation.
    - Urination.
    - Defecation.
    - GI Motility.
    - Emesis.
    - Bronchorhea
    - Bradycardia
    - Bronchospasm

CONTRAINDICATIONS

- Pyloric stenosis
- Prostatic hypertrophy
- Generally contraindicated in patients with glaucoma

PRECAUTIONS / SIDE EFFECTS

- Bradycardias in the setting of an acute MI are common and may be beneficial. Do not treat them unless there are signs of poor perfusion and/or hypotension. If in doubt, consult medical control.
- Pediatric bradycardias are most commonly secondary to hypoxia. Correct the ventilation first, and only treat the rate directly if that fails. Epinephrine is almost always the first-line drug for bradycardia in pediatric patients.
- Remember that atropine will dilate the pupils and that this is not a sign of anoxic brain injury.

(CONTINUED)

ATROPINE SULFATE

ADMINISTRATION

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Symptomatic Bradycardia • 1 mg IVP ○ Repeat if needed every 3-5 minutes up to a maximum dose of 3 mg (stop at ventricular rate which provides adequate mentation and blood pressure)	--	--	**VO**	**SO**	**SO**
Organophosphate Poisoning • 1 to 2 mg increments to alleviate life threatening symptoms. • No Max Dose	--	--	**VO**	**SO**	**SO**

PEDIATRIC

- Pediatric Bradycardias are primarily caused by hypoxia – correct oxygenation issues first

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Symptomatic Bradycardia • 0.02mg/kg (min dose 0.1mg maximum single dose 0.5 mg) ○ May repeat once after 3-5 minutes	--	--	**VO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

- C

SUPPLIED AS

- 1 mg / 10cc in a 10 cc pre-filled syringe.

CALCIUM GLUCONATE

PHARMACOLOGY

- Moderates nerve and muscle function and facilitates normal cardiac function. It is required for muscle contraction
- Increases myocardial automaticity.
- May reduce cardiac toxicity or failure caused by hyperkalemia.

INDICATIONS

- Calcium channel blocker overdose / toxicity. (Cardizem, Verapamil)
- Life threatening hyperkalemia. (Hypotension with wide QRS)
- Consider in renal failure, dialysis and / or endocrine dysfunction patients.
- Cardiac arrest for any of the following suspected causes: renal failure, dialysis with suspected hyperkalemia, or calcium channel blocker overdose.

CONTRAINDICATIONS

- Ventricular fibrillation.
- Digitalis toxicity.
- Hypercalcemia.

PRECAUTIONS / SIDE EFFECTS

- Magnesium toxicity is no longer a standing order, the doses of magnesium administered in the field are highly unlikely to cause toxicity – if you suspect toxicity make base contact and discuss treatment options with physician
- Base physician contact is strongly recommended to discuss course of treatment.
- Rapid infusion may cause hypotension, bradycardia, or asystole.
- Use with caution for patients taking digitalis. May precipitate digitalis toxicity.
- Assure vessel patency. Infiltration will cause severe pain and tissue necrosis.

ADMINISTRATION

- Flush the IV line between the administration of calcium gluconate and sodium bicarbonate.

(CONTINUED)

CALCIUM GLUCONATE

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	EMT CCP
• **Cardiac arrest:** 3 gram rapid IV bolus. May repeat once in 10 min	--	--	--	**SO**	**SO**
• **Calcium channel blocker overdose:** 3 gram slow IVP over 5 to 10 minutes. May repeat once in 10 min	--	--	--	**SO**	**SO**
• **Hyperkalemia:** 3 gram slow IVP over 5 to 10 minutes. May repeat once in 10 min.	--	--	--	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	EMT P
• **Cardiac arrest:** 60 mg/kg rapid IV bolus. Max 3 g. May repeat once in 10 minutes.	--	--	--	**SO**	**SO**
• **Calcium channel blocker overdose:** 60 mg/kg slow IVP over 5 to 10 minutes. **Max 3 g.** May repeat once in 10 minutes. • If hemodynamically stable, no faster than 100 mg a minute.	--	--	--	**SO**	**SO**
• **Hyperkalemia:** 60 mg/kg slow IVP over 5 to 10 minutes. **Max 3 g.** May repeat once in 10 minutes. • If hemodynamically stable, no faster than 100 mg a minute.	--	--	--	**SO**	**SO**

PREGANANCY CLASSIFICATION

- C

SUPPLIED AS

- 100 mg/ml in a 10 ml Vial. 10% Solution.

CEFAZOLIN (Ancef)

PHARMACOLOGY

Antibiotic, Cephalosporin. Inhibits bacterial cell wall synthesis by binding to one or more of the penicillin-binding proteins (PBPs) which in turn inhibits the final transpeptidation step of peptidoglycan synthesis in bacterial cell walls, thus inhibiting cell wall biosynthesis. Bacteria eventually lyse due to ongoing activity of cell wall autolytic enzymes (autolysins and murein hydrolases) while cell wall assembly is arrested.

INDICATIONS

- Open fractures
- Open wounds that penetrate fascia, large/deep wounds over the joint or contaminated wounds with a suspected transport time of 2 hours or more.

CONTRAINDICATIONS

Hypersensitivity to cefazolin, other cephalosporin antibiotics, **penicillin's**, other beta-lactams, or any component of the formulation.

PRECAUTIONS / SIDE EFFECTS

Monitor patient for anaphylactic reaction.

ADMINISTRATION

2 Gram mixed in **100**mL D5W or NS given over 3–5 minute infusion.

- Use a 10 mL syringe and a blunt time to remove 9.5 mL of NS from a 100 mL bag.
- After the medication is ready for administration, add the reconstituted medication back to the 100 mL bag and attach a 60 drop/mL (Micro drip) to the bag and piggyback the medication into your IV line. Run the antibiotic wide open for a 3-5 minute infusion.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
ADULT: 2 Gram IV over 3-5 minutes	--	**SO**	**SO**	**SO**	**SO**
PEDIATRIC: 50 mg/kg IV over 3-5 minutes, max 2 g	--	**SO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

B

SUPPLIED AS

1 Gram vial requiring reconstitution

DEXTROSE

PHARMACOLOGY

- Glucose is the body's basic source of energy 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 by glucagon, which mobilizes stored glucose into the blood stream.

INDICATIONS

- Hypoglycemia
- The unconscious patient with an unknown history. Any patient with a neurologic deficit or altered state of consciousness, which may be due to hypoglycemia.
- Non-traumatic seizure patients who show no improvement in postictal state.
- Patients in status epilepticus not responsive to benzodiazepines (Ativan or Versed).
- Blood glucose test < 60 if clinically indicated.
- Poisons and Overdoses protocol
- In children with alcohol exposure, suspected sepsis, hypoperfusion or altered mental status.

PRECAUTIONS / SIDE EFFECTS

- In patients with clinical findings suggestive of a CVA, caution should be used when considering dextrose unless the patient has a measurable hypoglycemia.
- Extravasation of glucose can cause tissue necrosis. Ensure IV patency before and during dextrose infusion.
- Even though correction of glucose may be accomplished at the scene, this does not mean that other problems requiring prompt treatment cannot be overlooked. In the elderly patient, hypoglycemia often accompanies other serious illnesses; especially prevalent in sepsis. Many oral medications have a long duration of action and can further decrease serum glucose even after correction with dextrose. Recheck the glucose 30 to 40 minutes after administration of dextrose.
- 100 mL bolus should raise the blood sugar 50-100 mg/dL and, therefore, should be adequate for most patients.
- Effect may be delayed in the elderly patients with poor circulation.
- Do not administer dextrose to a patient who is seizing due to trauma.
- Do not withhold dextrose in a patient suspected of being hypoglycemic

(CONTINUED)

DEXTROSE

ADMINISTRATION

- Draw appropriate blood tubes for blood sugar determination prior to administering dextrose, patient condition allowing.
- Infuse D10 IV solution wide open and titrate to effect (BGL >100 mg/dL and GCS =15)
    - Once mental status has improved infusion should be stopped and patient should be encouraged to eat - ideally carbohydrates and proteins (meat and cheese sandwich, etc.) for longer lasting blood sugar maintenance.
- A 250 mL bag of D10 has exactly the same amount of dextrose as a 50 mL syringe of D50, but is safer to use and offers fewer complications for the patient long term
- D10 does not have to be diluted prior to pediatric or infant administration

ADMINISTRATION (ALL AGES)

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• 2.5 mL/kg D10 infusion IV/IO to a max of 12.5 G (125 mL) may repeat PRN	**SO**	**SO**	**SO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

- C

SUPPLIED AS

- 25 grams in 250 ml (0.1 g/ml).

DIPHENHYDRAMINE (BENADRYL)

PHARMACOLOGY

- Antihistamine for treating histamine-mediated symptoms of allergic reaction
- Useful in the treatment of vertigo. Diphenhydramine diminishes vestibular stimulation and depresses labyrinthine function by means of its central anticholinergic activity.
- Anticholinergic, antiparkinsonian effect, which is used to treat acute dystonic reactions to antipsychotic and antiemetic medications (Droperidol, Haldol, Compazine, etc.)
    - These reactions include oculogyric crisis, acute torticollis, facial grimacing, as well as generalized anxiety with twitching (akesthesias).

INDICATIONS

- Allergic/Anaphylactic reactions
- Vertigo
- To prevent or counteract acute dystonic reactions to anti-psychotic medications such as Haldol.

PRECAUTIONS / SIDE EFFECTS

- Direct CNS effects, which may be stimulant or, more commonly, depressant, depending on individual variation.
    - May have additive depressant effect with alcohol and other CNS depressants.
- MAO inhibitors may prolong and intensify anticholinergic effects of antihistamines.
- Patients over 65 years old are at greater risks of serious side effects including confusion, urinary retention, and dizziness that could lead to fall risk. For these reasons, half dosing is recommended.
- Use w/ caution for patients w/ asthma, glaucoma, cardiovascular disease, and HTN due to atropine like effect.
- Side effects include dry mouth, dilated pupils, flushing, and drowsiness.
- Extrapyramidal reactions may be noted with the administration of Droperidol or Haloperidol (Haldol). Be prepared to administer diphenhydramine to help counteract these side effects. An IM dose of haloperidol may be followed by diphenhydramine via either slow IV or IM administration.

ADMINISTRATION

- The IV route is preferred over the IM route.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
• 50 mg IV/IO/IM (consider ½ dose in patients > 65 YO)	--	**SO**	**SO**	**SO**	**SO**

PEDIATRIC (Children up to 8)

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
• 1 mg/kg slow IV/IO/IM. (Not to exceed 50 mg total)	--	**SO**	**SO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

- B

SUPPLIED AS

- 50 mg/ml in a 1 ml vial

Droperidol - Inapsine

PHARMACOLOGY

- It is thought that Droperidol may bind to postsynaptic gamma-aminobutyric (GABA) receptors.
- Binding of GABA receptors in the chemoreceptor trigger zone may be the mechanism by which Droperidol produces an antiemetic effect
- Droperidol has strong central antidopaminergic action, a mild alpha-adrenergic blockage and weak anticholinergic action; it produces a ganglionic blockade and reduces effective responses.
- Additionally, Droperidol has a strong affinity for histamine receptors which is thought to be responsible for the desired sedative effect

INDICATIONS

- Droperidol is indicated to produce sedation without the loss of consciousness in the treatment of acute psychotic episodes manifested by severe agitation and combativeness.
- As an antiemetic when Zofran is ineffective

CONTRAINDICATIONS

- Droperidol is contraindicated in children
- Prolonged Qt syndrome
- Hypersensitivity to Droperidol

PRECAUTIONS / SIDE EFFECTS

- Be prepared to administer 25-50 mg of diphenhydramine for extrapyramidal reactions
- Can cause hypotension which is usually self-limiting and can be treated effectively with positioning and fluids
- Rare instances of Malignant neuroleptic syndromes
- Adverse reactions are enhanced by rapid administration
- Has been reported to cause Qt prolongation
- Patients receiving Droperidol should be placed on the monitor as soon as safely possible
- QTC post administration must be documented in the narrative section of the PCR - Any value over 500 should be reported to the receiving facility

ONSET

- 3-10 minutes with a duration of 2 to 4 hours

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Nausea/Vomiting refractory to Zofran • 1.25 mg IV/IM may repeat once after 10 minutes	--	--	**VO**	**SO**	**SO**
Agitation/Psychosis □ 5 mg IV/IM may repeat once after 10 minutes	--	--	**VO**	**SO**	**SO**
Violent Agitation □ 10 mg IM may repeat once at 5 mg after 10 minutes from initial dose	--	--	**VO**	**SO**	**SO**

(CONTINUED)

Droperidol - Inapsine

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS

- 5mg/2 mL vial

A BLACK BOX WARNING BY THE FDA CURRENTLY IS IN PLACE FOR THIS MEDICATION DUE TO ITS REPORTED PROARRHYTHMIC EFFECTS

EPINEPHRINE

DESCRIPTION

Endogenous catecholamine α, β-$_1$, and β-$_2$ adrenergic receptor agonist. Causes dose related increase in heart rate, myocardial contractility and oxygen demand, peripheral vasoconstriction and bronchodilation.

PHARMACOLOGY

- Catecholamine with α and β effects
- Epi is a naturally occurring neurotransmitter, the effects of which are mediated by α or β receptors in the target organs
  - α receptors: Vasoconstriction (arterial) - Increases peripheral vascular resistance
  - β-$_1$ receptors: Positive inotropic, chronotropic, and dromotropic effects on the heart.
    - ❖ Subsequent increase in myocardial oxygen consumption, as well as, increased irritability and automaticity
  - β-$_2$ receptors: Potent bronchodilation, vasodilation (venous) and uterine relaxation

INDICATIONS

- Pulseless Cardiac Arrest
- Moderate allergic/anaphylactic reactions
- Acute asthma exacerbation
- Bradycardia with poor perfusion
  - First line medication in Pediatric bradycardia.
- Hypotension with stable rhythm after volume resuscitation
- Beta Blocker or Ca blocker overdose

PRECAUTIONS / SIDE EFFECTS

- Increase in myocardial oxygen consumption can precipitate angina or MI in patients with coronary artery disease.
- Tachycardia and tachydysrhythmias are possible after administration
- May precipitate angina pectoris
- Use with caution in patients with hypertension, hyperthyroidism, peripheral vascular disease, or cerebrovascular disease.
- Asthma is not the only cause of wheezing. Epinephrine is contraindicated in pulmonary edema.
- Anxiety, tremor, palpitations, vomiting, and headache are common side effects.
- Should not be added to sodium bicarbonate or other alkaloids as epinephrine will be inactivated at higher pH.

(Continued)

EPINEPHRINE

ADMINISTRATION

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	CCP
Cardiac Arrest • 1000 mcg 1:10000 IVP	--	--	**VO**	**SO**	**SO**
Persistent Bradycardia / Hypotension • Admin push dose 5-10 mcg IVP q 2-3 min as needed until infusion is ready. ○ 0.5-1 mL of **1/100,000,** mixed as specified below • Establish an Epi drip at 2 - 10 mcg/ min. • Titrate to BP of >90 systolic or MAP >65. Max 40 mcg/min.	-- --	--	**VO** **VO**	**SO** **SO**	**SO** **SO**
Anaphylaxis / Severe asthma in extremis • 300 - 500 mcg (1:1000) IM. Repeat every 5 minutes as needed. • For refractory symptoms, consider an Epi drip at 2 - 10 mcg/ min. • Titrate to BP of >90 systolic or MAP >65. Max 40 mcg/min.	**SO** --	**SO** --	**SO** **SO**	**SO** **SO**	**SO** **SO**

ROSC Pressure Support
• Infusion at 10 mcg/min, titrate to MAP of 80 mmHg.
  • Max 40 mcg/min.
  • May consider infusion of 40 mcg/min prior to ROSC, in rare circumstances where infusion is advantageous over push doses.
	--	--	**VO**	**SO**	**SO**

To Draw up Push Dose (1/100,000)

- Using a saline10mL flush, squirt out 1mL for 9mL NS remaining.
- Draw up 1mL Epi from 1:10,000 amp (needle thru blue stopper) into saline flush.
- This gives you a 1:100,000 concentration (10mcg/mL)

To Mix Infusion

- Add 2000 mcg in 250 NS mL for an 8 mcg/ml concentration.

(Continued)

EPINEPHRINE

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Cardiac Arrest • 10 mcg/kg IVP/IO of 1:10,000 every 3-5min	--	--	**VO**	**SO**	**SO**

Persistent Bradycardia / Hypotension
• **Priority is to optimize ventilation and oxygenation, and give fluids.**
• Admin push dose 1 mcg/kg IVP q 2-3 min as needed until infusion is ready.
  ○ 0.1 mL/kg of **1/100,000,** mixed as specified above
• Establish epi drip 0.1-1 mcg/kg/min
• Titrate to target systolic BP:
  ○ 70 + 2(age in years) mmHg
	--	--	**VO**	**SO**	**SO**

Anaphylaxis / Severe asthma in extremis • 10 mcg/kg (1:1,000) IM (max 300 mcg) • For refractory symptoms, consider an Epi drip at 0.1-0.5 mcg/kg/min • Titrate to target systolic BP: ○ 70 + 2(age in years) mmHg	**SO** --	**SO** --	**SO** **SO**	**SO** **SO**	**SO** **SO**
Stridor at rest • ALTERNATIVE to racemic epinephrine: 5 mL of 1:1,000 epinephrine via nebulizer x 1	--	--	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS

- 1:10,000 - 0.1 mg/ml in 10 ml prefilled syringe **(100 mcg / mL)**
- 1:1,000 - 1 mg / ml in 1 ml vial **(1000 mcg / mL)**

FENTANYL (SUBLIMAZE)

PHARMACOLOGY

- Fentanyl is a powerful synthetic opiate with a mechanism of action similar to morphine. While similar Fentanyl is 100 times more potent than morphine, and less likely to cause histamine release. It is considered to be faster acting and have a shorter duration than morphine. Fentanyl interacts with opiate receptors decreasing pain impulse transmission at the spinal cord level and higher in the CNS. Fentanyl is a powerful μ opiate receptor agonist. It also causes peripheral vasodilation increasing venous capacitance and decreases venous return by depressing the responsiveness of the alpha adrenergic receptors. Since it decreases both preload and afterload, it may decrease myocardial oxygen demand.

- Fentanyl produces the desired effects of analgesia, euphoria and sedation as well as undesired effects of respiratory depression and hypotension

INDICATIONS

- Treatment of hemodynamically stable patients with moderate to severe pain
- Adjunct to induction and maintained sedation (*see 1070 CFI protocol*)

CONTRAINDICATIONS

- Hemodynamic instability
- Respiratory depression or insufficiency (unless using as adjunct in RSI)

PRECAUTIONS / SIDE EFFECTS

- Fentanyl is a sympathetic tone antagonist; be prepared for a lowering of HR, RR, and BP especially in the patient who is in compensated shock.
    - Be prepared for management of respiratory depression
    - Be prepared to administer fluids and/or push dose epinephrine for drops in BP
- Fentanyl should only be given to hemodynamically stable patients and titrated slowly to effect.
- The objective of pain management is not the removal of all pain, but rather, to make the patient's pain tolerable enough to allow for adequate assessment, treatment and transport
- Respiratory depression, including apnea, may occur suddenly and without warning, and is more common in children and the elderly. **Start with ½ traditional dose in the elderly**
- Chest wall rigidity has been reported with rapid administration of fentanyl
- Side effects include: hypotension, bradycardia, drowsiness, nausea, headache, confusion, dizziness

ADMINISTRATION

- After pain control has been achieved through bolus doses, consider fentanyl drip (*see 6160 Fentanyl Infusion*).
- Vital signs should be assessed, especially BP and respirations prior to and during administration
- Any administration that combines together fentanyl and benzodiazepine/dopamine antagonist requires close monitoring including capnography, pulse-oximetry, and cardiac monitor to avoid respiratory depression/aspiration
- May be administered IV, IN, IM, nebulized (shown to be effective in treating pain and dyspnea)

(CONTINUED)

FENTANYL (SUBLIMAZE)

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	CCP

Pain management:
• 1-2 mcg/kg slow IVP/IM
  o Traditional dose:100 mcg
  o Repeat every 10 minutes as needed
• Consider infusion instead of multiple doses
• 50 mcg increments if IN or nebulized
	--	**VO**	**SO**	**SO**	**SO**

- **NOTE**: IV route is preferred for all opioid administration because of more accurate titration and maximal clinical effect. IO/IM/IN for fentanyl are acceptable alternatives when IV access is not readily available. Repeat doses of IN Fentanyl can be given if IV access cannot be established. However greater volumes and repeat IN administration are associated with greater drug run off and may therefore be less effective.

- **Follow *0510 Combining Opioids and Benzodiazepines protocol* when combining analgesics with sedatives.**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	CCP
Pain management: • 1-2mcg/kg all ages	--	**VO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- C (D if used for prolonged periods or at high dosages at term)

FENTANYL INFUSION

PHARMACOLOGY

- Fentanyl is a powerful synthetic opiate with a mechanism of action similar to morphine. While similar Fentanyl is 100 times more potent than morphine, and less likely to cause histamine release. It is considered to be faster acting and have a shorter duration than morphine. Fentanyl interacts with opiate receptors decreasing pain impulse transmission at the spinal cord level and higher in the CNS. Fentanyl is a powerful μ opiate receptor agonist. It also causes peripheral vasodilation increasing venous capacitance and decreases venous return by depressing the responsiveness of the alpha adrenergic receptors. Since it decreases both preload and afterload, it may decrease myocardial oxygen demand.
- Fentanyl produces the desired effects of analgesia, euphoria and sedation as well as undesired effects of respiratory depression and hypotension

INDICATIONS

- Pain control and sedation in intubated patients
- Maintenance of pain control in patients with extreme pain where pain management has already been achieved though bolus dose pain management

CONTRAINDICATIONS

- Hemodynamic instability
- Use caution with head injured patients; exaggerated elevation of ICP may occur
- Respiratory depression or insufficiency (unless using as adjunct in CFI)

PRECAUTIONS / SIDE EFFECTS

- Fentanyl is a sympathetic tone antagonist; be prepared for a lowering of HR, RR, and BP especially in the patient who is in compensated shock.
    - Be prepared for management of respiratory depression
    - Be prepared to administer fluids and/or push dose epinephrine for drops in BP
- Fentanyl should only be given to hemodynamically stable patients and titrated slowly to effect.
- The objective of pain management is not the removal of all pain, but rather, to make the patient's pain tolerable enough to allow for adequate assessment, treatment and transport
- Respiratory depression, including apnea, may occur suddenly and without warning, and is more common in children and the elderly. **Start with ½ traditional dose in the elderly**
- Chest wall rigidity has been reported with rapid administration of fentanyl
- Side effects include: hypotension, bradycardia, drowsiness, nausea, headache, confusion, dizziness

ADMINISTRATION

- Use boluses/loading doses as per 6150 fentanyl protocol to control pain/initiate intubation and then initiate continuous infusion on a pump.
- Put 500 mcg into 50 ml NS for a 10 mcg/1mL concentration. Begin infusion with dosing as noted below, titrate to achieve appropriate pain control.
- IV infusion, using medication infusion pump, provides reliable management of pain/sedation for extended periods of transport
- Consider benzodiazepine bolus if further sedation is required. Monitor with cardiac, Pulse Ox, *and* ETCO2 when combining narcotics and benzodiazepines.

(CONTINUED)

FENTANYL INFUSION

ADULT

PROCEDURE	EMT IV	AEMT	EMT I	EMT P	CCP
• 1-5mcg/kg/hr o Contact medical control for dosing > 5 mcg/kg/hr	--	--	**SO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I	EMT P	CCP
• 0.5-2.0mcg/kg/hr o Contact medical control for dosing > 2.0mcg/kg/hr	--	--	**SO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

- C, this drug is excreted in breast milk.

SUPPLIED AS

- 500 mcg in 5 mL

HALOPERIDOL (HALDOL)

PHARMACOLOGY

- Haloperidol is in the class of antipsychotic medications. Haloperidol produces a dopaminergic blockade, a mild alpha-adrenergic blockade, and causes peripheral vasodilation. Its major actions are sedation and tranquilization. Onset of action is 10 minutes after IM administration with peak effect in 30 minutes. Duration of the sedative effect is 2 - 4 hours but may be prolonged in certain individuals.

INDICATIONS

- Chemical restraint in patients that require transport and are behaving in a manner that poses a threat to their own well-being or others.

CONTRAINDICATIONS

- Do not administer to any patient:
  - With a suspected acute myocardial infarction
  - With a systolic blood pressure under 100 mm Hg, or the absence of a radial pulse
  - Exhibiting signs of sedation, respiratory depression, or CNS depression
  - With known Parkinson's Disease
  - With a known pregnancy
  - With severe liver or cardiac disease
  - Age less than 6 years.
- The action of haloperidol adds to the effect of sedative/tranquilizer type medications and should be used with caution in the presence of these types of medications. In this setting, be prepared for respiratory depression, apnea, muscular rigidity, and hypotension.

PRECAUTIONS / SIDE EFFECTS

- Haldol may cause hypotension, tachycardia, and prolongation of the QT interval, which may in turn cause arrhythmias, namely Torsades de Pointes.
- If initial dose is given IM, place the IV and monitor once the patient is cooperative.
- Due to the vasodilatory effect, haloperidol can cause a transient hypotension that is usually self-limiting and can be treated effectively with position and fluids.
- Should profound hypotension occur that is unresponsive to positioning and fluid therapy and vasopressors are required, epinephrine should not be used since haloperidol may block its vasopressor activity and paradoxically further lower the blood pressure. Some patients may experience unpleasant sensations manifested as restlessness, hyperactivity, or anxiety following haloperidol administration. Extra-pyramidal reactions have been noted hours to days after treatment, usually presenting as spasm of the muscles of the tongue, face, neck, and back. This may be treated with diphenhydramine.(see diphenhydramine protocol)

PRECAUTIONS / SIDE EFFECTS (CONTINUED)

- Rare instances of neuroleptic malignant syndrome (high fever, muscular rigidity, hypo- or hypertension) have been known to occur after the use of haloperidol. The severely dehydrated patient is at greater risk of this complication. If suspected, contact medical control, consider administration of Midazolam and cool the patient.
- Patients that have been given haloperidol should be placed on the monitor as soon as safely possible and their QTc documented in the PCR. The receiving facility should be notified of any QTc greater than 500

(CONTINUED)

HALOPERIDOL (HALDOL)

ADMINISTRATION

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
AGITATION, PSYCHOSIS • Adult Dose: 5 to 10 mg IM. • After 10 minutes, if desired effect has not been achieved, **contact medical control** to consider a second dose.	--	--	**VO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- D – Reports of fetal limb malformation with use during 1st trimester, not for use w/ breast feeding.

SUPPLIED AS

- 5mg/ml in a 1 ml vial **IM injectable only**

HYDROXOCOBALAMIN AND SODIUM THIOSULFATE

PHARMACOLOGY

- Cyanide inhibits cytochrome oxidase, thereby arresting cellular respiration and forcing anaerobic metabolism, which leads to lactate production, acidosis, and ultimately death.
- Hydroxocobalamin is a synthetic congener of Vitamin B 12. This antidote binds cyanide strongly to form cyanocobalamin (Vit. B 12). The cyanocobalamin is then excreted in urine.
- Sodium thiosulfate is a sulfur donor to the cyanide detoxifying enzyme rhodanese.
- These medications act synergistically, as hydroxocobalamin has a faster onset of action, while sodium thiosulfate has a longer onset of action.

INDICATIONS

- Adult or pediatric patient with known or suspected cyanide poisoning from **any route**.
- Most commonly, cyanide poisoning will be from smoke inhalation in an enclosed space, with burning wool, plastics, rubber, or insulation.
- Indicated for use if there is a history of recent smoke exposure AND signs of toxicity.
    - Signs of toxicity include ANY of the following:
        - Altered mental status
        - Hypotension
        - Cardiac arrest

CONTRAINDICATIONS

- None in suspected cyanide poisoning.

PRECAUTIONS / SIDE EFFECTS

- Chromaturia (i.e. red urine), which can last up to 35 days.
- Erythema (skin redness which can last up to 2 weeks).
- Photosensitivity; patient should be advised to avoid direct sunlight while skin is still red.
- Injection site reaction.
- Headache.
- Acneiform rash 7 to 28 days following administration.
- Hypertension (>180/110 mm/Hg) is typically transient and usually lasts less than 4 hours.
- Allergic reaction/anaphylaxis.
- Lab work can be affected.
- Renal function should be monitored for 7 days after administration.

ADMINISTRATION CONSIDERATIONS

- Draw blood tubes prior to administration if possible, as lab work can be affected.
- Give hydroxocobalamin first, followed by sodium thiosulfate. Do not mix.
- These medications should be used in tandem to one another time permitting – if you have started infusing hydroxocobalamin and don't have time to start the Sodium Thiosulfate it should be given to the receiving facility

HYDROXOCOBALAMIN ADULT DOSING: Adult dose is 5 gm IV

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	PCC
• 5 G reconstituted hydroxocobalamin IV over 15 minutes	—	—	SO	SO	SO

(CONTINUED)

Hydroxocobalamin and Sodium Thiosulfate

HYDROXOCOBALAMIN PEDIATRIC DOSING: Pediatric dose is 70 mg/kg up to 5 gm IV

Average Weight by Group	**Grey 4 kg**	**Pink 6.5 kg**	**Red 8.5 kg**	**Purple 10.5 kg**	**Yellow 13 kg**	**White 16.5 kg**	**Blue 21 Kg**	**Orange 26.5 kg**	**Green 33 kg**
Dose	275 mg (11 mL)	450 mg (18 mL)	600 mg (24 mL)	725 mg (29 mL)	900 mg (36 mL)	1150 mg (46 mL)	1475 mg (59 mL)	1850 mg (74 mL)	2300 mg (92 mL)

HYDROXYCOBALAMIN RECONSTITUTION

5 gm vial instructions:
1. The vial consists of a 5 g vial of hydroxocobalamin.
2. Reconstitute: Place the vial in an upright position. Add 200 mL of 0.9% sodium chloride to the vial using the transfer spike. Fill to the line.
3. Mix: Vial should be repeatedly inverted or rocked, not shaken, for 60 seconds prior to infusion.
4. Infuse Vial: Using vented intravenous tubing, hang and infuse desired dose over 15 minutes.
5. Once reconstituted, hydroxocobalamin is stable for 6 hours at room temperature.

HYDROXOCOBALAMIN SUPPLIED AS

- 5 G in 250mL glass vial

SODIUM THIOSULFATE ADULT DOSING: Adult dose is 12.5 gm IV

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	PCC
• 12.5 g sodium thiosulfate IV over 15 minutes	—	—	SO	SO	SO

SODIUM THIOSULFATE PEDIATRIC DOSING: Pediatric dose is 250 mg/kg up to 12.5 gm IV

Average Weight by Group	**Grey 4 kg**	**Pink 6.5 kg**	**Red 8.5 kg**	**Purple 10.5 kg**	**Yellow 13 kg**	**White 16.5 kg**	**Blue 21 Kg**	**Orange 26.5 kg**	**Green 33 kg**
Dose	1000 mg (4 mL)	1625 mg (6.5 mL)	2125 mg (8.5 mL)	2625 mg (10.5 mL)	3250 mg (13 mL)	4125 mg (16.5 mL)	5250 mg (21 mL)	6625 mg (26.5 mL)	8250 mg (33 mL)

SODIUM THIOSULFATE SUPPLIED AS

- 12.5 g in 50 mL

Special Considerations

- Notify receiving facility if hydroxocobalamin and sodium thiosulfate are used.

PREGNANCY CLASSIFICATION

- There are no studies of administration of cyanide antidote to pregnant women. However, severe cyanide poisoning is fatal to mother and fetus. Pregnancy should not be considered a contraindication.

IPRATOPRIUM BROMIDE (ATROVENT)

DESCRIPTION

- Ipratropium bromide is an anticholinergic (parasympatholytic) agent which appears to inhibit vagally mediated reflexes by antagonizing the action of Ach (the transmitter agent released from the vagus nerve). Anticholinergics prevent the increase in intracellular concentration of cyclic guanosine monophosphate (cGMP – 2nd messenger) which are caused by the interaction of Ach with the muscarinic receptor on bronchial smooth muscle. It is also a leukotriene inhibitor and as such mediates the adverse vascular and bronchial effects of systemic anaphylaxis.

PHARMACOLOGY

- Relaxes bronchial smooth muscle and dries respiratory tract secretions.
- Antagonizes bronchoconstriction (it is a broncho-un-constrictor)
- Acetylcholine antagonist. Inhibits vagal influence.

INDICATIONS

- Bronchospasm

CONTRAINDICATIONS

- Patients with a known hypersensitivity to Ipratropium Bromide.

PRECAUTIONS

- To be used in conjunction with albuterol
- Use with caution in patients with coronary artery disease.
- Pulse, blood pressure, and EKG must be monitored.
- Palpitations, dizziness, anxiety, tremors, headache, nervousness, and dry mouth.
- Can cause paradoxical bronchospasm. If this occurs discontinue treatment.

ADMINISTRATION

- ***Should always be mixed with Albuterol – albuterol opens the door, Atrovent is the door stop that keeps it open***

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• 500 mcg mixed with first dose of 2.5mg albuterol via nebulizer	**SO**	**SO**	**SO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• 250 mcg/dose < 20 kg patient weight • 500 mcg/ dose if patient is >20kg • Mixed with initial 2.5mg albuterol at 6L O2.	**SO**	**SO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- B

SUPPLIED AS

- 0.5 mg in 2.5 mL plastic ampule

IV SOLUTIONS

PHARMACOLOGY

- Initiation of all IVs in the field in these protocols utilizes crystalloid fluids. The standard IV drip rate will be TKO unless a fluid bolus or fluid challenge is required.
- Fluids should be administered via infusion pump for all specific rates (e.g. 500mL/hr or weight based doses)

TKO Fluid Rate

INDICATIONS

- Anticipated need for IV
- Drug administration

PRECAUTIONS / SIDE EFFECTS

- Volume overload is a constant danger, particularly in cardiac and renal patients. Keep a close eye on your IV rate during transport.

Fluid Bolus

INDICATIONS

- Hemorrhagic shock, volume depletion, (dehydration, burns, severe vomiting, sepsis)
- Shock caused by increased vascular space (neurogenic shock)

PRECAUTIONS / SIDE EFFECTS

- In hemorrhagic shock, volume expansion with **blood** is the treatment of choice. Crystalloid fluids will temporarily expand intravascular volume and "buy time," but does decrease oxygen-carrying capacity, and is insufficient in severe shock. Because of this, rapid transport is still necessary to treat severely hypovolemic patients who need blood and possibly surgical intervention. Administer the minimum amount of fluids to maintain a MAP of 60mmHg in the hemorrhagic patient.
- Volume overload is a constant danger, particularly in cardiac patients. Keep a close eye on your IV rate during transport. For this reason, a fluid challenge (see below) is more appropriate in cardiac patients.
- Flow rate through a 14g cannula is twice the rate through an 18g cannula, and volume administration in trauma patients can be accomplished more rapidly. If the patient has poor veins, a smaller bore is better than no IV at all.
- IVs in an unstable trauma patient should be placed en route, and may be left to the hospital setting for short transports. Do not delay transport in critical patients for IV attempts. IO should be initiated in patients who present with poor access prospects.

(CONTINUED)

IV SOLUTIONS

ADMINISTRATION

ADULT

PROCEDURE	EMT IV	EMT I/99	EMTP	CCP
TKO Rate • 5 to 10 drops/minute	**SO**	**SO**	**SO**	**SO**
Fluid Bolus • 20ml/kg to a maximum of 1000 mL through large bore cannula, as rapidly as possible. • Repeat X 2 if still hypotensive, then consider a vasopressor.	**SO** --	**SO** --	**SO** **SO**	**SO** **SO**

PEDIATRIC (under 1 year of age)

PROCEDURE	EMT IV	EMT I/99	EMTP	CCP
TKO Rate • 5 to 10 drops/minute	**SO**	**SO**	**SO**	**SO**
Fluid Bolus • 10 ml/kg NS through large bore cannula, as rapidly as possible. • Repeat x 2 if still hypotensive then consider vasopressor.	**SO** --	**SO** --	**SO** **SO**	**SO** **SO**

PREGNANCY CLASSIFICATION

SUPPLIED AS

- 500 mL NS fluid bag
- 250 mL NS fluid bag
- 100 mL NS fluid bag

KETAMINE (KETALAR)

PHARMACOLOGY

Ketamine is a noncompetitive N – methyl D- aspartate (NMDA) receptor agonist that blocks glutamate. Sub anesthetic doses produce analgesia that make it useful in acute and chronic pain management, and pain management in opioid-dependent patients. Onset of action is rapid and dependent upon the route of administration (IV: 30 seconds; IM/IN 10 minutes) duration of action ranges from 10-30 minutes, with total recovery occurring after 1-4 hours. Rapid administration is associated with respiratory depression. Doses higher than analgesic dosing are associated with amnesia and anesthesia. Ketamine is unique among sedative agents in that it provides potent analgesia along with its amnestic sedative effects while maintaining vascular hemodynamics and airway reflexes.

INDICATIONS

- As an analgesic in pain management.
- As an induction agent in the performance of the Chemically Facilitated Intubation procedure.

CONTRAINDICATIONS

- Relative contraindication in penetrating eye trauma.
- As a sedative for the agitated patient
- Age < 3 months

PRECAUTIONS / SIDE EFFECTS

- Patients should be monitored to guard against hypoventilation (ECG, pulse oximetry, and ETCO2).
- Use extreme caution in children <24 months. Some data suggests exposure to Ketamine during critical neurodevelopmental periods (<24 months of age) may negatively affect neurodevelopment.
- Use caution in patients with apnea or hypoventilation, hemodynamically unstable, third trimester pregnancy or schizophrenia
- Laryngospasm is a rare adverse reaction associated with ketamine administration. A BVM with gentle positive pressure is generally sufficient in these rare cases. Have suction available.
- Hypersalivation may be a side effect of ketamine usage. Generally well controlled with suction however, if airway involvement becomes an issue, administer 0.5mg Atropine.
- A feeling of dysphoria may occur in the pain dose. This can generally be avoided by administering ketamine dose over 15 minutes rather than all at once.
- Nystagmus is a common side effect after ketamine administration. Associated nausea and vomiting may occur as well. Consider giving an anti-emetic along with ketamine administration and have suction ready.
- Some patients may experience an “emergence phenomenon” as they come out of ketamine-induced sedation. This problem can be markedly reduced by the use of a small dose of a benzodiazepine (midazolam), as needed when ketamine is used outside of the CFI procedure.
- Patients who have received Ketamine may still have a significant awareness, despite an appearance of unconsciousness. They may be able to hear and have some recall. Patients should be advised that they will experience strange/unusual sensations. Reduce any sensory stimulation surrounding the patient as the effects of Ketamine dissipate.

(CONTINUED)

KETAMINE (KETALAR)

ADMINISTRATION (Pain Relief)

- Research indicates that Ketamine for analgesia works best when used as an adjunct to Fentanyl. If hemodynamically stable, give opiate first due to synergistic effects. Titrate slow IVP at the 0.25 mg/kg dose and repeat if needed. That being said, certain patient populations will benefit from stand-alone use of Ketamine due its ability to maintain vascular hemodynamics and airway reflexes.
  These include, but are not limited to multi- system trauma patients, especially those not tolerating a supine position required for transport, trapped patients with limb injuries, and can be useful in the difficult terrain technical rescue setting where managing pain and anxiety without jeopardizing ventilatory status is indicated.

*** AS OF JULY 2021 KETAMINE IS NO LONGER INDICATED FOR SEDATION OF AGITATED PATIENTS ***

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	CCP
Pain management: • 0.25 – 0.3mg/kg IV repeat q 15- 20min as needed • 0.5mg/kg IM • 0.5-1.5 mg/kg IN • **Max cumulative dose 1 mg/kg/hr** **NOTE:** Time and circumstances permitting, dysphoria associated with Ketamine administration can be minimized by administering doses over 15 min. Consider placing dose in 100mL NS on a micro drip set and run near wide-open. This will run dose in over approx. 10-15 min.	--	--	--	**SO**	**SO**
RSI Induction • 1-2 mg/kg IV RSI maintenance infusion • 2-3 mg/kg/hr via medication pump	--	--	--	**SO**	**SO**

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(Continued)

KETAMINE (KETALAR)

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	CCP
Pain management: • 0.25 mg/kg IV repeat q 20min • 0.5mg/kg IM • 0.5 -1.5 mg/kg IN MAX VOLUME 0.5 mL per naris	--	--	--	**SO**	**SO**

SUPPLIED

- **500**mg/**5**mL vial

PREGNANCY CLASSIFICATION NOTE

- B3: Drugs which have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed.

LIDOCAINE

PHARMACOLOGY

- Anti-dysrhythmic action (Ib) by suppressing automaticity in the His-Purkinje system and by elevating electrical stimulation threshold of the ventricle during diastole.
- Inhibits Na+ ion channels, stabilizing neuronal cell membranes and inhibiting nerve impulse initiation and conduction (amide local anesthetic).

INDICATIONS

- Pain relief with IO infusion.

CONTRAINDICATIONS

- Presence of Bundle Branch Blocks.
- Bradycardias with the presence of AV Blocks.
- Periods of Sinus Arrest.
- Patients with Atrial Fibrillation / Atrial Flutter may experience tachycardia.
- Hypotension. (Systolic less than 80 mm/Hg)

PRECAUTIONS / SIDE EFFECTS

- Can cause:
  - Seizures
  - Drowsiness
  - Tachycardia
  - Bradycardia
  - Confusion
  - Hypotension

ADMINISTRATION Administer 40 mg slow IOP. May repeat in 20 mg increments as needed for local IO site anesthesia to max of 100mg

ADULT

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
IO • 40mg Slow IOP ○ May repeat as needed	--	**SO**	**SO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
IO • 0.5mg/kg not to exceed adult dose ○ May repeat once	--	**SO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- B

SUPPLIED AS

- 20 mg/ml in a 5ml prefilled syringe

LORAZEPAM (ATIVAN)

PHARMACOLOGY

- Lorazepam is a benzodiazepine that potentiates the effects of gamma-aminobutyric acid, an inhibitory neurotransmitter and depresses the CNS at the Limbic and Subcortical levels of the brain. This results in an increase in the motor cortex threshold, reducing incoming electrical and chemical stimulus. It is also depresses or reduces the spread of seizure discharge from its focus by depressing synaptic transport or decreasing nerve conduction.
- It is longer acting than diazepam, and is better absorbed with IM use

INDICATIONS

- Second line treatment of seizures; (versed is treatment of choice for continuing seizure activity)
- Treatment of alcohol or drug withdrawal with high likelihood of impending seizure activity
- Treatment of anxiety or agitation that is compromising the patient's care or putting the caregivers at risk
- Sympathomimetic overdose

CONTRAINDICATIONS

- Patients with a history of hypersensitivity to benzodiazepines
- Narrow angle glaucoma

PRECAUTIONS / SIDE EFFECTS

- Respiratory depression – monitor respiratory quality and the patients' ability to protect their airway. Utilize capnography if the sedative effects are significant
- Hypotension and bradycardia – usually mild and uncommon
- In cases of respiratory distress assure that the respiratory illness has been addressed and is not the cause of the anxiety prior to administration of lorazepam.
- Use caution in patients with hepatic or renal disease since the metabolism and clearance of the drug will be delayed.
- Rate of injection should be slow, not greater than 2 mg/min.
- Use caution with poly-pharmacological overdose due to synergistic effects with alcohol and narcotics
- **Follow Protocol "*0510 Combining Opioids and Benzodiazepines*" when combining analgesics with sedatives.**

(CONTINUED)

LORAZEPAM (ATIVAN)

ADMINISTRATION

ADULT

PROCEDURE	EMT- IV	AEMT	EMT I	EMTP	CCP
Agitation / Sympathomimetic OD • 1-2 mg slow IV or IM • May repeat every 10 minutes as needed	--	--	**SO**	**SO**	**SO**
Anxiety • 0.5-1 mg slow IV or IM • May repeat once after 10 minutes if needed.	--	--	**SO**	**SO**	**SO**
Status Epilepticus • 2-4 mg slow IV or IM • Repeat once after 5 minutes if needed • ***(Midazolam IM/IV preferred)**	--	--	**SO**	**SO**	**SO**
Alcohol withdrawal • 1-2 mg slow IV or IM	--	--	**SO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT-IV	AEMT	EMT I	EMTP	CCP
Agitation / Sympathomimetic OD • 0.02 - 0.05 mg/kg slow IV or IM • May repeat every 10 minutes as needed	--	--	**SO**	**SO**	**SO**
Status Epilepticus • 0.1 mg/kg slow IV or IM • May repeat once after 5 minutes if needed ***(Midazolam IM/IV preferred)**	--	--	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- D – In Humans: An increased risk of congenital malformations associated with the use of minor tranquilizers (chlordiazepoxide, diazepam, and meprobamate) during the first trimester of pregnancy has been suggested in several studies. In animals: reduction of tarsals, tibia, metatarsals, malrotated limbs, gastroschisis, malformed skull, and microphthalmia

SUPPLIED AS

- 2mg vials

MAGNESIUM SULFATE

PHARMACOLOGY

- **Cardiac** - Stabilizes potassium pump, correcting repolarization. Shortens the Q-T interval in the presence of ventricular arrhythmias due to drug toxicity or electrolyte imbalance.
- **Respiratory** - May act as a bronchodilator in acute bronchospasm due to asthma or other bronchospastic diseases. For best results, it should be used after normal field nebulizer therapy has been attempted.
- **Obstetrics** - Controls seizures by blocking neuromuscular transmission. Also lowers blood pressure and decreases cerebral vasospasm.

INDICATIONS

- **Cardiac**
  - Refractory VF and pulseless VT (after amiodarone)
  - Cardiac arrest from suspected torsade de pointes
  - Wide complex tachycardia with pulse in absence of shock and refractory to Amiodarone
- **Respiratory**
  - Acute bronchospasm unresponsive to continuous inhaled beta-agonists, ipratropium, and epinephrine.
- **Obstetrics**
  - Pregnancy > 20 weeks with signs and symptoms of pre-eclampsia or eclampsia, defined as:
    - Blood pressure > 140/90 with altered mental status
    - Seizures = eclampsia
  - Contraindicated if the patient presents with heavy vaginal bleeding.

PRECAUTIONS / SIDE EFFECTS

- AV block
- Decrease in respiratory or cardiac function
- Use with caution in patients taking digitalis
- Monitor deep tendon reflexes (patellar) for early signs of toxicity.
- Later sign of toxicity is respiratory depression. Ventilatory assistance may be needed.
- Base contact is required if magnesium toxicity is suspected before administration of Calcium Gluconate.
- Not for pediatric use

ADMINISTRATION

- May be initiated only as an IV bolus
- Continuous infusion only for interfacility transport.

(CONTINUED)

MAGNESIUM SULFATE

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Cardiac Arrest (Refractory VF and Pulseless VT or Torsades) • 2.0 grams IVP.	--	--	--	**SO**	**SO**
Wide Complex Tachycardia with pulse and without poor perfusion refractory to Amiodarone • 2.0 grams IV over 2 minutes	--	--	--	**SO**	**SO**
Respiratory (Acute Bronchospasm) • 2.0 grams slow IVP over 2 minutes	--	--	--	**SO**	**SO**
Pre-eclampsia patients • 2-4 grams IVP over 2 minutes	--	--	--	**SO**	**SO**
Eclampsia patients • 4 grams slow IVP over 2 minutes	--	--	--	**SO**	**SO**

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS

- 0.5 g/ml in 10 ml prefilled syringe

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 exacerbation
- Adrenal Insufficiency

CONTRAINDICATIONS

- Hypersensitivity to this drug
- Evidence of Active GI Bleed

PRECAUTIONS / SIDE EFFECTS

- Must be reconstituted and used promptly
- Be aware that the effect of methylprednisolone is generally delayed for several hours. Although it is worthwhile to administer methylprednisolone early in the treatment of a patient with severe respiratory distress or anaphylaxis you may not see any effect from the drug for several hours. Do not expect to see any immediate response.
- 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 should be administered. Do not delay transport to administer this drug.

ADMINISTRATION

- Drug is supplied in a dual chambered vial. To mix the chambers, push the ends together and slowly tip vial back and forth to mix.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
Anaphylaxis, Severe Asthma, COPD, Adrenal insufficiency • 125 mg IV	--	--	**SO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I	EMTP	CCP
Anaphylaxis, Severe Asthma • 2 mg/kg IV	--	--	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION:

- C

SUPPLIED AS:

- 125 mg dry drug, final 2 ml solution

MIDAZOLAM (VERSED)

PHARMACOLOGY

- Midazolam HCl is a water-soluble short acting benzodiazepine sedative-hypnotic.
- Midazolam HCl binds to stereospecific receptors on the postsynaptic GABA neuron at several sites within the CNS.
  - The neutral amino acid GABA is the major inhibitory neurotransmitter in the CNS
- Benzodiazepines stabilize the cellular membrane by altering cation transport
  - This results in an increase in the motor cortex threshold, reducing its response to incoming electrical or chemical stimulus
  - It also depresses or reduces the spread of seizure discharge from its focus by depressing synaptic transport or decreasing nerve transmission.

INDICATIONS

- First line treatment in status epilepticus
- CFI (see ***1070 CFI protocol***) and post-intubation sedation.
- Sedation of the agitated patient (See ***2030 Agitated Patient Protocol***)
- Sedation prior to cardioversion or pacing.

CONTRAINDICATIONS

- Hypotension

PRECAUTIONS / SIDE EFFECTS

- **Can cause significant respiratory depression, apnea, and hypotension** especially when used in combination with other sedatives such as alcohol or narcotics. **Continuous pulse oximetry, ETCO2, and cardiac monitoring should be applied and are mandatory when combining with pain medications**.
- Emergency resuscitative equipment and medications should be immediately available.
- Consider lower doses for elderly patients; significant respiratory depression, apnea, and hypotension are more frequently encountered.

ADMINISTRATION

- Appropriate for IV, IM, IN, IO, and Rectal routes.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I	P	CCP
Status seizures • 5 - 10mg IV/IM/IN	–	**SO** ***Intranasal ONLY**	**SO**	**SO**	**SO**
• Establish IV access and repeat if necessary after 5 minutes	–	--	**SO**	**SO**	**SO**
Agitated patient • 5-10mg IV/IM (*See **2030 Agitated Patient Protocol***)	–	--	**SO**	**SO**	**SO**
Synchronized cardioversion sedation: • 2mg IV/IM/IN (IV preferred)	–	--	**SO**	**SO**	**SO**

(CONTINUED)

MIDAZOLAM (VERSED)

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I	P	CCP
Status Epilepticus • 0.2 mg/kg IV/IM/IN. ○ IM route preferred if no initial IV access.	--	**SO** ***Intranasal ONLY**	**SO**	**SO**	**SO**
• Establish IV access and repeat if necessary after 5 minutes: 0.2 mg/kg IV (maximum dose 10 mg). ***If still seizing after 2 doses, contact medical control.**	--	--	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- D

SUPPLIED AS

- 5 mg/ml in a 2 ml vial (10mg/2mL)

MIDAZOLAM (VERSED) INFUSION

PHARMACOLOGY

- Midazolam HCl is a water-soluble short acting benzodiazepine sedative-hypnotic.
- Midazolam HCl binds to stereospecific receptors on the postsynaptic GABA neuron at several sites within the CNS.
    - The neutral amino acid GABA is the major inhibitory neurotransmitter in the CNS
- Benzodiazepines stabilize the cellular membrane by altering cation transport
    - This results in an increase in the motor cortex threshold, reducing its response to incoming electrical or chemical stimulus
    - It also depresses or reduces the spread of seizure discharge from its focus by depressing synaptic transport or decreasing nerve transmission.

INDICATIONS

- Post intubation sedation: to be used as an adjunct to analgesic drip when patient comfort is not achieved solely through analgesia.

CONTRAINDICATIONS

- Hypotension
- Patients with a history of hypersensitivity to benzodiazepines
- Narrow angle glaucoma

PRECAUTIONS / SIDE EFFECTS

- **Can cause significant respiratory depression, apnea, and hypotension** especially when used in combination with other sedatives such as alcohol or narcotics. **Continuous pulse oximetry, capnography and cardiac monitoring as well as BP's q 5 minutes are mandatory.** Ensure ventilator is set to administer proper tidal and minute volumes
- If hypotension occurs, attempt to correct with fluids or vasopressors
- Proper sedation is a gold standard of post intubation care
- **Follow *0510 Combining Opioids and Benzodiazepines* protocol when combining analgesics with sedatives.**

ADMINISTRATION

- Via infusion pump only. Place 50 mg in 100 mL NS for a concentration of 0.5mg/ml.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Post Intubation Sedation • 0.025 to 0.2 mg/kg/hr	--	--	--	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
Post Intubation Sedation • 0.025-0.1mg /kg/hr is the typical dose o Consult with medical control	--	--	--	**VO**	**VO**

PREGNANCY CLASSIFICATION

- D

SUPPLIED AS

- 10 mg/ml in a 2 ml vial

NARCAN (NALOXONE)

PHARMACOLOGY

- Naloxone is a competitive opioid receptor antagonist.
- It prevents or reverses the effects of opioids, including respiratory depression, sedation and hypotension, by direct competition with the μ (mu), κ (Kappa), and σ (Sigma) opioid receptor sites. It has no agonist properties of its own, and in the absence of opioids, naloxone exhibits little significant pharmacological activity

INDICATIONS

- For reversal of suspected opioid induces CNS and respiratory depression
- May be effective in Clonidine overdoses.
- Seizure/Coma of unknown etiology, to rule out narcotic overdose (particularly propoxyphene)

PRECAUTIONS / SIDE EFFECTS

- In patients physically dependent on narcotics, frank and occasionally violent withdrawal symptoms may be precipitated. Be prepared to restrain the patient.
- May need large doses (8-12 mg) to reverse propoxyphene (Darvon/Darvocet) or Carfentanyl overdose.
- The duration of some narcotics is *significantly* longer than naloxone and the patient **must** be monitored closely. Repeated doses of naloxone may be required. Patients who have received this drug **SHOULD** be transported to the hospital because coma may reoccur when naloxone wears off.
- With an endotracheal tube in place and assisted ventilation, narcotic overdose patients may be safely managed without naloxone.
- Administration of Narcan can precipitate flash pulmonary edema.

ADMINISTRATION

- Titrate the dose (0.25-0.5 mg at a time) to reverse circulatory and respiratory depression, but to keep the patient groggy
- In cases of severe respiratory compromise or arrest, 2 mg bolus IV/IO/IM is appropriate, otherwise drug should be titrated.
- With some newer synthetic opioid formulations, higher doses of naloxone may be required. In rare cases of confirmed or strongly suspected opioid overdose with insufficient response to 2mg, higher doses may be used, titrate to effect.
- Double dose for IN route.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• 0.25 - 0.5 mg IVP q 2-3 min or 1 mg IN, q 2-3min. ○ Titrate to adequate breathing up to 4mg (8mg IN) total dose or desired effect. • May give 2 mg IVP/IN if patient in extremis.	**SO**	**SO**	**SO**	**SO**	**SO**

(CONTINUED)

NARCAN (NALOXONE)

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• 0.25-0.5 mg IV/IO/IM/IN ○ Titrate to effect • May give 2 mg IVP/IN if patient in extremis.	**SO**	**SO**	**SO**	**SO**	**SO**

SPECIAL CONSIDERATIONS

- Not intended for use unless respiratory depression or impaired airway reflexes are present. Reversal of suspected mild-moderate opioid toxicity is not indicated in the field as it may greatly complicate treatment and transport as narcotic-dependent patients may experience violent withdrawal symptoms
- Patients receiving EMS administered naloxone **should** be transported to a hospital.
- In the State of Colorado, bystanders, law enforcement, and other first responders can administer naloxone if they feel a person is experiencing an opiate-related drug overdose event (Colorado Revised Statutes §12-36-117.7).
- There are significant concomitant inherent risks in patients who have received naloxone, including:
  - Recurrent respiratory/CNS depression given short half-life of naloxone.
  - Co-existing intoxication from alcohol or other recreational or prescription drugs.
  - Acetaminophen toxicity from combination opioid/acetaminophen prescriptions.
  - Non-cardiogenic pulmonary edema associated with naloxone use.
  - Acute psychiatric decompensation, overdose, SI/HI or psychosis requiring ED evaluation.
  - Sudden abrupt violent withdrawal symptoms which may limit decision making capacity.
- Given the above risks, it is strongly preferred that patients who have received naloxone be transported and evaluated by a physician. However, if the patient clearly has ***decision-making capacity*** he/she does have the right to refuse transport. If adamantly refusing, patients must be warned of the multiple risks of refusing transport.
- If the patient is refusing transport contact base. If any concerns or doubts about ***decision-making capacity*** exist, err on the side of transport.

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS:

- 1 mg/ml in a 2ml prefilled syringe

NITROGLYCERIN (NTG)

PHARMACOLOGY

- Nitroglycerin stimulates cGMP (2nd Messenger) production, resulting in vascular smooth muscle relaxation. It works by relaxation of smooth muscles, producing vasodilatory effect on the peripheral veins and arteries, with stronger effect on the veins.
- Cardiovascular effects include:
  - Reduces cardiac O2 demand by decreasing pre-load (left ventricular end-diastolic pressure)
  - Modestly reduced peripheral vascular resistance.
  - Dilation of coronary arteries and relief of coronary artery spasm improving collateral flow to ischemic regions
- Generalized smooth muscle relaxation.

INDICATIONS

- Pain or discomfort due to suspected acute coronary syndrome
- Cardiogenic pulmonary edema
  - To increase venous pooling, lowering cardiac preload and afterload
- Control of hypertension in angina, acute MI, aortic dissection or hypertensive emergencies
- NTG infusion is indicated in the conditions listed above when a continuous dosing would benefit the patient. See NTG infusion protocol.

CONTRAINDICATIONS

- Hypersensitivity to nitrates
- Blood pressure < 90 systolic
- Constrictive pericarditis/Pericardial tamponade
- Recent use of erectile dysfunction (ED) medication (e.g. sildenafil (Viagra, Revatio), tadalafil (Cialis, Adcirca), vardenafil (Levitra, Staxyn), avanafil, (Stendra)
  - Nitroglycerin may cause irreversible hypotension

PRECAUTIONS / SIDE EFFECTS

- Initial dose may be given prior to the establishment of an IV if SBP is >100mmHg. Subsequent doses require IV/IO access.
- Common side effects include throbbing headache, flushing, dizziness, and burning under the tongue. These side effects may be used to check potency.
- Less common: orthostatic hypotension, sometimes marked
- Generalized vasodilatation may cause profound hypotension and reflex tachycardia especially in patients with a right-sided or inferior MI.
  - Patient should be placed in supine position and given IV fluids if this complication arises.
- Therapeutic effect is enhanced, but adverse effects are increased when patient is upright.
- Because nitroglycerin causes generalized smooth muscle relaxation, it may be effective in relieving chest pain caused by esophageal spasm.
- May be effective even in patients using paste, discs, or oral-acting nitrate preparations.
- Initiate NTG infusion after 3rd dose sublingual (see 6310 Nitroglycerin Infusion Protocol)

(CONTINUED)

NITROGLYCERIN (NTG)

ADULT ADMINISTRATION

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• 0.4 mg SL	**VO/assist**	**SO**	**SO**	**SO**	**SO**

assist = EMT-IV may assist a patient in taking his or her prescribed nitroglycerin.

Nitrates in Right Ventricular Infarction

- Right ventricular infarction complicates up to 40% of inferior STEMIs. Isolated RV infarction is extremely uncommon.
- Patients with RV infarction are very **preload sensitive** (due to poor RV contractility) and can develop **severe transient hypotension in response to nitrates** or other preload-reducing agents.
- Hypotension in right ventricular infarction is treated with **fluid loading; initial boluses of 250-500mL**, and nitrates are a contraindication in systolic BP <100 mmHg.

A right sided ECG should be performed after confirmation of inferior STEMI; Presence of elevation in V3R – V6R indicates right ventricular involvement. (The presence of an Inferior STEMI in and of itself is not a contraindication for nitro)

Nitro should only be given after fluid bolus and with systolic BP of >100mmHg in the presence of RV infarction and discontinued should BP drop below this threshold.

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS:

- 0.4 mg SL tablet

NITROGLYCERIN INFUSION (FIELD START)

PHARMACOLOGY

- Nitroglycerin stimulates cGMP (2nd Messenger) production, resulting in vascular smooth muscle relaxation. It works by relaxation of smooth muscles, producing vasodilatory effect on the peripheral veins and arteries, with stronger effect on the veins.
- Cardiovascular effects include:
  - Reduces cardiac O2 demand by decreasing pre-load (left ventricular end-diastolic pressure)
  - Modestly reduced peripheral vascular resistance.
  - Dilation of coronary arteries and relief of coronary artery spasm improving collateral flow to ischemic regions
- Generalized smooth muscle relaxation.

INDICATIONS

- Chest pain secondary to presumed cardiac ischemia, acute coronary syndrome, or acute myocardial infarction. The nitroglycerin infusion may be used for continued nitroglycerin administration in transport greater than 15 min from hospital.
- Acute pulmonary edema / CHF requiring continual nitroglycerine administration.

CONTRAINDICATIONS

- Hypersensitivity to nitrates
- Hypotension (SBP <**90**)
- Constrictive pericarditis/ pericardial tamponade
- Recent use of erectile dysfunction (ED) medication (e.g. sildenafil (Viagra, Revatio), tadalafil (Cialis, Adcirca), vardenafil (Levitra, Staxyn), avanafil, (Stendra)
  - Nitroglycerin may cause irreversible hypotension

PRECAUTIONS / SIDE EFFECTS

- Patients with right-sided heart failure from MI or other causes may become hypotensive with nitroglycerin, thus the need for frequent monitoring.
- Analgesics for side effects such as headache may be indicated
- Cautious use in patients with hepatic or renal disease.

Nitrates in Right Ventricular Infarction

- Right ventricular infarction complicates up to 40% of inferior STEMIs. Isolated RV infarction is extremely uncommon.
- Patients with RV infarction are very preload sensitive (due to poor RV contractility) and can develop severe transient hypotension in response to nitrates or other preload-reducing agents.
- Hypotension in right ventricular infarction is treated with fluid loading; initial boluses of 250-500mL, and nitrates are a contraindication in systolic BP <100 mmHg.

A right sided ECG should be performed after confirmation of inferior STEMI; Presence of elevation in V3R – V6R indicates right ventricular involvement. (The presence of an Inferior STEMI in and of itself is not a contraindication for nitro)

Nitro should only be given after fluid bolus and with systolic BP of >100mmHg in the presence of RV infarction and discontinued should BP drop below this threshold.

(CONTINUED)

NITROGLYCERIN INFUSION

ADMINISTRATION

- **10** mcg/min initially, titrated upwards by **10** mcg increments every 5 minutes if chest pain persists and systolic BP remains above 100 mmHg for control of angina. Titration should be done only with careful, frequent monitoring of hemodynamic response. Check vitals with every dosage change and every 10 min thereafter while infusing.
- If pain resolves completely, maintain infusion at current rate off administration.
- If systolic drops below 90mmHg during titration, decrease drip rate by 10mcg/min and give 250mL NS bolus IV. If BP remains below 90mmHg, discontinue infusion.
- Contact Medical control for doses above 200mcg/min

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• Initiation, titration, and monitoring of nitroglycerin infusion for chest pain associated with AMI	--	--	--	**SO**	**SO**
• Initiation, titration, and monitoring of nitroglycerin infusion for CHF exacerbation with HTN. o Initial dose to start at 60mcg/min and titrate accordingly	--	--	--	**SO**	**SO**

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS

- 50 mg in 250 ml D5W

ONDANSETRON (ZOFRAN)

PHARMACOLOGY

- Ondansetron is a selective serotonin 5-HT3 receptor antagonist antiemetic
- Blocks Serotonin 5-HT_3
  - Peripherally on vagus nerve terminals
  - Centrally on area of postrema (medullary structure in the brain that controls vomiting)

INDICATIONS

- Treatment of nausea and vomiting.
- Oral dissolving tablet effective and preferred for pediatric patients with mild dehydration without evidence of shock

CONTRAINDICATIONS

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

SIDE EFFECTS

- Very low rate of adverse effects, very well tolerated

ADMINISTRATION

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
• 4 mg IVP or IM • May repeat once in 15 to 20 minutes.	**SO**	**SO**	**SO**	**SO**	**SO**
• 8 mg ODT	**SO**	**SO**	**SO**	**SO**	**SO**

PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
≥ 4 years old • 4 mg IV/ODT	**SO**	**SO**	**SO**	**SO**	**SO**
6 months to 4 years old • 2 mg IV/ODT	**SO**	**SO**	**SO**	**SO**	**SO**
< 6 months	**VO**	**VO**	**VO**	**VO**	**VO**

PREGNANCY CLASSIFICATION

- B

SUPPLIED AS

- 4 mg in 2mL
- 4 mg oral dissolving tablet

ORAL GLUCOSE

PHARMACOLOGY

- Glucose is the body's basic source of energy 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 by glucagon, which mobilizes stored glucose into the blood stream.

INDICATIONS

- Hypoglycemia and ability to take PO

CONTRAINDICATIONS

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

PRECAUTIONS / SIDE EFFECTS

- Even though correction of glucose may be accomplished at the scene, this does not mean that other problems requiring prompt treatment can be overlooked. In the elderly patient, hypoglycemia often accompanies other serious illnesses; especially prevalent in sepsis. Many oral medications have a long duration of action and can further decrease serum glucose even after correction with dextrose. Recheck the glucose 30 to 40 minutes after administration of dextrose.

ADMINISTRATION

ALL AGES

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
One full tube 15 g buccal	**SO**	**SO**	**SO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

- C

SUPPLIED AS

- 15 grams in 1.3 oz tube

OXYGEN

PHARMACOLOGY

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

INDICATIONS

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

PRECAUTIONS / SIDE EFFECTS

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

ADMINISTRATION

- The amount and method of administration must be based on clinical judgment and the field impression of the illness.
- Use the appropriate oxygen delivery method and flow rate to achieve SpO2 of 90-96% when oxygen therapy is indicated.
- A saturation of 100% does not give the provider an indication of a true arterial oxygenation (PaO2). High PaO2 levels may cause shifts in partial pressure of CO2 and cause changes in pH
- Do not rely on pulse oximeter readings alone to determine if your patient requires supplemental oxygen. Many factors can give false or unreliable readings. Use sound clinical judgement.

OXYGEN FLOW RATES				
DEVICE	**OXYGEN CONCENTRATIONS**			
• Bag Valve Mask	80% to 100% with supplemental oxygen. At least 15 Liters / Minute			
• Nasal Cannula	24% to 40% at 5 to 6 Liters / Minute.			
• Non Rebreather Mask	Up to 90% at 15 Liters / Minute.			
PROCEDURE	**EMT B IV**	**EMT I/99**	**EMTP**	**CCP**
• Oxygen: NC, NRB, or BVM	**SO**	**SO**	**SO**	**SO**

SPECIAL NOTE: Adequate oxygenation is assessed clinically and with the SpO2 while adequate ventilation is assessed clinically and with waveform capnography.

SUPPLIED AS:

- D or S cylinders up to 2100 psi

OXYTOCIN (Pitocin)

PHARMACOLOGY:

- Oxytocin stimulates uterine contractions by acting on receptors that trigger the release of intracellular calcium and local prostaglandin production. Oxytocin specific receptors are not present in the uterus until ~13 weeks' gestation and increase as pregnancy progresses and reach maximum concentration at term. Therefore, term pregnancies are more sensitive to lower oxytocin doses. The action of oxytocin is limited by the concentration of receptors in the smooth muscle of the uterus. Repeated doses may cause desensitization of the receptors and decreased response.

INDICATIONS

- Oxytocin is indicated for females suffering severe post-partum hemorrhage – estimated to be at least 750-1000 mL

CONTRAINDICATIONS

- Hypersensitivity to oxytocin

PRECAUTIONS / COMPLICATIONS

- Prior to administration it is essential to verify that the baby has delivered, and that there is not an additional fetus in the uterus
- Ideally, Oxytocin should be given after delivery of the placenta, though retained placenta with severe bleeding is NOT a contraindication.
- IV push is not recommended; rapid IV bolus administration is associated with cardiovascular collapse. Slow IV injections (5 or 10 units over 1 minute) are preferred for patients without cardiovascular risk factors; very slow injections (>5 minutes) are preferred for patients with cardiovascular risk factors
- Effects of administration should be seen within minutes

ADMINISTRATION

Administration	EMT IV	AEMT	EMT I	P	CCP
10 units over 5 minutes very slow IVP	--	--	--	**SO**	**SO**
Followed by maintenance infusion of 10 units/hour if necessary	--	--	--	**SO**	**SO**
10 units IM if unable to establish IV access	--	--	--	**SO**	**SO**

SUPPLIED AS

10 units/ 1 mL vial

PHENYLEPHRINE (NEO-SYNEPHRINE) - INTRANASAL

PHARMACOLOGY

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

INDICATIONS

- Prior to nasotracheal intubation to induce vasoconstriction of the nasal mucosa
- Epistaxis

CONTRAINDICATIONS

- None if indications are met.

PRECAUTIONS / SIDE EFFECTS

- Avoid administration into the eyes, as it will cause dilation of the pupils.

ADMINISTRATION

- For epistaxis management, have patient blow nose to expel clots prior to administration and placement of rhino clamp

ADULT or PEDIATRIC

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
• Two sprays of 1% solution in each nostril prior to attempting nasotracheal intubation or placing rhino clamp	**SO**	**SO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- C

SUPPLIED AS

- 0.5% in spray applicator

PREGANANCY CLASSIFICATION

United States FDA Pharmaceutical Pregnancy Categories	
Pregnancy Category A	Adequate and well-controlled studies have failed to demonstrate a risk to the fetus in the first trimester of pregnancy (and there is no evidence of risk in later trimesters).
Pregnancy Category B	Animal reproduction studies have failed to demonstrate a risk to the fetus and there are no adequate and well-controlled studies in pregnant women OR Animal studies which have shown an adverse effect, but adequate and well-controlled studies in pregnant women have failed to demonstrate a risk to the fetus in any trimester.
Pregnancy Category C	Animal reproduction studies have shown an adverse effect on the fetus and there are no adequate and well-controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.
Pregnancy Category D	There is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience or studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.
Pregnancy Category X	Studies in animals or humans have demonstrated fetal abnormalities and/or there is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience, and the risks involved in use of the drug in pregnant women clearly outweigh potential benefits.

QUIKCLOT GAUZE

PHARMACOLOGY

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

INDICATIONS

- Active bleeding from open wounds with that cannot be controlled with direct pressure. Most often involving wounds to the scalp, face, neck, axilla, groin or buttocks.
    - Onset of action is 3-5 minutes after wound exposure and clotting action remains unless the dressing and/or the clot is disturbed.

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 / SIDE EFFECTS

- Bleeding control is achieved via combination of direct pressure and hemostatic gauze packing for a minimum of 3-5 minutes.
- Stabilize patient per 4120 Trauma treatment protocol
- If a tourniquet is indicated (see 1240 Tourniquet protocol), it should be applied first, before application of hemostatic agent.

ADMINISTRATION

ALL AGES

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
Application of or wound packing with QuikClot Gauze	**SO**	**SO**	**SO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

NA

SUPPLIED AS

- Roll or z pack of hemostatic gauze

RACEMIC EPINEPHRINE

PHARMACOLOGY

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

INDICATIONS

- Stridor at rest
- Upper airway hemorrhage (e.g. post-tonsillectomy hemorrhage)

CONTRAINDICATIONS

- Pulmonary edema

PRECAUTIONS / SIDE EFFECTS

- Utilize parents whenever possible as the mask may frighten children
- Racemic epi is heat and photo-sensitive
  - Discoloration is an indication to discard
- 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
- If respiratory arrest occurs, it is usually due to laryngospasm or fatigue. Complete airway obstruction is usually not present. Ventilate with 100% FiO2 and rapid transport is indicated.
  - If you can ventilate intubation is best left to the ED
- Can Cause:
  - Tachycardia
  - Palpitations
  - Muscle tremors
  - Blanching of the face

ADMINISTRATION

ALL AGES

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
0.5 mL racemic epinephrine bullet mixed with 3 mL normal saline via nebulizer at 6-8 LPM	--	--	**SO**	**SO**	**SO**

PREGANANCY CLASSIFICATION

- C

SUPPLIED AS

- 11.25 mg in 0.5 mL bullet

ROCEPHIN (Ceftriaxone)

PHARMACOLOGY

- Antibiotic, Cephalosporin. Inhibits bacterial cell wall synthesis by binding to one or more of the penicillin-binding proteins (PBPs) which in turn inhibits the final transpeptidation step of peptidoglycan synthesis in bacterial cell walls, thus inhibiting cell wall biosynthesis. Bacteria eventually lyse due to ongoing activity of cell wall autolytic enzymes (autolysins and murein hydrolases) while cell wall assembly is arrested.

INDICATIONS

- Patients with signs of sepsis not currently being treated with antibiotics (see ***2260 Sepsis Protocol***).

CONTRAINDICATIONS

- **Penicillin** or beta-lactam allergy.

PRECAUTIONS / SIDE EFFECTS

- Hemolytic anemia: Severe cases (including some fatalities) of immune-related hemolytic anemia have been reported in patients receiving cephalosporins, including ceftriaxone.

ADMINISTRATION

- 2 gm mixed in 100 mL NS given over 30 minutes.

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	CCP
2 gm infused over 30 minutes	--	--	--	**SO**	**SO**

PREGNANCY CLASSIFICATION

B

SUPPLIED AS

1 gram vial requiring reconstitution

ROCURONIUM

PHARMACOLOGY

- Rocuronium is a short onset, long-acting non-depolarizing, neuromuscular blocking agent. Muscle paralysis is produced by competing with acetylcholine for cholinergic receptor sites at the neuromuscular junction. The muscle paralysis proceeds from eyes, face, neck, limbs, chest, abdomen, and lastly the diaphragm.

INDICATIONS

- Patients requiring Chemically Facilitated Intubation (*see **1070 Chemically Facilitated Intubation protocol***) for airway management

CONTRAINDICATIONS

- Known hypersensitivity to Rocuronium.

PRECAUTIONS / SIDE EFFECTS

- Apnea- lasts 30-60 minutes. Avoid use of Rocuronium if ventilation not possible after failed intubation attempt.
- Avoid maintaining paralysis if destination within 10 minutes. Alert the hospital that the paralytic is wearing off so that they can administer more after the patient's arrival.
- The onset of action is between 1-2 minutes. This may be delayed in patients with liver and cardiac disease. The duration of action may be prolonged in patients with a history of liver disease.

ADMINISTRATION

ADULT

PROCEDURE	EMT IV	AEMT	EMT I/99	EMTP	PCC
• 1mg/kg for induction	--	--	--	**SO**	**SO**

- Onset for above dose: 1-2 minutes; Duration: approximately 45 min.

PREGNANCY CLASSIFICATION

B

SUPPLIED AS

100mg / 5mL vial

SODIUM BICARBONATE

PHARMACOLOGY

- In the presence of H^+ ions, sodium bicarbonate dissociates into Na^+ and HCO_3 (bicarbonate), the HCO_3 picks up a H^+ ion changing to carbonic acid (H_2CO_3) which than dissociates into H_2O and CO_2, functioning as an effective buffer and alkalinizing the blood.
- $NaHCO_3$ increases plasma bicarbonate, which can buffer metabolic acids and move TCA's off receptor sites and back into circulation.
- $NaHCO_3$ can also shift K^+ from the extracellular to the intracellular space by increasing blood pH.
- Reason for administration is to increase potassium reuptake into cells

INDICATIONS

- Suspected hyperkalemia as evidenced by wide QRS or sine wave on ECG. Often seen in patients with a history of renal disease.
- Tricyclic overdose with arrhythmias, widened QRS complex, hypotension, seizures
- Dialysis patients in cardiac arrest
- Suspected cyanide poisoning with widened QRS (in conjunction with hydroxocobalamin)

CONTRAINDICATIONS

- DO NOT administer Sodium Bicarb using the same IV lines as Epi, Dopamine, Calcium, or Dilantin.
- Metabolic or Respiratory alkalosis.
- Severe pulmonary edema.
- Abdominal pain of unknown origin.
- Hypocalcemia. Hypokalemia. Hypernatremia.

PRECAUTIONS / SIDE EFFECTS

- May increase cerebral acidosis, especially with patients suffering from DKA.
- Sodium bicarbonate administration increases CO_2 which rapidly enters cells, causing a paradoxical intracellular acidosis.
- Each ampule of sodium bicarbonate contains 44-50 mEq of sodium. This increases intravascular volume, which increases the workload of the heart.
- Hyperosmolality of the blood can occur, resulting in cerebral impairment.
- Sodium bicarbonate's lack of proven efficacy and its numerous adverse effects have lead to the reconsideration of its role in cardiac resuscitation. Effective ventilation and circulation of blood during CPR are the most effective treatments for acidemia associated with cardiac arrest.
- Administration of sodium bicarbonate has not been proven to facilitate ventricular defibrillation or to increase survival in cardiac arrest. Metabolic acidosis lowers the threshold for the induction of ventricular fibrillation, but has no effect on defibrillation threshold.
- The inhibition effect of metabolic acidosis on the actions of catecholamines has not been demonstrated at the pH levels encountered during cardiac arrest.
- Metabolic acidosis from medical causes (e.g. diabetes) develops slowly, and field treatment is rarely indicated.
- Sodium bicarbonate may be considered for the dialysis patient in cardiac arrest due to suspected hyperkalemia.

(CONTINUED)

SODIUM BICARBONATE

ADMINISTRATION

ADULT

PROCEDURE	EMT - IV	AEMT	EMT I/99	EMTP	CCP
Hyperkalemia, Dialysis Patient **Cardiac Arrest, Suspected Cyanide Poisoning** • 1.0 mEq / kg IVP	--	--	**VO**	**SO**	**SO**
Tricyclic Antidepressant Overdoses • 1-2mEq/kg, repeat q 5 minutes until QRS duration is <100ms	--	--	--	**SO**	**SO**

PEDIATRIC (1 to 8 years of age)

PROCEDURE	EMT - IV	AEMT	EMT I/99	EMTP	CCP
Hyperkalemia • 1.0 mEq / kg IVP	--	--	**VO**	**SO**	**SO**
Tricyclic Antidepressant Overdoses • 1-2mEq/kg, repeat q 5 minutes until QRS duration is <100ms.	--	--	--	**SO**	**SO**

PREGNANCY CLASSIFICATION

- **C**

SUPPLIED AS

- Adult/Pediatric: 8.4% (1 mEq/ml) in a 50 mL vial

TRANEXAMIC ACID (TXA)

PHARMACOLOGY

- Tranexamic acid (TXA) competitively inhibits activation of plasminogen, thereby reducing conversion of plasminogen to plasmin (fibrinolysin), an enzyme that degrades fibrin clots, fibrinogen and other plasma proteins, including procoagulant factors V and VIII.

INDICATIONS

- Assessment findings in the acute trauma patient (< 3hours from incident) and history indicate potential significant hemorrhage, either internal or external, that will likely require blood product transfusion in ED.
    - Findings include;
        - Tachycardia >110
        - Systolic BP <90mmHg
        - In addition, look for flaccid vasculature, pale skin/gums, AMS
- Hypotension (< 90 mmHg) secondary to post-partum hemorrhage that is refractory to fundal message and fluid boluses
- Uncontrolled post-operative hemorrhage
- Suspected non-compressible hemorrhage
- Epistaxis refractory to phenylephrine and pressure

CONTRAINDICATIONS

- Hypersensitivity to tranexamic acid or any component of the formulation
- Unknown time of onset of injury or injury > 3 hours

PRECAUTIONS / SIDE EFFECTS

- Thrombotic events: Venous and arterial thrombosis or thromboembolism, including central retinal artery/vein obstruction, has been reported. Use the injection with caution in patients with thromboembolic disease.
- Seizure: Seizures have been reported with use; most often with intraoperative use and in older patients. The mechanism by which tranexamic acid use results in seizures may be secondary to neuronal gamma aminobutyric acid (GABA) inhibition. Be prepared to treat with higher than normal doses of benzodiazepines.
- Ocular effects: Visual defects (e.g., color vision change, visual loss) and retinal venous and arterial occlusions have been reported.
- Do not administer in the same line as blood products
- Use caution in patients with thromboembolic disease

ADMINISTRATION

- 2 g slow IV push (~ 2 min) initial dose
- For epistaxis saturate gauze with TXA and insert into affected naris after forceful blowing to remove clot apply rhino clamp and transport to ED

(CONTINUED)

TRANEXAMIC ACID (TXA)

PROCEDURE	EMT IV	AEMT	EMT I/99	EMT P	CCP
ADULT TRAUMA PATIENT • **2 g slow IVP**	**--**	**SO**	**SO**	**SO**	**SO**
Pediatric Trauma Patient • **30 mg/kg – max dose 2 G**	**--**	**SO**	**SO**	**SO**	**SO**
POST PARTUM HEMORRHAGE • **2 g Slow IVP**	**--**	**SO**	**SO**	**SO**	**SO**
EPISTAXIS • Saturate gauze with 500-1000 mg (5-10 mL) and insert into affected naris - place rhino clamp and transport to the ED • Pediatric max volume 0.5 mL per naris • Maximum dose 3 G	**SO**	**SO**	**SO**	**SO**	**SO**

PREGNANCY CLASSIFICATION

- B

SUPPLIED AS

- **1g (1000mg)** in **10**mL vial