# Mercyhealth
# Prehospital & Emergency Services Center
# Medical Guidelines
# For
# Wisconsin EMS Providers

These guidelines have been reviewed and approved for use by the following leadership:

EMS Medical Director:
Christopher Wistrom, DO, FACEP, CI

Associate EMS Medical Directors:
Jibril Ashiru-Balogun MD, MS
Richard Barney, MD, FACEP
Anthony DiCianni, DO
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Matthew Smetana, DO, FACEP, NRP, CPE
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EMS System Director:
Brandon Lieber, BS, EMT-P

EMS Manager:
Joe Murray Jr. MPA, EFO, CFO, EMT-P

EMS Coordinator:
Illinois - Don Crawford, EMT-P
Wisconsin - Joe Murray Jr. MPA, EFO, CFO, EMT-P

With special gratitude to the telecommunicators, EMS providers, firefighters, and law enforcement officers who have contributed to not only these guidelines but improving public safety in the community. We are grateful for your efforts and sacrifice.

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# SECTION 1 MERCY EMS ADMINISTRATIVE GUIDELINES

# 1.01 INTRODUCTION

I. It is the understanding of the EMS Medical Director that **care is to be initiated** for all patients upon assessment. Care will be provided in accordance with Wisconsin Department of Health Services (DHS) rules and regulations, applicable laws, and these medical guidelines for WI EMS providers.

**II. Guideline Use**

A. Only Mercyhealth EMS providers that have been credentialed by the EMS Medical Director may utilize these guidelines clinically.

B. Ambulances will be equipped with a copy of these guidelines (availability of electronic copy is sufficient), all necessary patient care equipment, medications at the appropriate service level, and communications equipment (cellular phone, mobile and portable radios). This is in addition to any state and EMS system equipment and supply requirements.

C. The following guidelines are to be used by all EMS Personnel under the Mercyhealth EMS System in the prehospital setting any time contact with a patient has been made. When practical, the guidelines have been aligned with other regional EMS standing orders and guidelines.

D. Find the appropriate Guidelines. Carry out instructions as written in the Guidelines.

E. It is expected that each provider will maintain a functional knowledge of the most updated Medical Guidelines.

F. These guidelines are in effect until the patient arrives at the receiving facility and the patient's care has been turned over to appropriate medical and/or nursing staff.

**III. Patient Access and Care**

A. All accessible patients shall have an assessment to the extent allowed if there is a potential for illness or injury based on the circumstances.

B. A reasonable search of the safe scene must be completed to determine if a patient is present. If after a reasonable search, no patient is identified, efforts to find the patient shall be documented in accordance with EMS agency policies.

1. Consult medical direction in situations in which EMS in unable to access patient or provide care due to unsafe circumstances.

C. All information obtained during patient care delivery is confidential.

D. All patients must be properly restrained during transport using age/weight/size appropriate securing devices.

E. **SALT Mass Casualty Triage Algorithm** (Sort, Assess, Lifesaving Interventions, Treatment/Transport) is the EMS Medical Director approved triage method. In a mass casualty situation, EMS providers may be working with other providers that utilize different triage systems.

F. **Blood glucose** should judiciously be checked with a properly calibrated glucometer when it may guide emergency patient care.

1. Routine use of blood glucose meters on alert patients without recent signs or symptoms including dizziness, weakness, palpitations, falls, diaphoresis, confusion, neurologic deficit, or altered mental status is usually not clinically indicated.
2. Blood glucose evaluation should not be routinely prioritized during cardiac arrest.

## IV. Documentation

A. A **patient care report (PCR)** or other approved documentation will be completed and signed for every prehospital emergency response in accordance with WI DHS regulations and EMS System Policies/Procedures.

1. For transports, generally, the PCR should be completed and provided to the receiving facility immediately prior to departing the facility.
2. If a PCR cannot be completed prior to departing the ED, then an **approved Short/Non-Transport Form** must be fully completed and left with the ED staff.
    a) If the Short/Non-Transport Form is utilized the PCR will then be completed and transmitted to the receiving facility within the timeline specified by DHS.

B. **EMR providers** are required to submit a PCR to WARDS whenever they perform any skills, administer any medications, or use any equipment in caring for patients that are categorized as *optional ("O")* advanced skills under the Wisconsin EMS scope of practice, as outlined in Wis. Admin. Code § DHS 110.34 (8).

C. Documentation for refusals or non-transport situations, including those by non-transport agencies, will be completed within 24 hours.

## V. Medical Direction

A. The Mercyhealth EMS Medical Director, an on-duty Mercyhealth EMS Physician, or a Mercyhealth Online Medical Direction Physician is available for consultation via phone. EMS providers can be patched to one of these providers by calling RockCom at (815) 968-0993.

B. All actions and treatments not qualified by the statement "Contact medical direction" may be carried out without specific medical order or contact with medical direction.

C. Actions qualified by the statement "Contact medical direction" must have a verbal order from the appropriate online or on-scene medical direction.

1. Repeat the orders to medical direction exactly as you receive them; and once confirmed, carry them out exactly as ordered.

D. If, in your opinion, the orders you receive are inappropriate and/or dangerous to the patient:

1. Question the medical direction order up to three (3) times regarding the rationale for those orders.
2. If you are still in doubt, then verbally state your refusal to act.
3. Document this on your run sheet and include the time, the order(s), and your reason for refusal. A copy of the run sheet documenting refusal of online medical direction orders should be directly forwarded to the EMS System within 72 hours. Locking and signing the ePCR does not fulfill this requirement.

E. The on-duty EMS Physician should be notified within 72 hours for any the following:

1. Significant departure from policy, procedure, or guideline on direct patient care.
2. Any situation which is not consistent with routine operations, system procedures or routine care of a particular patient. This may be any situation, condition or event that has or may have adversely impacted the patient, a co-worker, or the EMS system.
3. Medication and/or treatment issues and/or equipment failures that resulted (or may have resulted) in harm.
4. Medical direction was indicated but unavailable or concerns regarding medical direction.
5. EMS system provider acting outside their license or scope of practice.
6. Violence toward EMS providers that results in injury or prevents the provider from delivering appropriate patient care.

7. Any injury that occurred to a patient or EMS provider during treatment or transport.
8. Any patterns of job performance that indicate skill decay or knowledge deficiencies affecting patient care.

F. If communications cannot be established, are disrupted, or lost between the EMS provider and medical direction, document the **communication failure** and continue to follow these guidelines including orders which typically require a verbal order. Every effort should be made to contact medical direction by cell phone, radio, or landline telephone.

G. Under no circumstance shall EMS personnel delay patient care while attempting to establish contact with online medical direction.

H. In situations where immediate action to preserve and save lives supersedes the need to communicate directly with online medical direction, the requirement for online medical direction orders may be lifted provided guidelines/recommendations are followed and/or sound medical judgment is used. The EMS Medical Director or On-Call EMS Physician must be promptly made aware of these types of occurrences within 72 hours.

I. Patient care is unpredictable by its nature. In all circumstances, on-line/on-scene medical direction has the latitude to deviate from these guidelines if it is believed that deviation is in the best interest of the patient. Such deviations should in no way detract from the high level of patient care expected from EMS personnel.

J. If doubt exists as to the best course for patient care, contact online medical direction as soon as feasible.

K. **To request a physician response** to an incident, contact RockCom at (815)968-0993. The EMS Medical Director, On-Call EMS Physician, or other personnel may respond with EMS when available and may respond to any call at their discretion to provide on-scene assistance, real-time education, and quality assurance activities.

L. The **receiving hospital** is authorized to provide online medical direction for patients being transported to their facility. In the event a patient is being transferred between two healthcare facilities, the sending facility must develop a treatment plan for transport. See separate interfacility transport guidelines for interfacility purpose, policy, medical direction, and considerations for interfacility transport.

M. **MD-1 response** will supplement field personnel; they will provide treatment, oversight, assistance and quality assurance; they will work under the existing incident command structure.

1. Care should not be delayed awaiting their arrival.
2. Ambulances should initiate transport as soon as able, intercepting with MD-1 where possible.
    a) If the situation changes and a response is no longer requested, the incident commander may request the response cancellation.
3. The Mercyhealth EMSMD, Associate EMSMDs, and EMS Physicians have the authority to perform all skills and utilize all medications in these guidelines.
    a) In addition, Mercyhealth EMS Physicians may independently utilize additional therapeutics and skills approved by the EMS Medical Director.
    b) Examples include tube thoracostomy, nerve blocks, use of ultrasound, wound closure, fracture care, dislocation reduction, junctional tourniquets, central venous access, lateral canthotomy, emergency amputation, blood and blood product administration and resuscitative hysterotomy.

N. Examples of incidents when a physician response may be beneficial if available (not all inclusive):
   1. Mass Casualty situations
   2. Prolonged entrapments
   3. Structural collapse
   4. Multiple alarm fires
   5. To provide surgical intervention
   6. To provide on-scene medical direction at major incidents
   7. Mass gatherings and special events
   8. To provide operational and logistical support at prolonged incidents
   9. Other incidents where the Incident Commander determines their assistance would be of value
   10. Additional medications not routinely carried by EMS (ex. Antibiotics for open fractures, Cyanokit, Pitocin for post- partum hemorrhage) would provide benefit to the patient

## VI. Pediatrics

A. Care of Pediatric patients is addressed within each appropriate clinical care guideline. A pediatric patient is identified as having not started physical changes of puberty. Any patient who has gone through puberty should receive the adult dose of medication.

B. Although the medication doses vary, the procedures seldom change. Any specific adjustments for pediatric patients are highlighted and identified where needed.

C. Weight-based dosing should be used for all patients, particularly pediatric patients in whom it is critical for correct dosing.
   1. If a current weight is not available, the use of current medical director approved length-based adjuncts such as the Broselow tape and Pediatape is acceptable.
   2. If a pediatric patient does not fit on Broselow tape, then ½ the adult dose is a suggested guideline for prepubescent patients.
   **3. The maximum pediatric dose should not exceed the adult dose.**

D. Pediatric endotracheal tubes shall be cuffed except 2.0 mm.

E. Patients <18 years of age should have consent of a parent or guardian obtained prior to treatment unless they qualify as an emancipated minor or for care under implied consent.

F. Pacemaker/defibrillation equipment should be available for pediatric/infant patients per manufacturer recommendations.

VII. **All medical devices**, IV pumps, ventilators, medications, and instruments must be approved by the EMS Medical Director prior to patient use.

A. Additional equipment approval may be contingent on an approved training plan. Reference to specific makes, models, or manufacturers in these Guidelines is for illustrative purposes only and is not an endorsement.

B. Any guides, references, notes, and patient care forms, whether in written or electronic format must be approved by the EMS Medical Director.

## VIII. Credentialing and Qualifications

A. All EMS providers, at all certification levels, are required to successfully complete an EMS System credentialing process established by the EMS Medical Director prior to providing any patient care. EMS providers may routinely be evaluated by skills evaluation, simulation, written exams, and QA/QI activities after initial credentialing. Any providers deemed by the Medical Director to be operating in an unsafe manner will be immediately suspended or de-credentialed from patient care activities. Any EMS providers requiring remediation will do so in the manner

prescribed by the EMS Medical Director. Failure to follow the EMS System policies may result in disciplinary action up to suspension of patient care activities.

B. All EMS providers and students will always adhere to EMS Medical Director and EMS System minimum qualifications, guidelines, training, and skills requirements. Any provider or student not in compliance may be suspended from patient care activities until they are current with all EMS Medical Director requirements. Providers may not utilize medications, devices, or perform skills that they are not trained and credentialed to use.

C. All EMS providers performing Rapid Sequence Airway (RSA) will be required to complete additional RSA training, airway skills, and evaluation per EMS Medical Director requirements.

D. Where a skill or medication is mentioned for specific indication in a guideline for Paramedics, the Intermediate EMT (I99) may perform those listed below. An Intermediate EMT (I99) will be required to meet the same system education and skill requirements of the Paramedic prior to acting in this role. Only an Intermediate EMT (I99) approved and credentialed by the EMS Medical Director will act in this capacity.

1. The Intermediate EMT (I99) shall only perform the following skills above AEMT level: ECG interpretation and monitoring, Valsalva maneuver, Morgan lens eye irrigation, endotracheal intubation, Magill forceps, stoma suctioning, starting and maintaining external jugular IV access, drawing blood, administration of medications per rectum or IV infusion (without pump), needle decompression for thoracic injury, electrical cardioversion, manual defibrillation, and pacing.
2. The Intermediate EMT (I99) shall only administer the following medications per Paramedic guidelines above the AEMT level: adenosine, amiodarone, atropine, benzodiazepines, dextrose, epinephrine, fentanyl, and lidocaine.

E. *RN/PA/MD/DO Equivalency* – A physician, physician assistant, or registered nurse may take the place of any EMT at any service level provided he or she is trained and competent in all skills, medications and equipment used by that level of EMT in the prehospital setting and provided he or she is approved and locally credentialed by the EMS Medical Director. Note: A physician assistant or RN may not practice at a higher level of care than the level at which the service is licensed.

## IX. Medications

A. **Substitution** of generic medications and auto-injectors is considered equivalent and acceptable even if these medications are not specifically named in the guidelines. Substitution for alternative medications during drug shortages or other situations will be addressed in real time by the Medical Director.

B. Providers should consider contacting online medical direction for orders to administer a **medication the patient is prescribed but not within the scope** of your *Approved Medication List* in situations where receiving the medication is perceived to be time-sensitive and significantly beneficial. Online medical direction may choose to allow the provider to administer the medication so long as the route of administration is within that provider's scope of practice.

C. All medications will be administered utilizing the 5 rights of medication administration: right patient, right drug, right dose, right route, and right time.

D. Assess for allergies and adverse reactions before initiating/continuing medications.

E. All patients will be reassessed after each intervention and medication administration and their response to treatments will be documented in the PCR.

F. Agency **controlled substance** policies are to be reviewed and approved by the EMS system and agency representatives. Controlled substances must be stored securely with the utmost oversight. Vehicle audit trail electronic safes should be used to store controlled substance unless another storage process is approved by the EMS Medical Director. Any discrepancy must be reported immediately to the EMS System Coordinator.

G. **High risk medications** such as Epinephrine, paralytics or any mixed medications should be labeled with high visibility markings.

1. Epinephrine 1 mg / 1 mL should be easily identified for IM use only. Placing it with a small volume syringe and IM needle will further reduce risk.
2. Succinylcholine, Rocuronium and Vecuronium should be clearly identified as paralytics.

## X. Firearm Interaction and Wisconsin Concealed Carry Law

A. Overview

1. The 2011 Wis. Act 35 regarding concealed carry licenses authorizes registered individuals to possess a concealed firearm on a daily or routine basis. This policy will be a commonsense guide for the EMS provider in dealing with the firearm during patient care procedures. While it is not an exhaustive list of possible situations, it will give guidance during most situations.
2. This document will be a commonsense guide for the EMS provider in dealing with the firearm(s) during patient care situations. While it is not an exhaustive list of possible situations, it will give guidance during most situations.
3. Generally, the safest place for the firearm in patient care situations is in the accompanying holster and secured away from the patient care area. EMS providers will need to ask if the patient is armed before making the decision to start an evaluation. It may be necessary to remind the patient that State Law generally prohibits firearms on a hospital campus.
4. If the EMS provider feels threatened or that the scene is unsafe, then follow department/agency procedures for scene safety.
5. EMS providers should never attempt to unload a firearm, regardless of their experience with firearms.
6. Providers should make arrangements with law enforcement to assist with these situations.
7. Relinquish firearm only to law enforcement, security personnel, or another qualified person.
8. Treat all weapons as if they are loaded.
9. Patient care should never be compromised due to the presence of a firearm. This includes transporting to the hospital where law enforcement can rendezvous with EMS to take custody of the firearm.
10. A chain of custody form may be necessary to reduce the potential of losing the firearm or ammunition while patient care is being administered. Consult local authorities or receiving hospital for such a form.

B. When approaching a scene where the patient may be carrying a firearm, several scenarios are possible and should be handled in one of the following manners:

1. If the patient is at their private residence, have the patient remove the firearm and holster as one unit and leave it secured at the residence.
2. If law enforcement is at the scene during situations such as a traffic accident or public encounter, request the officer to secure and take custody of the firearm.

a) If the patient is unable to remove the holstered firearm due to illness/injury, including altered mental status, remove the holstered firearm with law enforcement assistance (cut or unbuckle holster straps) for securement.
b) If the holster is contaminated with blood or bodily fluid, have the officer don gloves before touching the holstered firearm. Provide a plastic or biohazard bag if necessary.
c) Belligerent, combative, or uncooperative patients that are suspected of having a firearm should not be approached until law enforcement arrives or the scene is otherwise made safe.

3. If law enforcement is not on scene to take custody of the firearm, place the holstered firearm in a lockable firearm transport away from patient if available.
4. If the patient has the firearm in a pocket without a holster, use extreme caution in retrieving it from the clothing, handling it only by the handle. Never attempt to unload the firearm or handle the trigger area. Avoid trying to manipulate or change the safety on a firearm. Have one crewmember place the gun in a safe or secure location in the home or lockable firearm transport box until law enforcement arrives.
5. If the patient is to be transported by helicopter from the scene or a rendezvous point, leave the firearm with arriving law enforcement or notify local law enforcement of the situation. Do not send the firearm in the helicopter.
6. On arrival to the hospital, if the hospital has a secure location, such as a gun safe currently used by law enforcement, place the firearm, holstered, if possible, in the gun safe and notify law enforcement or a qualified hospital security agent.
7. Make arrangements for law enforcement to meet the ambulance at the hospital and take custody upon arrival in the ambulance bay or parking area. Ideally law enforcement will take custody of the firearm at the scene.
8. Firearms may be carried in a purse or bag rather than a holster. The safest approach is to leave the firearm in the purse or bag, turning it and the contents over to law enforcement to secure the firearm. The purse or bag can be returned to the patient once the firearm is removed and secure.
9. It may be considered a refusal of care if a patient will not remove or relinquish their firearm. Contact online medical direction for any situation of this type.

## XI. Dispatch

A. All transport units should be dispatched via a dedicated method. The officer or crew should acknowledge the dispatch or as appropriate call en route, on-scene, and at the initiation of transport and on arrival to receiving facility. The ambulance should notify the dispatcher when they are available or back in service. Communications must be reliable and redundant, and the dispatch center must know the EMS system resources allocation in real time.

B. Once dispatched, the EMS crew is obligated to respond to the incident barring mechanical failure, uncontrollable barrier, or safety event. Assuring that someone is responding to the incident is a critical responsibility of both the crew and dispatch center.

C. Agencies must have a policy established with their dispatch center of steps to be taken autonomously under protocol in the event of communications failure or a non-response situation.

D. If a response is canceled while en route due to **corrected dispatch information** requiring dispatch of an alternate unit, you should proceed to provide initial care and then hand off patient care to

the transporting ambulance when they arrive. If the other ambulance will arrive first, then you can end your response and return if they do not need further assistance.

E. Once dispatched, **downgrading** to non-emergent response may be reasonable based on dispatch information. A response should only be canceled by appropriate authority or after an attempt to assess or locate the patient is unsuccessful.

## XII. Abuse/Neglect:

A. First ensure scene safety.

B. Treat all injuries or emergency medical conditions identified per these Prehospital Medical Guidelines and provide psychological support.

**C. Mandatory Abuse Reporting Criteria**

1. EMS Providers are mandatory reporters of some specific types of abuse under Wisconsin Statutes 48.981 (2). Any suspected abuse which falls into mandatory reporting criteria should be immediately reported to the County where the child resides or to the law enforcement of where the possible abuse and/or neglect occurred to provide immediate safety for at risk individuals.
    a) In addition to completion of mandatory reporting to an appropriate agency, EMS should report their suspicions to the receiving facility's physician or staff in addition to providing documentation on the EMS PCR.
    b) Ensure mandatory reporting is completed and documented after safety of EMS and at-risk individual is accomplished.

**D. Child Abuse**

1. Local Child Protective Services (CPS) can be reached through a 911 dispatcher.
2. On the patient care report carefully document history and physical findings, environmental surroundings, child's interaction with parents or guardians, discrepancies in the history obtained from the child, bystanders, parents or guardians, etc.
3. Treatment of Suspected Child Abuse/Neglect
    a) Treat obvious injuries.
    b) If parent or guardian refuses to let you treat and/or transport the child, remain at the scene. Contact online medical direction and request police assistance. Request that the officer place the child in protective custody and assist with transport.
    c) A law enforcement officer, physician or a designated CPS employee may take or retain temporary protective custody of the child.
    d) In the instance that a child has a life, limb, or sight threatening illness or injury AND the caregivers are refusing evaluation, the child should be transported to the closest appropriate facility, with simultaneous contact of Law Enforcement and online medical direction.
    e) Any person acting in good faith in the removal of a child shall be granted immunity from any liability as a result of such removal.

E. **Elder Abuse** (60 years and older) and Adults-At-Risk (18-59 years) with Disabilities Abuse

1. All EMS personnel who have reasonable cause to believe a geriatric patient may be abused or neglected shall report the circumstances to the appropriate authority upon completion of patient care.
2. Reporting number for Geriatric Abuse:

a) Adult Protective Services (APS) can be reached through the Elder Abuse Hotline, 833-586-0107.

b) Nursing Home Abuse - Suspected victims of nursing home abuse or neglect are to be reported to the APS Division of Quality Assurance.

3. If there is reason to believe the geriatric patient has been abused/neglected, EMS personnel shall make every reasonable effort to transport the patient. If transport is refused, request police assistance if indicated.

**F. Domestic Abuse**

1. All EMS personnel who have reasonable cause to believe a patient is the victim of domestic assault and/or violence shall provide immediate and appropriate referral information to the patient. This requirement will be fulfilled by the receiving hospital.

a) If someone is a victim of domestic violence and/or is in immediate danger, advise them to call 911 for law enforcement response.

b) Information about shelter and alternatives is available through End Domestic Abuse Wisconsin, the Wisconsin statewide membership organization representing domestic abuse victim service providers and survivors. Their 24-hour regional crisis or help lines can be found online at: *https://www.endabusewi.org/get-help/*

2. If there is a reason to believe a patient is a victim of domestic assault and/or violence, EMS Personnel shall make every reasonable effort to transport the patient. If transport is refused, request police assistance if indicated.

**G. Human Trafficking**

1. Human trafficking is the misuse of other people. This often happens for the purpose of sexual exploitation or forced labor. Trafficking can occur at any age. Human traffickers often recruit vulnerable youth with force or deception. They may exploit youth through fraud, abuse of power, control, violence, or physical abduction. They may also threaten the youth or their family. Economic pressure can make a person more vulnerable to being trafficked. Trafficking occurs in cities, suburbs, and rural areas. It is a statewide issue. Many youths who are being trafficked do not see themselves as victims. They may not realize they are being trafficked.

a) The *Wisconsin Child Sex Trafficking and Exploitation Indicator and Response Guide* (available online) can help determine whether suspected cases should be referred to the Department of Children and Families (DCF) Anti-Human Trafficking website (*https://dcf.wisconsin.gov/ys/aht*), CPS, or local law enforcement.

**H. School Violence**

1. Wisconsin law 175.32 requires that any mandated reporter who believes in good faith, based on a threat made by an individual seen in the course of professional duties regarding violence in or targeted at a school, that there is a serious and imminent threat to the health or safety of a student or school employee or the public, make a report to law enforcement.

I. If there is reason to believe one of the above patients has been abused/neglected, EMS personnel shall make every reasonable effort to transport the patient. If transport is refused, request police assistance if indicated.

J. For victims of sexual assault see section *1.05 Crime Scene Management*

# 1.02 UNIVERSAL PRECAUTIONS

**Key Considerations:** Assume all patients may be carriers of infectious/contagious disease. If a specific contagion is identified, respond with additional personal protective equipment (PPE) as appropriate. If the specific or suspected disease etiology dictates, provide PPE to patient. Masks may be placed on the patient if it will not interfere with the airway, oxygenation, or other patient care procedures. Consider contagions from bodily fluids, mucous membranes, non-intact skin, body issues, and medications/drugs/illicit substances when providing patient care.

I. **Gloves/Hand Hygiene**:
   - A. New gloves should be worn for each patient contact.
   - B. Gloves used in the patient care area should not be worn in the driver's compartment.
   - C. Hands must be cleansed after glove removals and between patient contacts. Soap and water are preferred, but when it is impossible to wash hands, personnel shall use an antiseptic hand cleanser.
   - D. Gloves are to be disposed of after single use. New gloves should be worn for each patient contact.
   - E. All personnel shall wear gloves under the following conditions:
     1. If you may be in contact with blood or blood products or other bodily fluids and secretions.
     2. During contact with articles or surfaces potentially contaminated by the patient.
     3. During placement of intravenous lines or while drawing blood.
     4. While doing any other surgical or invasive procedure.
     5. While cleaning re-usable equipment contaminated with bodily fluids or blood.
     6. During all decontamination procedures.

II. **Respiratory Protection**
   - A. Masks should be worn any time there is risk of splash, spray, or aerosolization of body fluids.
   - B. Properly fitted N95 masks or other agency approved respirators should be used when caring for patients with respiratory transmissible diseases.
     1. Each EMS agency is responsible to ensure all EMS system participants are appropriately fitted with respiratory protection in accordance with OSHA and IDOL guidelines and requirements as appropriate.
   - C. Masks should be placed on patients or over oxygen delivery devices as source control of respiratory borne illness as indicated.
   - D. Consider potential respiratory contagion in a closed ambulance and ventilate accordingly.
   - E. When possible, HEPA filters should be utilized in the respiratory circuit.
   - F. Reduce aerosolizing procedures in patients with potential respiratory transmitted diseases when possible. Consider isolation of the cab of the ambulance during transport.
   - G. Aerosol procedures may need to be discontinued while transporting the patient through the Emergency Department. Communicate early with the receiving facility.
   - H. Direct mouth-to-mouth resuscitation is not recommended. If ventilatory support is necessary, a resuscitation mask with one-way valve and filter or bag-valve-mask should be used.

I. **EYE PROTECTION**
   - A. Eye protection should be worn when there is risk of splash, spray or aerosolization of body fluids.
   - B. Eye protection should be worn during airway interventions or when suctioning.

C. EMS personnel wearing prescription glasses should utilize additional eye shielding when eye protection is indicated.

II. **GOWNS**

A. A gown should be worn any time there is risk of splash, spray or aerosolization of body fluids.

B. EMS provider clothing contaminated with blood or body fluids should be appropriately laundered or discarded according to OSHA guidelines and requirements.

III. **NEEDLE STICK INJURIES and SIGNIFICANT EXPOSURES**

A. All needles and sharps should be handled with extreme care and disposed of in puncture-proof, sealed containers. Used needles should in no way be manipulated by hand.

B. Blunt fill needles, self-blunting needles, and safety catheters are to be utilized when possible. The use of non-safety style devices may be considered hazardous. Use of extension sets to draw blood and start the IV will additionally reduce the amount of contact with blood.

C. Do not recap needles.

D. Personnel who have a needle stick or an exposure of their own blood stream, mucous membrane, or eye with bodily secretion from a patient should notify the Emergency Department to which the patient was transported. The receiving hospital Emergency Department Charge Nurse or appropriate designee will implement the hospital specific response procedures. These procedures may include baseline blood tests on the EMS provider and host patient, interview and counseling of risks to EMS provider, follow-up information and/or referral which may or may not include prophylaxis.

1. The response action will be documented and forwarded to the EMS provider, receiving facility infection control provider, provider's department officer, and the EMS System.
2. Follow-up notification of test results is the responsibility of the receiving hospital infectious disease provider. The EMS System Coordinator will be responsible for follow up to clarify procedure has been accomplished and notification and follow-up have occurred.

E. ALL NEEDLE STICK INJURIES SHOULD BE REPORTED PER YOUR INTERNAL DEPARTMENT POLICY.

IV. **MISCELLANEOUS**

A. Non-latex equipment should be used on all patients with latex allergies.

B. All specimens obtained from a patient should be treated as potentially infectious.

C. It is highly recommended that all EMS providers be vaccinated for Hepatitis B followed by appropriate titer to demonstrate immunity. In some cases, additional series may be warranted.

D. Keep all other recommended vaccinations current and have proper testing as indicated.

E. Include information regarding infection precautions during inbound reports as applicable.

F. PPE is to be disposed of in accordance with appropriate hazardous waste regulations as needed.

1. Soiled clothing and linen should be contained in a Biohazard labeled bag and transported with the patient for disposition.
2. Reusable PPE (i.e. SCBA, protective eyewear) must be cleaned with an appropriate cleaning agent per agency policy.

G. Disposable equipment is to be used in providing patient care when possible. Re-usable equipment (laryngoscope handles/blades, ECG monitors, BP cuffs, cots, ambulances etc.) must be cleaned in accordance with manufacturer and CDC/OSHA guidelines, utilizing an appropriate disinfecting agent after each patient use.

H. Biological materials shall be handled and discarded in a manner that minimizes the potential for human exposure to infectious agents.

I. All surfaces that may have come in contact with the patient or materials contaminated during patient care (e.g. stretcher, rails, control panels, floors, walls, work surfaces) should be thoroughly cleaned and disinfected using an EPA-registered hospital grade disinfectant in accordance with the product label and agency guidelines.

J. Follow agency standard operating procedures for the containment and disposal of used PPE and regulated medical waste.

K. Follow standard operating procedures for containing and laundering used linen. Avoid shaking the linen.

**I. Lifting Precautions**

A. Prevention of injury to EMS personnel and patients is a priority. Proper lifting techniques, having adequate personnel and using appropriate adjuncts such as automatic stretchers and bariatric resources as available are strongly recommended.

# 1.03 COMMUNICATIONS AND INBOUND REPORTS

Overview: Inbound reports are utilized to notify receiving facilities about incoming patients. Information conveyed should be accurate and concise to facilitate the triage/bed assignment process.

I. When communication with online medical direction and/or receiving facility has been established, briefly advise of the following:

- A. Unit Designation and Level of Service
- B. Patient's age
- C. Chief Complaint
- D. Brief History of Present Illness including mechanism of injury (if appropriate)
- E. Summary of symptoms, exam findings (including vital signs) and your impressions
- F. Any medications the patient takes that may impact on the current problem (e.g. Blood thinning medications)
- G. EKG Monitor or 12-Lead interpretations (if applicable)
- H. Treatment rendered
- I. An approximate ETA
- J. Infectious disease considerations as applicable
- K. If requesting orders/interventions, state these first

II. Alert Notification: When the patient's condition warrants, an alert notification (e.g. STEMI, Trauma, Stroke) should be made to the receiving hospital as soon as possible to improve the time to definitive care.

- A. STEMI Alert should be called as soon as feasible when EMS provider identifies a potential STEMI
  1. Transmit the ECG if possible
- B. Stroke Alert should be called when Stroke Screening checklist/GFAST Exam is positive
  1. Provide the patient's last known well time and follow *Suspected Stroke Guidelines*
- C. Trauma Alert should be called when the patient meets applicable Trauma Triage Criteria
- D. Burn Alert should be called when patient injury includes:
  1. Full thickness burn: > 10% of TBSA
  2. Partial thickness burn: > 20% of TBSA
  3. Burns of airway, face, eyes, hands, feet, or genital area
  4. Chemical inhalation causing respiratory compromise, or electrical burn
- E. Unstable Pediatric Alert should be called for pediatric patients with:
  1. Altered LOC
  2. Airway difficulties
  3. Signs of hypoperfusion (shock), *see Hypovolemia & Shock Guideline*
- F. Sepsis Alert should be called when the sepsis screening tool is positive, see *Hypovolemia & Shock Guideline*

# 1.04 TRANSFER OF PATIENT CARE

**Overview:** These guidelines delineate proper transfer of responsibility and patient care from providers of one prehospital agency to an advanced level EMS provider, another prehospital agency, or a healthcare facility.

I. **Information Needed:**
   A. Level of care patient is currently receiving (BLS/ALS).
   B. Level of care to which patient is being transferred.

II. **Emergency Department:**
   A. When a patient is transported to an emergency department, the transporting crew shall not leave the patient unattended in the department.
   B. Written or verbal acceptance of responsibility for the patient should be obtained.
   C. All patients must be turned over to a non-physician provider, registered nurse, or physician.
   D. If there is a delay in transferring patient care and the patient requires further care (i.e. pain management) contact online medical direction.

III. **Other Hospital Departments or Medical Facilities (e.g. Nursing Homes):**
   A. When a patient is transported to a location in a hospital, other than the emergency department, or to a nursing home or other health care facility, the ambulance crew shall remain with the patient until a registered nurse, physician or appropriate healthcare provider accepts responsibility for the patient.
   B. Written or verbal acceptance of responsibility for the patient should be obtained.
   C. An ALS patient must be turned over to a registered nurse or physician.
   D. Care of a BLS patient may be turned over to an appropriate healthcare provider.

IV. **Transfer of patient care to another prehospital care provider (in a situation other than a disaster or triage situation):**
   A. When the care of a patient is going to be transferred to another prehospital care provider, the original crew shall remain with the patient until the next care provider arrives and accepts responsibility for the care of the patient.
   B. All prehospital providers present should be agreeable and comfortable with the transfer of care, including the appropriateness based on current and reasonably anticipated patient care needs.
   C. Written or verbal acceptance of responsibility for the patient should be obtained.
   D. Transfer of patient care responsibility to a prehospital provider of a lower credentialing level must only occur in accordance with the provisions established as per the *Advanced Level Provider Response Guidelines*.

V. **Interfacility Transfers:**
   A. If a patient is receiving medications or is connected to medical equipment, and these medications and/or equipment are not within the scope of practice for the EMS personnel, a nurse, physician or appropriate healthcare provider must be present on the transfer. A provider is prohibited from transferring such a patient without a nurse, physician or appropriate healthcare provider present during transfer. Please see the Tier I-III interfacility transfer and critical care transport guidelines.

# 1.05 Law Enforcement Scene Management

The first and foremost duty of law enforcement and EMS personnel is to protect and preserve human life. To the extent possible, without compromising care, patient care should be given with consideration to the needs of law enforcement with respect to personnel safety, crime scene management and preservation of evidence. Prehospital personnel shall follow the direction of law enforcement with respect to crime scene management. This direction should not prevent nor detract from quality patient care. The following guidelines should be followed:

In all cases where a potential crime, suicide or self-harm, or death has occurred:

I. If police are not already on scene, request their services.
II. Assess the scene to determine if conditions permit safe performance of professional medical duties.
III. If the safety of EMS personnel would be placed in jeopardy, assessment, treatment, and transport may be delayed pending law enforcement intervention.
IV. Park EMS vehicles with consideration of the crime scene at direction of law enforcement if possible.
V. Do not destroy evidence such as tire tracks, footprints, or broken glass.
VI. Consider wearing gloves for all activities at a crime scene including those not directly involved with patient care.
VII. Entry to the crime scene should be made with the minimum number of personnel necessary to access and provide care to the patient(s).
VIII. Entry to and exit from the crime scene should be accomplished by the same route.
IX. Do not walk through fluids (blood) on the floor/ground.
X. Care should be taken not to disturb any physical evidence (including weapons). Do not move or touch anything unless it is necessary for patient care.
XI. Observe and document any items moved.
XII. Notify law enforcement of, and document, any items removed from the scene (impaled object, bottles, and patient belongings).
XIII. Removal of patient clothing should be kept to a minimum. Clothing removal should be done in a manner which will minimize the loss of physical evidence.
XIV. Do not cut through suspected bullet or knife holes.
XV. Clothing and all personal articles of the patient are to be left in the possession of law enforcement personnel whenever possible.
XVI. If resuscitation was attempted, all EKG electrodes, defibrillation pads, IVs, IOs, invasive catheters (e.g. chest needles), and advanced airway devices should be left in place.
XVII. Put wrappers and other disposable “trash”, which accumulates as patient care is rendered, in a single site away from the patient and/or potential crime scene evidence. Do not pick up on-scene trash items and discard them because evidence may be destroyed. On-scene law enforcement personnel may suggest a site to be used for trash which would be ideal to maximize preservation of evidence.
XVIII. Do not clean or disturb a patient’s hands when involved with a firearm.
XIX. Patients who meet the criteria for withholding resuscitative efforts should be assessed using the minimum number of EMS personnel. EKG confirmation of asystole should be completed with minimal movement of the body.
XX. Medical direction should be contacted if a coroner, medical examiner, licensed physician, or hospice RN (if the patient is enrolled in hospice at the time of death) intend to pronounce death on scene with EMS

personnel present. EMS in conjunction with Online Medical Direction Physician will determine if resuscitation should be withheld when EMS is present.

XXI. If obvious death has been presumed by a law enforcement officer, and EMS is present, it is recommended that EMS be involved in the presumption of death. It is important to document the name and badge number of the officer presuming death or limiting access to the scene for patient assessment as the liability for such a decision will rest with him/her, and his/her department.

XXII. Every effort to cooperate with law enforcement should be made. In the event of a disagreement with law enforcement, EMS personnel should document the problem and refer the matter to their supervisor/officer. If the disagreement involves, in the opinion of the prehospital provider, an issue that will or could result in patient harm, an immediate request for on scene EMS and law enforcement supervisory personnel should be made, including consideration for online or in-person medical direction.

XXIII. If EMS personnel discover a potential crime scene, or are at a crime scene without law enforcement, an immediate request for law enforcement shall be made. Until such time as law enforcement arrives, EMS personnel shall ensure their own safety and if possible attempt to follow the guidelines contained in this document.

XXIV. Laundering of the scene is not routinely in the scope or responsibility for the EMS personnel and therefore these requests should be referred to the appropriate resources.

XXV. Patients under police custody or who are under arrest must always have a law enforcement officer available during EMS transport.

**XXVI. Sexual Assault**

A. When possible and operationally feasible, transport all victims of a sexual assault to an appropriate adult or pediatric Sexual Assault treatment hospital.

B. EMS providers who respond to a call for an alleged sexual assault victim should do a medical screening exam to determine whether there is any physical trauma that needs immediate attention. Treat per medical guidelines. The EMS personnel should examine the genitalia only if severe injury is present or suspected.

C. Patient history should be limited to the elements needed to provide emergency care.

D. Be cognizant of preserving evidence during the process of patient assessment and care:

1. Cover cot with paper chux or sterile burn sheet if possible.
2. Handle patient clothing as little as possible.
3. Do not clean wounds unless necessary.
4. Ask the patient not to drink or brush teeth.
5. Ask the patient to avoid bathing, urinating, defecating, or douching if possible.
6. Ask the patient not to change clothes or bathe.

# 1.06 RESPONDER REHABILITATION

These guidelines were developed using NFPA 1584 and FEMA/USFA recommendations. Each agency is encouraged to add their own expertise regarding on scene and response operations in order to develop a full and working document for their respective agency. See reference forms: *Rehab Tracking Form*

Determining Need for Rehabilitation on Scene:

Each incident is unique, and the Incident Commander must assess whether there may be a need for on scene rehabilitation of responders. Rehabilitation shall commence whenever the physical or mental demands of an incident operation or training exercise pose a potential safety or health risk to members as determined by the incident commander (IC). Weather conditions are important with regards to environmental safety. The heat stress index should be calculated in warm conditions, and the wind chill index in cold conditions, see reference tables at the end of this section. As humidity and wind play important factors in cooling, it is not sufficient to make rehab deployment decisions based on temperature alone. When heat, high humidity, or cold exposure is likely on scene, rehabilitation shall generally be initiated as soon as possible with regards to onset of the incident.

Indications for immediate rehabilitation at a working fire scene:

- Heat stress index greater than 89 degrees if turnout gear or protective equipment is utilized and exertion is anticipated
- Any heat stress index over 105
- Wind chill under 10 degrees or actual temperature below zero degrees

Goals for rehabilitation efforts:

- Relief from climatic conditions.
- Rest and recovery.
- Active and/or passive cooling or warming as needed for incident type and climate conditions.
- Rehydration (fluid replacement, calorie and electrolyte replacement for longer duration incidents).
- Medical assessment and treatment when indicated as below.
- Member accountability.
- Member disposition from rehabilitation (reassignment, EMS evaluation, or post-incident recovery).

Crew Guidelines for Rehabilitation:

- Once the Incident Command determines that scene rehabilitation is warranted and is operational, it is mandatory that all personnel on scene follow rehab guidelines.
- If at any time, a crewmember feels the need for rehab it should be provided as soon as possible.
- Crews should be sent to rehab based on work capability and fatigue, not only when their air tank is empty.
- Crews shall advise their officer when they believe their level of fatigue or exposure to heat or cold is approaching a level that could negatively affect them, their crew, or the operation.
- Crews shall remain aware of the health and safety of other members of their crew.
- Personnel are recommended to undergo rehabilitation following the use of a self-contained breathing apparatus (SCBA) or after 40 minutes of extreme work without SCBA (dependent on nature of work, working environment, and climate conditions). Ballistic and Chemical protective apparel is an extreme operation and frequent rehab is also needed in these conditions.

Rehab Unit Configuration Guidelines

- Distance from working scene should be sufficient to allow turnout gear, SCBA or other potentially soiled equipment to be removed.
- Decontamination strategies should be utilized prior to personnel entering rehab area.
- Appropriate shelter from conditions should be provided including heating and cooling as needed.
- Area must be free of smoke and apparatus exhaust.
- A clear entry and exit site should be established.
- Easy and clear access for emergency ambulances must exist.
- Rehab area should be staffed with dedicated medical personnel.
- The Rehab Manager must have final say as to disposition of individuals in the unit.
- A rehabilitation documentation report may be created and include the following information:
    - Unit number
    - Member name
    - Time-in/time-out for members/crews entering or leaving the rehabilitation area
    - If the member is referred for medical evaluation
    - Rehabilitation disposition

ON SCENE MEDICAL SUPPORT

- EMS providers assigned to the rehab group shall have the authority, as delegated by the incident commander, to use their professional judgement to keep personnel in rehab or to recommend transport for further evaluation and/or treatment.
- EMS personnel shall evaluate members with symptoms suggestive of a health and/or safety concern:
    - Chest pain, dizziness, shortness of breath, weakness, nausea, or headache
    - General complaints, such as cramps, aches, and pains
    - Symptoms of heat- or cold-related stress
    - Changes in gait, balance, coordination, speech, or behavior
    - Changes in alertness or orientation to person, place, and time of members
    - This minimum list of sign/symptoms shall not replace the good judgement, experience, and training of EMS providers assigned to rehab
- Assessment - It is recommended that personnel rest for a minimum of 20 minutes. Additionally, personnel in the rehab area will be assessed for physical stress utilizing the following parameters:
    - Blood Pressure
    - Pulse
    - Respiratory Rate
    - Temperature: obtain if symptomatic
    - Pulse Oximetry
- Transport to medical facility for any of the following:
    - Oral temperature greater than 102°F (38.9°C)
    - Oral temperature greater than 101°F (38.3°C) if other symptoms present
    - Resting pulse greater than 120 BPM or irregular
    - Systolic BP > 200 mmHg after rehab
    - Diastolic pressure > 130 mmHg anytime
    - Any dyspnea or hypoxia
    - Any mental status change
- Personnel may return to the incident if appropriate rehydration has occurred, and the following vital sign criteria are met:

- Heart rate <100 BPM
- Systolic BP between 100 mmHg and 160 mmHg
- Diastolic BP <90 mmHg

ON SCENE TREATMENT CONSIDERATIONS

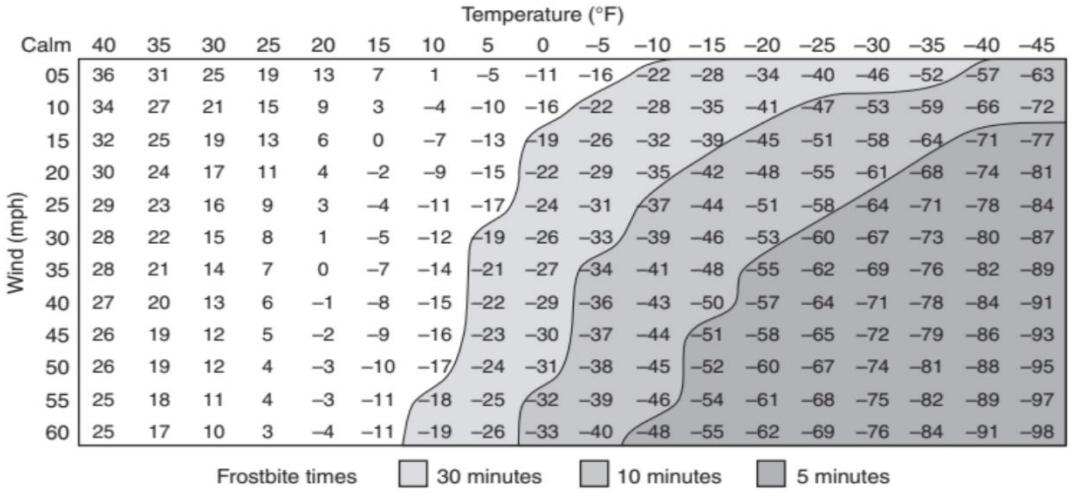
- If body temperature elevated and any neurologic Symptoms treat per *Heat emergencies* consider IV Fluids, cold water immersion, and transport to the hospital.
- If body temperature low, treat per *Hypothermia and Frostbite*
- Consider transportation to Hospital by EMS if the patient shows signs or symptoms of:
  - Persistent abnormal vital signs despite adequate rehabilitation times
  - Chest pain
  - Injuries requiring treatment
  - Persistent headache, abdominal pain, dizziness, blurred vision, mental status changes, gait instability, nausea, vomiting, or general illness
  - Any concerning clinical situation of concern to the rehab/medical officer
  - Anyone requiring IV fluids is recommended to be transported to hospital
- Symptomatic members shall be treated and transported in accordance with EMS guidelines.
- Refusal of Care or Transport to the Hospital:
  - If the department member refuses medical care or transportation, they will be required to sign a medical release waiver
  - The Incident Commander on scene should be made immediately aware of this situation
  - The department member should be encouraged to seek medical care
  - Medical direction can be consulted immediately for any health concerns
- Oral fluid replacement should be partially water and partially a commercially made sports drink (ideal mix 50/50) for electrolyte replacement.
  - Fluids should be on ice, so they have a temperature close to 40 degrees in warm environments
  - Members entering rehabilitation shall consume fluids, regardless of thirst, during rehabilitation and be encouraged to continue hydrating after the incident
  - Members shall avoid over hydration, which can lead to hyponatremia
- Departments shall ensure that appropriate calorie and electrolyte replacements are available as indicated.
- When emergency medical care is provided, the incident commander or designee shall be notified.

RELEASE FROM REHAB

- The rehabilitation manager or their designee shall determine when a member or company can be as follows:
  - Cleared for further incident assignment or demobilization
  - Maintained in rehabilitation for further rest and recovery
  - Transported for more definitive medical evaluation/treatment
- Members being released from rehabilitation shall confirm their accountability with the rehabilitation manager.
- The member shall not return to operations in the following conditions:
  - If the member does not feel adequately recovered
  - If EMS or supervisory staff identifies evidence of medical, psychological, or emotional distress
  - If the member appears otherwise unable to perform his or her duties

POST INCIDENT RECOVERY

- Personnel and crews released from the incident shall follow a demobilization process including the following:
    - Communication of post-incident status
    - Time for post-incident personal hygiene
    - A plan for station, apparatus, protective clothing, and equipment decontamination
    - Identification of potentially traumatic events
    - Completion of exposure reporting as indicated




| Relative Humidity (Percent) | Air Temperature (°F) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 |
| | Apparent Temperature (°F) | | | | | | | | | | |
| 0 | 64 | 69 | 73 | 78 | 83 | 87 | 91 | 95 | 99 | 103 | 107 |
| 10 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 111 | 116 |
| 20 | 66 | 72 | 77 | 82 | 87 | 93 | 99 | 105 | 112 | 120 | 130 |
| 30 | 67 | 73 | 78 | 84 | 90 | 96 | 104 | 113 | 123 | 135 | 148 |
| 40 | 68 | 74 | 79 | 86 | 93 | 101 | 110 | 123 | 137 | 151 | |
| 50 | 69 | 75 | 81 | 88 | 96 | 107 | 120 | 135 | 150 | | |
| 60 | 70 | 76 | 82 | 90 | 100 | 114 | 132 | 149 | | | |
| 70 | 70 | 77 | 85 | 93 | 106 | 124 | 144 | | | | |
| 80 | 71 | 78 | 86 | 97 | 113 | 136 | 157 | | | | |
| 90 | 71 | 79 | 88 | 102 | 122 | 150 | 170 | | | | |
| 100 | 72 | 80 | 91 | 108 | 133 | 166 | | | | | |

| Apparent Temperature (°F) | Danger Category | Injury Threat |
|---|---|---|
| Below 80 | None | Little or no danger under normal circumstances |
| 80–90 | Caution | Fatigue possible if exposure is prolonged and there is physical activity |
| 91–105 | Extreme Caution | Heat cramps and heat exhaustion possible if exposure is prolonged and there is physical activity |
| 106–130 | Danger | Heat cramps or exhaustion likely and heatstroke possible if exposure is prolonged and there is physical activity |
| Above 130 | Extreme Danger | Heatstroke imminent! |

# 1.07 Use of Lights and Siren

Purpose:

For EMS, the purpose of using lights and sirens is to improve patient outcomes by decreasing the time to care at the scene or to arrival at a hospital; however, only a small number of medical emergencies involve time sensitive conditions in which patients may benefit from lights and siren use. Driving with due regard for public safety is critical and always an expected practice for agencies under our medical direction.

Process:

- The use of lights and sirens should be reduced as much as possible and reserved for emergency response and/or emergency transportation. Additionally, training and procedures need to be in place, so when this mode of operation is used it will be done as safely as possible to all drivers and the public.
- After assessing the patient, providers have the ability to downgrade the response to a non-emergent, no lights and sirens response.

Each organization should:

- Develop and regularly review an emergent driving policy that provides for and enforces safe emergency driving practices. This policy should include a system to monitor the use of lights and siren and this use should be reviewed regularly by agency leaders and providers to maximize safe response and transport.
- Provide structured, emergent vehicle operation training and observation prior to allowing personnel to drive the emergency vehicle.

# 1.08 Advanced Level Provider Response

An advanced level provider response should be requested as soon as possible to ensure the patient receives the maximum benefit from the higher-level provider. Agencies must work with their dispatch centers to ensure calls with immediate life threats that would benefit from advanced level intercepts have this response initiated from dispatch. These call types at a minimum include:

I. Cardiac arrest with CPR indicated
II. Trauma with altered mental status
III. Trauma with severe hemorrhage
IV. Penetrating trauma to head, neck, or torso

The following types of calls may also benefit from rapid advanced level response based on EMD, law enforcement or agency request:

I. Cardiac arrest
II. Airway compromise
III. Unresponsiveness
IV. Suspected Acute Coronary Syndrome or STEMI
V. Difficulty breathing despite basic interventions
VI. Anaphylaxis
VII. Severe pain
VIII. Major burns
IX. Major trauma
X. Drowning or near drowning
XI. Substance overdose or toxicity
XII. Severe hypothermia
XIII. Multiple or ongoing seizures
XIV. Complications of pregnancy
XV. Symptomatic abnormal vital signs (significant hyper/hypotension, brady/tachycardia)

If transport time is less than the time anticipated to complete advanced level intercept and interventions, initiate lower-level transport.

Once dispatched, the advanced level agency should initiate contact with requesting agency and give an Estimated Time of Arrival (ETA) if requested. Additional communications should occur to give patient updates, arrange an intercept location and routes of travel as appropriate. Direct radio communications may not perform well when using portable radios and sometimes with mobile radios. Utilization of telephones, repeated channels, MARC, IREACH, STARCOM21, WISCOM, or dispatcher relay are all valid options, and the most appropriate and reliable means of communications should be used.

If need for advanced care is unclear, it would be prudent to request a response from the advanced response while further patient assessment is accomplished. If after a thorough assessment, it is determined that advanced level response is not needed or will delay patient care, then the response can be canceled. Agencies are encouraged to utilize the responding advanced level crew or medical direction to assist with these response decisions. All downgrades/cancellations shall be documented and may be reviewed by the medical director. Cancellation of EMD or Law Enforcement activated advanced level response should only be made after an on-scene assessment of the patient by an EMS provider.

In a non-triage situation, once an advanced level provider establishes care with the patient, they are primarily responsible for the care of the patient. In some cases, it may be appropriate to transfer patient care responsibility and transport to a lower level provider. If, after an appropriate assessment has been performed, the advanced level provider determines that the patient is stable, no interventions outside the scope of practice of the receiving provider have been performed, and all patient care needs can be appropriately managed by a lower level crew, then patient care may be downgraded to another provider in accordance with *Transfer of Patient Care Responsibility Guidelines* and *On-Scene Health Care Provider Guidelines* (NOTE: Paramedic interpretation of a 12-lead EKG does not alone prohibit downgrade of patient care). The advanced level provider is still required to complete a full patient care report that shall include their history and examination, any treatments provided, and the medical decision-making elements for the transfer of care.

In a non-triage situation, if a procedure, skill, or medication is performed that is outside the scope of the lower level provider, the higher level provider should maintain primary care of the patient throughout transport.

Process:

I. Upon request by a lower level ambulance for assistance, a higher level crew may board the lower level ambulance and begin care of the patient.
II. The higher level equipment must be transferred to the lower level ambulance to render a higher level of care.
III. The higher-level provider will assume responsibility from the EMTs for the care and treatment of the patient.
IV. EMTs should assist the ILS/ALS provider en route and on the scene and work together as a team to provide the best patient care possible.
V. The lower level ambulance will be approved to function as a higher-level ambulance for the transport.
VI. Separate patient care reports must be completed by the lower level ambulance (for care initiated prior to higher level arrival) and the higher level provider.

# 1.09 HEMS GUIDELINES

Helicopter Emergency Medical Services (HEMS) utilization is a medical decision requiring appropriate oversight and should be integrated within regional systems of care. HEMS may provide a time savings benefit to patients with time-sensitive emergencies[i] in reaching hospitals that can provide interventions **IF** the patient can be delivered during an interventional window[ii] **AND** Ground Emergency Medical Services (GEMS) are not able to appropriately deliver the patient to definitive care within that interventional window.

I. HEMS may provide clinical resources to patients needing critical care services if unable to obtain critical care services by GEMS (e.g. interfacility transfer).
II. HEMS may provide a mode of transport for geographically isolated, remote patients independent of medical urgency (e.g. on an island) although this mode should be carefully considered.
III. HEMS may provide a resource to local GEMS systems during disasters and times of limited community resources.
IV. Hospital destination and mode of transport are two separate and distinct clinical issues.
V. Mode of transport decisions pose unique challenges in developing evidence-based transport guidelines.

[i]A time-sensitive emergency can be defined as an acute life-threatening medical or traumatic event that requires a time critical intervention to reduce mortality and/or morbidity. Examples include major systems trauma, ST elevation myocardial infarction, or some strokes.

[ii]An interventional window can be defined as the period of time during which mortality or morbidity is likely to be reduced by the administration of pharmaceutical agents, medical procedures or interventions. An interventional window should be based on available national consensus guidelines such as the American Heart Association's first medical contact or door to balloon time. The "Golden Hour" of trauma refers to the core principle of rapid intervention in trauma cases, rather than the narrow meaning of a critical one-hour time period. There is no evidence to suggest that survival rates routinely drop off after 60 minutes.

# 1.10 DESTINATION DETERMINATION

It is the purpose of this document to provide guidelines for determining the appropriate transport destination for every patient. Generally, patients should be transported to the closest, most appropriate hospital, utilizing the most appropriate level of care based on provider assessment of the patient on-scene. Patients should not be transported to a more distant facility unless the medical benefits to the patient reasonably expected from the provision of appropriate medical treatment at a more distant facility outweigh the increased potential risks to the patient from transport to the closer facility.

I. Determination of appropriate hospital should be based on medical benefits and associated risks and should be made in accordance with:
   - A. Patient Request, Preference or Medical Home
   - B. Patient's Medical Condition and Specialty needs of the patients:
     1. Burns (Major)
     2. Pediatric/Neonatal
     3. STEMI/Chest Pain
     4. Stroke
     5. Trauma
        - a) > 25 minutes from Trauma Center, transport to nearest participating trauma hospital.
        - b) > 30 minutes from Trauma Center or participating trauma hospital, transport to nearest hospital
        - c) > 45 minutes from Trauma Center or participating trauma hospital in a rural area where there is no comprehensive emergency department available, transport to the nearest hospital.
     6. Obstetrics/Gynecology
     7. Sexual Assault
     8. Psychiatric/Behavioral
     9. Bariatric Considerations (Including CT capabilities)
     10. Hospitals capabilities to meet patient needs
   - C. Availability of resources of the agency
   - D. Traffic and weather conditions
   - E. Infectious disease considerations
   - F. Online medical direction Order(s)
   - G. Mass Casualty/Disaster Considerations/Resource Limitations
   - H. Other system approved destinations

II. The patient has the right to make the decision on hospital destination if it is operationally available to the EMS service (a hospital the service would normally be allowed to transport to). If patient assessment dictated the patient should be transported by EMS to a differed hospital than their original choice but has the decision-making capacity and requests transport to another facility, attempt to quickly educate the patient regarding the reasons to go to the alternate facility. If applicable document refusal.

*The 2022 National Guideline for the Field Triage of Injured Patients* has been approved and endorsed by Wisconsin DHS, the Statewide Trauma Advisory Council (STAC), and the EMS Advisory Board during the statewide meetings in June 2022. EMS providers should refer to this Guideline (see reference below).

## National Guideline for the Field Triage of Injured Patients

### *RED CRITERIA*

***High Risk for Serious Injury***

| Injury Patterns | Mental Status & Vital Signs |
|---|---|
| • Penetrating injuries to head, neck, torso, and proximal extremities<br>• Skull deformity, suspected skull fracture<br>• Suspected spinal injury with new motor or sensory loss<br>• Chest wall instability, deformity, or suspected flail chest<br>• Suspected pelvic fracture<br>• Suspected fracture of two or more proximal long bones<br>• Crushed, degloved, mangled, or pulseless extremity<br>• Amputation proximal to wrist or ankle<br>• Active bleeding requiring a tourniquet or wound packing with continuous pressure | All Patients<br>• Unable to follow commands (motor GCS < 6)<br>• RR < 10 or > 29 breaths/min<br>• Respiratory distress or need for respiratory support<br>• Room-air pulse oximetry < 90%<br><br>Age 0–9 years<br>• SBP < 70mm Hg + (2 x age in years)<br><br>Age 10–64 years<br>• SBP < 90 mmHg or<br>• HR > SBP<br><br>Age ≥ 65 years<br>• SBP < 110 mmHg or<br>• HR > SBP |

Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system

### *YELLOW CRITERIA*

***Moderate Risk for Serious Injury***

| Mechanism of Injury | EMS Judgment |
|---|---|
| • High-Risk Auto Crash<br>– Partial or complete ejection<br>– Significant intrusion (including roof)<br>• >12 inches occupant site OR<br>• >18 inches any site OR<br>• Need for extrication for entrapped patient<br>– Death in passenger compartment<br>– Child (age 0–9 years) unrestrained or in unsecured child safety seat<br>– Vehicle telemetry data consistent with severe injury<br>• Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.)<br>• Pedestrian/bicycle rider thrown, run over, or with significant impact<br>• Fall from height > 10 feet (all ages) | Consider risk factors, including:<br>• Low-level falls in young children (age ≤ 5 years) or older adults (age ≥ 65 years) with significant head impact<br>• Anticoagulant use<br>• Suspicion of child abuse<br>• Special, high-resource healthcare needs<br>• Pregnancy > 20 weeks<br>• Burns in conjunction with trauma<br>• Children should be triaged preferentially to pediatric capable centers<br><br>If concerned, take to a trauma center |

Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center)

# 1.11 CONSENT/REFUSAL OF MEDICAL CARE

I. **Purpose:** To be utilized when a person with an actual or potential injury or medical problem is encountered by EMS personnel and wishes to refuse indicated care or transport.

II. **Definitions:**

A. **Decision-making capacity (or decisional capacity):** The ability to understand and appreciate the nature and consequences of a decision regarding medical treatment and the ability to reach and communicate an informed decision.

1. **Tests of decisional capacity:** Whether a patient understands and appreciates their condition, the nature of the medical advice given, and the consequences of refusing to consent. This generally can be determined by a combination of the following assessments:
   a) **Alertness and orientation**: Person, place, time, and situation?
   b) **Affect**: Is the patient's behavior consistent with the environmental stimuli?
   c) **Behavior**: Is the patient acting in a controlled manner? Body language, agitation, hyperactive, inattentive, repetitive movements?
   d) **Cognition/judgment:** Does the person understand and appreciate the relative information?
      (1) Can they draw reasonable conclusions based on facts?
      (2) Is the patient able to make rational decisions with respect to their need for treatment?
   e) **Communication:** Patients should be able to communicate a clear choice. This should remain stable over time. Inability to communicate a choice or inability to express the choice consistently may demonstrate lack of Decisional Capacity.
      (1) Is the patient speaking in full sentences with clear speech and normal speech tempo?
   f) **Decision insight:** Can the patient appreciate the implications of the situation and the consequences of their decision?
      (1) Is the patient able to recognize obvious danger of their situation (if applicable)?
2. For patient situations in which the patient's decisional capacity, ability to consent or threat to self or others is uncertain and, by extension, their right to refuse treatment/transport is unclear, the EMS provider should contact online medical direction.

B. **Intoxicated person:** a person whose mental or physical functioning is substantially impaired due to the current effects of alcohol and/or other drugs/mind-altering substances within the body. Patients who are intoxicated as above typically lack decision-making capacity.

1. Note that the presence of alcohol or drugs in a person's system does not automatically dictate a conclusion that the patient lacks decisional capacity.
2. The patient should be assessed for clinical capacity as above.

C. **Abandonment** occurs when the provider-patient relationship, once it has been established, is intentionally and inappropriately ended by the EMS provider. As it pertains to EMS providers, the acceptable manners in which a provider-patient relationship may end include:

1. The patient with decisional capacity ends the relationship,
2. The patient's care is transferred to another qualified medical professional (See *Advance Level Provider Response* for information on downgrading),
3. The continuation of the provider-patient relationship constitutes a danger to the provider's safety
4. Patient has been dispositioned with medical direction involvement
   a) Whenever a perceived conflict exists between the EMS provider's safety and their obligation to render aid, the safety and well-being of the EMS provider must always take precedence.

b) The EMS provider does not have a legal duty to act if doing so could put them in harm's way.
c) Consult online medical direction during situations in which EMS providers are unable to access patient or provide care due to unsafe circumstances.

D. **Consent:** A decisional adult's agreement to be treated. Consent may be via verbal agreement to the treatment, gestures indicating their desire for treatment or via implied consent.
1. Consent or refusal for treatment/transport should be **"informed"** by providing the information and explanation of treatment described in D(2) and (3) below.
2. EMS personnel should clearly explain the proposed treatment(s) and/or recommendations for transport to the patient and, when appropriate, the family or guardian.
3. The explanation shall include a disclosure of **risk.**
   a) Nature of potential the illness/injury
   b) Nature, purpose, and need for the recommended examination/care
   c) Potential **benefits** and possible risks and complications of recommended treatment; plus, possible results of non-treatment
   d) Any pertinent **alternative** options if they refuse recommended treatment.

E. **Implied consent:** Consent that is assumed by the reasonable belief that if the patient was able to provide consent, they would do so freely. Patients who are **incapacitated**, cannot provide informed consent to treatment, and do not exhibit the ability to make sound judgments, will be treated under the doctrine of implied consent.

F. **Adult**: In Wisconsin, a person who is 18 years of age and out of high school.

G. **Minor:** In Wisconsin, any person under the age of 18 is a minor, but is legally emancipated if the person:
1. Is married (requires parental consent at age 16-17)
2. Is a member of the U.S. Armed Services
3. Has obtained a court order of emancipation
4. Note: Parental or guardian consent is not required for patients over the age of twelve (12) seeking treatment for mental health, sexually transmitted diseases, sexual abuse/assault, alcohol, or drug abuse.
5. Pregnant minors seeking abortions *usually* need parental consent to have the procedure done. However, in cases where the minor is pregnant by a relative, legal guardian, household member or foster parent; became pregnant through an act of sexual assault; is facing a medical emergency; or is likely facing a suicide attempt, parental consent for an abortion is not required.
6. Certain rights and privileges remain off limits until the emancipated minor reaches the age at which those rights are normally conferred. These rights and privileges include:
   a) The right to vote (18).
   b) The right to buy and consume alcoholic beverages (21).
   c) The right to buy and possess a gun (18).
   d) The privilege of holding a nonrestricted driver's license (16).
   e) The ability to consent to sexual intercourse with an adult to whom she is not married (18, unless both parties are 16-17).

## III. Refusal Procedure: Patient with Decision-Making Capacity

A. All patients should be offered treatment up to and including transport to the closest appropriate hospital, as applicable, after an attempt to obtain a history of present illness and physical exam has been made and permitted by the patient.

B. **Determine** Decision-Making Capacity of the patient and the reason for refusing/declining treatment/transportation. **Document** your assessment and the reason for refusal/declination of treatment/transport if a reason is given.
1. **Inform** the patient of the **risks** associated with refusal including the possibility of deterioration of medical condition up to and including death (if applicable), **benefits of**

**treatment/transportation** and **alternative** of decisions as well as the patient's understanding. Providers have the responsibility to provide informed consent for the refusal

2. Inform the patient that EMS evaluation and/or treatment is not a substitute for medical evaluation and treatment by a physician.
3. If patient's condition was discussed with medical direction, inform them that this also does not substitute for medical evaluation.

C. Complete and review the approved system refusal documentation in its entirety with the patient in the presence of a witness.
1. Patients should have vital signs obtained, unless refused.
    a) Patients should be informed when vital signs are abnormal.
    b) Refusal of vital signs should be documented.
2. Obtain patient signature and have the patient date the form.
3. If the patient refuses to sign the refusal form, document this on the patient care report.

D. Inform the patient to call 911, their primary care provider or present to the nearest Emergency Department if symptoms persist, change or if the patient changes their mind regarding refusal of care.

E. Obtain a witness signature. This should preferably from someone who witnessed your explanation of risks, benefits, and alternatives of transport/treatment. Witnesses should sign in the following order of preference.
    a) Police Officer
    b) Family Member
    c) Crew Member

F. **NEVER ADVISE AGAINST SEEKING MEDICAL ATTENTION!**

G. Consider discussion with online medical direction for high-risk situations including:
1. Questionable decision-making capacity or ability to consent.
2. Potential **high-risk situations** such as:
    a) Extremes of age (infants/elderly).
    b) Minor who is refusing care.
    c) Serious chief complaint (including, but not limited to chest pain/dysrhythmia, shortness of breath, BRUE, stroke-like symptoms, syncope, first time seizures, poison/overdose, suspected sepsis, suspected cervical spine injury).
    d) Significant Mechanism of Injury (MOI) or suspicion of injury.
    e) You believe a patient requires evaluation.
    f) Conflict on scene regarding refusal of care.
    g) Suspected abuse situation involving a minor, elderly, or a person with a disability.
    h) Any altered mental or neurological status (individual or parent/guardian for a minor).
    i) Abnormal vital signs.
    j) Patient assessment dictates that the patient should be transported by EMS to a different hospital than their original choice.

H. With any medical need, make all reasonable efforts to ensure that the patient receives medical care. Enlist family, friends, or law enforcement to help convince patient.

I. Complete a patient care report.

IV. **Patients without Decision-Making Capacity: A patient without decision-making capacity lacks the ability to consent to or refuse treatment**

A. Determine decision-making capacity of the patient as above.

B. If the patient is deemed non-decisional and/or is deemed to be a danger to self or others, prehospital providers should carry out treatment and transport in the interest of the patient's welfare and be treated under the doctrine of implied consent.

C. Patients lacking decision-making capacity are unable to complete a refusal form.

D. Attempt to determine whether the patient's decisional capacity is impaired due to a medical condition such as hypoglycemia, hypoxia, hypoglycemia, delirium, dementia, mental illness, trauma, stroke, or the presence of alcohol or other mind-altering substances. (See *Altered Level of Consciousness* ). If the patient's lack of decisional capacity is determined to be the result mental illness, see *Behavioral Emergencies, Involuntary Petition*

1. Those medical conditions above alone do not dictate a conclusion that the patient lacks decisional capacity. The patient must be assessed to determine whether he or she has the clinical capacity to make decisions.

E. EMS providers should be constantly mindful of their safety and should always avoid unnecessary danger.

F. Treat medical condition per appropriate medical guidelines.

1. Any treatments/interventions which may ordinarily be suggested by the SMGs can be waived if their attempted performance could reasonably be expected to compromise the cooperation of a patient who is otherwise agreeable to being transported or may reasonably be expected to cause an escalation of a patient such that patient and/or crew safety becomes endangered.
2. The EMS provider should describe their consideration of any withheld treatment/intervention which would have otherwise been indicated, as well as their rationale for withholding the treatment/intervention, in the Prehospital Care Report (PCR).

G. Examples of patients generally lacking decision-making capacity:

1. The patient has altered thought processes or judgement from illness, injury, or medical condition.
2. Alcohol, drugs, or other mind-altering substance(s) are substantially impairing the patient's judgement as above. This may be noted with slurred speech, ataxia, etc.
3. Any minor (see below)

H. The EMS provider should make every reasonable effort to gain the patient's consent to be transported and should only initiate measures to treat/transport the patient against their will after all reasonable efforts to gain the patient's consent have been exhausted.

I. If the patient persists in refusing treatment/transport, or if the patient becomes combative, law enforcement involvement and evaluation should be obtained.

J. If, in the opinion of the prehospital provider, the decision of law enforcement or other responder, including a Mobile Crisis response or similar personnel, not to assist EMS accessing, treating, or transporting a patient presents an issue that will or could result in patient harm, immediate request for on-scene EMS and law enforcement supervisory personnel should be made. In these situations, medical direction must be contacted.

K. At no time should EMS providers place themselves in an unsafe situation per their assessment. If EMS is unable to obtain law enforcement assistance to safely facilitate transport of a patient contact medical direction and this information should be documented.

1. If the EMS provider cannot safely gain access to a patient, after exhausting all efforts at persuasion and EMS Provider to believe that attempting to transport such a patient would constitute a threat to their safety, and law enforcement is unwilling or unavailable to provide assistance the EMS provider may declare that the scene is "not safe" Contact medical direction and provide as much detail as possible (armed, barricaded, etc.).
2. Medical direction may not necessarily grant a refusal, rather medical direction shall acknowledge the crew's inability to treat/transport the patient due to safety reasons
3. If the scene is secured, EMS should return if needed

L. The application of physical restraints and/or pharmacologic management/sedation when providing EMS care may be required to prevent non-decisional patients from causing harm to themselves or others, to facilitate emergency assessment, or to allow for treatment of life-

threatening injury or illness and should only be considered when all less-restrictive preventative measures have either been exhausted or may reasonably be expected to be ineffective.

1. Do not attempt to access, restrain, care for, or transport an uncooperative patient if you cannot reasonably guarantee your own safety.
2. Physical restraints are to be utilized SOLELY for the purpose of preventing the patient from harming themselves or others, and only during circumstances in which the threat of harm posed by the patient is clear and immediate. Physical restraints should NEVER be applied to patients with decisional capacity and should NEVER be used for any reason other than the prevention of harm. or in a manner that restricts breathing, circulation, or access for monitoring the patient.
3. See *Agitated, Combative, and Violent Guidelines*

M. When completing patient care report, document the assessment that led to the determination that the patient lacks decision-making capacity as well as the clinical signs and symptoms on which need for transport/treatment was based.

N. Patients who lack decisional capacity should not automatically be assumed to have a mental illness that requires involuntary admission for psychiatric treatment

## V. Minors

A. The consent of a parent or guardian is generally required for refusal or treatment for minors.

B. Minors generally cannot independently refuse care outside of certain emancipated minors, as described above.

1. If indicated, a parent or guardian should complete the approved refusal form.
2. All reasonable attempts should be made to release a minor to a legal guardian. If a legal guardian cannot be located, document your attempts.
   a) Minors may be released to law enforcement or juvenile authority.
   b) A person taking protective custody of a minor must immediately make every reasonable effort to notify the person responsible for the child's welfare and notify the Department of Children and Family Services.
   c) Minors may be released to another adult if guardian is contacted by phone and consent for release is given. Document phone call, name of guardian, and witness. Contact medical direction in these situations if indicated.

C. If a parent or guardian is not immediately available to consent and, without treatment the minor's health would be adversely affected, EMS personnel should provide appropriate emergency treatment and transport.

D. If a minor is believed to be under the influence of drugs and/or alcohol and a parent/guardian wishes to refuse treatment and/or transport, contact medical direction.

E. If a parent or guardian refuses to consent for treatment without which the minor's health would be endangered contact medical direction.

F. Complete the patient care report.

## VI. Patients in Law Enforcement Custody

A. Persons in law enforcement custody may be considered a patient but do not automatically lose the right to make decisions regarding their medical treatment and should be assessed for **decision-making capacity** as indicated and allowed.

B. Patients in law enforcement custody who have been assessed and have been determined to have decision-making capacity may refuse treatment by EMS per refusal procedure for a patient with decision-making capacity.

1. Patients in law enforcement custody are to be considered by EMS to have the same rights to informed consent as any patient treated by EMS.
   a) They are to receive sufficient information to make informed decisions about their care, including consent for, or refusal of, treatment.

b) The patient should receive verbal instructions regarding his/her care including applicable risk disclosures
c) In these situations, law enforcement should be involved and should also sign the appropriate refusal form.

2. Law enforcement officer may authorize transport of prisoners in custody or detention but cannot dictate EMS treatment decisions.
   a) In these situations, document that law enforcement has taken protective custody of the patient and the patient's refusal of treatment as applicable
   b) If the transported patient is in law enforcement custody, law enforcement shall provide an officer who is immediately available.
3. Law enforcement agents cannot compel EMS personnel to disregard the rights of any person, regardless of whether such person is in police custody.

C. EMS is not equipped or authorized to provide **"Medical Clearance"** prior to transport to jail.

D. If a law enforcement officer denies medical treatment to someone in their custody when treatment appears necessary, EMS personnel should provide the law enforcement officer with full disclosure of risks of potential harm to the patient and attempt to gain their cooperation. If any disagreements occur with law enforcement, contact medical direction, and document the conversation with law enforcement.

E. Persons in law enforcement custody who have been assessed and have been determined to **lack decision-making capacity**:
1. Should be treated per implied consent. Follow appropriate medical guidelines.

F. If law enforcement has determined via breathalyzer that a person has a blood alcohol level above a legal limit, and requests evaluation by EMS, a clinical assessment should occur.
1. Legal intoxication numbers alone do not necessarily correlate with decisional capacity.
2. If a disagreement with Law Enforcement occurs, contact medical direction.

## VII. Multiple Patients/Highway Response

A. In highway responses, mass casualty incidents, or similar, a reasonable/common sense approach should be used. Responder and patient safety must be considered.

B. Potentially dangerous response should be conducted and coordinated with law enforcement to provide maximum safety to EMS responders, patients, victims, and bystanders.

C. Criteria for use of the *Multiple Victim Release Form:*
1. A large number of patients are present, generally > 6, such that the demands of the scene outweigh the local resources, and/or
2. Scene circumstances prohibit EMS personnel from completing the usual documentation (i.e. highway response)

AND

3. **Adult** victims with decision-making capacity who:
   a) Claim no injuries/illness
   b) Who are not obviously injured/ill
   c) Have minimal mechanism for injury/illness
   d) Refuse transport

OR

4. **Pediatric** pt involved in school bus incidents in which medical direction has approved its use.
   a) For school bus incidents, refer to *School Bus Incidents Guidelines*
5. Other situations as authorized by medical direction

D. When utilizing the *Multiple Victim Release Form* 1 EMS run report may be completed, and a copy of the approved Multiple Victim Release Form should be attached to the run report.

# 1.12 BEHAVIORAL EMERGENCIES

I. **Purpose:** The purpose of this document is to provide guidelines when a patient is having a behavioral or mental health emergency. These guidelines are considered complementary to *Consent/Refusal of Medical Care* and should be referenced when referring to these guidelines.

II. **Definitions:**

A. **Mental illness**: a mental or emotional disorder that substantially impairs a person's thought, perception of reality, emotional process, judgment, behavior, or ability to cope with the ordinary demands of life, but does not include a developmental disability, dementia or Alzheimer's disease absent psychosis, a substance use disorder, or an abnormality manifested only by repeated criminal or otherwise antisocial conduct. (405 ILCS 5/1-129)

B. **Statement of Emergency Detention by Law Enforcement Officer ("Emergency Detention")**: Chapter 51 of Wisconsin Statutes refers to alcohol, drug abuse, developmental disabilities, and mental health act (2021). WI Stat § 51.15 refers to the legal basis and document used by law enforcement to request that a person be involuntarily detained, on an emergency basis, to allow treatment for individuals meeting certain criteria.

C. **Applicable Wisconsin Statutes**:

- Wis. Stats. §448.30 – Informed Consent
  - A patient shall be informed about the availability of reasonable medical treatment options and about the benefits and risks of these treatments, except in situations where the patient is incapable of consenting or where failure to provide treatment would be more harmful to the patient than treatment.
- Chapter 51.15 – Emergency Detention
  - In emergency situations when a person manifests a substantial probability of physical harm to himself or herself or to other persons through threats, attempts, or other behavior, or a substantial probability of physical impairment or injury to himself or herself or other individuals due to impaired judgment, or that death, serious physical injury, serious physical debilitation, or serious physical disease will imminently ensue unless the individual receives prompt and adequate treatment for a mental illness.
- Chapter 51.45 – Prevention and Control of Alcoholism and Drug Dependence
  - In emergency situations when a person, as a result of the use of or withdrawal from alcohol or another drug, is unconscious or has his or her judgment otherwise so impaired that he or she is incapable of making a rational decision ("incapacitated"), as evidenced objectively by such indicators as extreme physical debilitation, physical harm or threats of harm to himself or herself or to any other person, or to property.
- Chapter 55.06 – Protective Services and Protective Placement
  - EMS may be asked by a legal body to transport an individual, against their will, who is adjudicated incompetent in Wisconsin or for a minor who is alleged to have a developmental disability, and only if there is a finding of a need for court-ordered protective placement/services.

III. **Guideline Statement and Process**: EMS providers should act in the patient's best interest and consider the mental health needs of a patient who appears emotionally or mentally incapacitated. In these situations, prehospital providers should employ the following guidelines:

A. If the patient poses an immediate threat to the safety of themselves or others, law enforcement shall be notified for assistance

B. Attempt to determine whether the patient's Decisional Capacity is impaired due to a medical condition (See *Capacity*.)
   1. Assess Decision Making *Capacity* and potential for danger to self or others by observation, direct exam and reports from family, bystanders, law enforcement, or verified mental health personnel.

C. Identify yourself and always first attempt to treat and transport the patient with the patient's cooperation
   1. Any treatments/interventions which may ordinarily be suggested by the SMGs can be waived if their attempted performance could reasonably be expected to compromise the cooperation of a patient who is otherwise agreeable to being transported or may reasonably be expected to cause an escalation of a patient such that patient and/or crew safety becomes endangered.
   2. The EMS provider should describe their consideration of any withheld treatment/intervention which would have otherwise been indicated, as well as their rationale for withholding the treatment/intervention, in the PCR

D. If the patient persists in refusing treatment/transport, or if the patient becomes combative, law enforcement involvement and evaluation should be obtained.
   1. EMS providers should be constantly mindful of their safety and should always avoid unnecessary danger.
   2. Law Enforcement may take a person into custody and transport them for treatment when the law enforcement officer has reasonable grounds to believe, based on the Assertion Criteria in Section III above, that the person is subject to involuntary admission on an inpatient basis and in need of immediate hospitalization to protect such person or others from physical harm.
      a) EMS should provide information to law enforcement which would support such a belief whenever they are requesting that law enforcement transport someone involuntarily to a mental health provider.
   3. If, in the opinion of the prehospital provider, the decision of law enforcement or other responder, including a Mobile Mental Health response or similar personnel, not to assist EMS accessing, treating, or transporting a patient presents an issue that will or could result in patient harm, immediate request for on-scene EMS and law enforcement supervisory personnel should be made. In these situations, online medical direction must be contacted.
   4. At no time should EMS providers place themselves in an unsafe situation per their assessment. If EMS is unable to obtain law enforcement assistance to safely facilitate transport of a patient this should be documented and relayed to medical direction from the scene.
      a) If the EMS provider cannot safely gain access to a patient, after exhausting all efforts at persuasion and EMS provider to believe that attempting to transport such a patient would constitute a threat to their safety, and law enforcement is unwilling or unavailable to provide assistance the EMS provider may declare that the scene is "not safe" providing as much detail as possible (armed, barricaded, etc.) to medical direction.
      b) Medical direction may not necessarily grant a refusal, rather medical direction shall acknowledge the crew's inability to treat/transport the patient due to safety reasons
      c) If the scene is secured, EMS should return if needed
   5. The application of physical restraints and/or pharmacologic management/sedation when providing EMS care is required to prevent non-decisional patients from causing harm to themselves or others, to facilitate emergency assessment, or to allow for treatment of life-

threatening injury or illness and should only be considered when all less-restrictive preventative measures have either been exhausted or may reasonably be expected to be ineffective.

a) Do not attempt to access, restrain, care for, or transport an uncooperative patient if you cannot reasonably guarantee your own safety.
b) Physical restraints are to be utilized SOLELY for the purpose of preventing the patient from harming themselves or others, and only during circumstances in which the threat of harm posed by the patient is clear and immediate. Physical restraints should NEVER be applied to patients with decisional capacity and should NEVER be used for any reason other than the prevention of harm. or in a manner that restricts breathing, circulation, or access for monitoring the patient.
c) See *Agitated, Combative, and Violent Guidelines*

6. If it is necessary to treat and/or transport a patient against their will based upon a reasonable belief that the patient is mentally ill or developmentally disabled and inpatient treatment is the only way to prevent the patient from harming themselves or others as a result of their mental illness or developmental disability, a Petition for Involuntary/Judicial Admission (Form 5) should be completed.
7. When completing a patient care report, document the assessment that led to the determination that the patient lacks decision-making capacity (as applicable) as well as the clinical signs and symptoms on which the need for transport/treatment was based.

IV. **Wisconsin EMS Use of an Emergency Detention:**

*Note: Mental illness alone is insufficient to involuntarily detain a person. Rather, a person may require immediate treatment for the prevention of harm as below:*

1. A law enforcement officer will involuntarily detain a person using CH51.15 when they have cause to believe that:
    a. The subject is mentally ill, drug dependent, or developmentally disabled.
    b. The subject evidences behavior which constitutes a substantial probability of physical harm to self or to others, or as otherwise set forth in §51.15(1), Wisconsin Statutes.
    c. Taking the subject into custody is the least restrictive alternative appropriate to the subject's needs.
2. An emergency detention is the first step in a legal process that protects the patient's rights and is necessary before a physician can determine if an involuntary admission is necessary.
3. Prehospital provider should indicate on the EMS Patient Care Report that involuntary transport has been ordered by law enforcement via emergency detention or online medical direction via implied consent.
4. EMS Provider should inform the patient that under no circumstances does transport of the patient, whether voluntarily or against his/her will, commit the patient to a hospital admission. It simply enables the EMS providers to transport a person suspected to be in need of emergency evaluation and treatment.
5. At no time should EMS Providers place themself in an unsafe situation per their assessment. If EMS is unable to obtain law enforcement assistance to safely facilitate transport of a patients this should be documented and relayed to online medical direction.

# 1.13 On-Scene Health Care Provider

**Introduction:**

A physician present on the scene does not automatically supersede the EMS providers authority. Once the EMS provider-patient relationship is established, the written standing medical guidelines through the Mercyhealth EMS System provide the legal basis for EMS providers to function. Occasionally, a physician will be present on the scene of a call, which may cause confusion, uneasiness, and medicolegal considerations.

**Procedure:**

I. EMS personnel should assess and manage the patient upon arrival at the scene regardless of on-scene physician direction. This includes a physician's private office or clinic.

II. Physician must show proof of current state medical license (wallet card if possible). If any doubt of their identity exists, the physician must provide proof of further identity if they wish to assist with patient care.

III. Should the on-scene physician wish to assume responsibility of patient management, the following **must** be satisfied:
   - A. Communication established between online medical direction and the on-scene physician.
   - B. The on-scene physician agrees to accompany the patient in the transporting vehicle to the hospital.

IV. In the event that the on-scene physician agrees to assume responsibility and the above criteria are satisfied, then the following medical/legal details must be adhered to:
   - A. Orders given by the Intervener (on-scene) Physician may be carried out by the EMS crew, if they are part of the provider's level of training. Orders that are not part of the provider's level of training must be done by the Intervener Physician. Do not deviate from your usual scope of practice.
   - B. If the EMT feels uncomfortable about any aspect of patient care in the field, he or she should **contact medical direction** and communicate those concerns. The Online Medical Direction Physician has the authority to supersede any or all the orders given by the intervener physician at any time during the prehospital phase.
   - C. An on-scene physician who elects not to accompany the patient to the hospital will immediately and automatically relinquish control to the Online Medical Direction Physician.
   - D. The Physician must provide license information for the run report and sign the EMS run sheet.
   - E. The Physician must assume complete medical/legal responsibility for all patient care activities until such time care is formally transferred to another physician at the receiving hospital.

**Special Situations:**

I. In the event of a potential multi-patient incident, an on-scene physician may be best utilized at the scene and not accompany a patient to the hospital.

II. If the on-scene physician wishes to terminate resuscitation measures, he or she may do so provided that this action is communicated to and concurred by online medical direction.

III. Orders communicated for patients undergoing interfacility transport should be followed as long as those orders are within the EMTs scope of practice and training. If possible, the transferring physician should sign those orders.

**Non-Physician Medical Personnel on the Scene:**

I. Prehospital providers should recognize and acknowledge the expertise of other medical professionals (RN, LPN, Nurse Practitioner, Respiratory Therapist, Physician Assistant, non-agency EMS provider etc.) and utilize them as needed for the best outcome of the patient.

II. If a bystander at an emergency scene identifies himself or herself as a health care provider other than a physician, the EMS provider should:

   A. Inform the individual that he or she may assist the emergency team and/or offer suggestions but may **not** assume medical management for the patient. These individuals should **not** direct patient care.

   B. An RN or non-agency EMS provider on scene may assist to the level of First Aid. If additional skills are needed (e.g.IV initiation) medical direction should be contacted for permission to utilize this person in an expanded role.

   C. An RN or non-agency EMS provider on scene must provide proof of state licensure and a picture ID. They must agree to follow the directions of the EMSMD or his/her designee.

# 1.14 ADVANCE DIRECTIVES/HOSPICE

The EMS System supports the use of Do-Not Resuscitate (DNR) orders, Practitioner Order for Life-Sustaining Treatment (POLST) forms, advance directives, and other state-approved pre-determined patient care processes to allow patients to express their desire for healthcare professionals to provide or withhold specific treatments. Patient rights regarding these decisions should be respected whenever possible. All persons have a fundamental right to make decisions relating to their own medical treatment, including the right to forgo life-sustaining treatment.

When a patient has an activated DNR, POLST, or other similar type of advance directive that EMS personnel are aware of, the following guidelines should be followed. These guidelines apply to all cardiac arrest/DNR situations, including in long-term care facilities, hospice and home care patients, and patients who arrest during interfacility transfers or transportation to/from home. These guidelines also apply to hospice patients not in cardiac or respiratory arrest.

Always make a reasonable attempt to verify the identity of the patient (for example, identification by another person) named in a valid DNR or POLST advance directive.

**DEFINITIONS**

- **Advance Directive:** A Living Will, Health Care Power of Attorney, IDPH POLST form, or another similar document.
- **Do Not Resuscitate (DNR) Order:** an authorized practitioner order that reflects an individual's wishes about receiving cardiopulmonary resuscitation CPR; electrical therapy to include pacing, cardioversion and defibrillation; invasive airway management and manually or mechanically assisted ventilations
- **Health Care Power of Attorney (HCPOA):** A document through which, pursuant to applicable state law, an adult with decisional capacity delegates to an agent the right to make medical decisions on their behalf in the event decisional capacity is lost. The document must be in writing, in a form similar in substance to the statutory form and properly executed. HCPOAs are one type of Advance Directive.
- **Illinois Department of Public Health (IDPH) Uniform Practitioner Order for Life-Sustaining Treatment (POLST) Form:** A form that allows an individual, in consultation with an authorized practitioner, to make advance decisions about whether they want receive cardiopulmonary resuscitation (CPR) and the type(s) and duration(s) of medical intervention(s) and medically administered nutrition they want in the event they become unable to communicate their decisions about such care. The document is signed by an adult (or authorized representative) and an authorized practitioner.

**PATIENT WITH POLST:**

I. SECTION A Cardiopulmonary Resuscitation: (if patient has no pulse and is not breathing)
   A. If “YES CPR” box is checked, start full resuscitation per Medical Guidelines.
   B. If “NO CPR” box is checked, do not begin CPR.

II. SECTION B explains extent/intensity of treatment for persons found with a pulse and/or breathing.
   A. **Full Treatment**: Primary goal is attempting to prevent cardiac arrest by using all indicated treatments. Utilize intubation, mechanical ventilation, cardioversion, and all other treatments as indicated.
   B. **Selective Treatment:** Primary goal is treating medical conditions with limited medical measures. Do not intubate or use invasive mechanical ventilation. May use non-invasive forms of positive airway pressure, including CPAP and BiPAP. May use IV fluids, antibiotics, vasopressors, and antiarrhythmics as indicated. Transfer to the hospital if indicated.
   C. **Comfort-Focused Treatment:** Primary goal is maximizing comfort through symptom management. Allow natural death. Use medication by any route as needed. Use oxygen,

suctioning and manual treatment of airway obstruction. Do not use treatments listed in Full and Selective Treatment unless consistent with comfort goal. Transfer to hospital only if comfort cannot be achieved in current setting.

III. COMPONENTS OF A VALID POLST form: the EMS System recognizes an appropriately executed POLST form and/or any other written document that has not been revoked, which must contain at least the following elements:

A. Patient's Printed Name

B. Resuscitation order (Section A)

C. Date of patient's signature

*Note: A valid, completed POLST form or previous DNR order does not expire. A new form voids past ones; follow instructions on most recent form.

D. Appropriate Signatures

1. Patient or Legal Representative Signature
2. Relationship of person signing to the patient
3. Authorized Practitioner Name, Signature, and Date of Signature

*Note: No witness is needed for the POLST form to be valid

E. Original form NOT necessary - all copies of a valid form are also valid; form color does not matter, electronic copies are acceptable

IV. Procedure

A. Verify that all required sections of the POLST are completed.

B. Make a reasonable attempt to verify the identity of the patient named in a valid POLST form.

C. Contact medical direction as needed to discuss the situation and advise them of the presence of a POLST form, along with the description of any specific treatments to be withheld that are set forth in the POLST form.

D. If the order is valid and medical direction does not order otherwise, follow the terms of the POLST form, and attach a copy of the POLST form to the patient care report if possible.

E. If there is any doubt as to the validity of the POLST form, treat the patient as soon as possible. Document any concerns in the patient care report.

V. Additional Considerations

A. Revocation of a written DNR or POLST Advance Directive shall be made only in one or more of the following ways:

1. The advance directive is physically destroyed by the authorized practitioner who signed the advance directive or by the person who gave written consent to the advance directive; or
2. The advance directive is verbally rescinded by the authorized practitioner who signed the advance directive or by the person who gave written consent to the advance directive, the word "VOID" is written in large letters across the front of the advance directive, and the advance directive is signed and dated by the authorized practitioner who signed the advance directive or by the person who gave written consent to the advance directive.

B. A power of attorney or surrogate decision maker should not overturn decisions made, documented and signed by the patient.

C. If such documentation is not available, but circumstances or individuals at the scene indicate the patient may not want full treatment (intubation, mechanical ventilation, cardioversion, and other similar treatments):

1. Initiate resuscitative measures and immediately contact medical direction for clarification and direction.
2. The Medical Direction Physician **may** give "No Code" orders to terminate resuscitation.

**PATIENT WITH DNR ORDER:**

DNR order forms can vary by hospital or provider. *Wis. Stat 154.19* states that the Patient should be wearing a valid DNR bracelet. Without a valid bracelet, practitioners should initially follow standing written orders (Medical Guidelines). If a patient or patient's representative notifies provider to the potential existence of an advanced directive or end of life wishes without a valid DNR bracelet on the patient, or if the provider has any questions, contact online medical direction for guidance.

**PATIENT WITH HEALTHCARE POWER OF ATTORNEY (HCPOA) / LIVING WILL:**

I. Individuals may appoint an "agent" to make health care decisions for periods they may become unable to make their own medical decisions. An agent is appointed by the patient via a document called a "Power of Attorney for Health Care." The agent can, in some cases, direct you to withdraw or withhold medical care from the patient.

II. A health care agent generally has no authority to make this decision if the patient has capacity to make their own health care decisions.
   - A. If the patient clinically has capacity, continue to treat the patient, even if thereafter the patient is unable to communicate with you.

III. If someone represents to you that they have a power of attorney to make medical decisions for the patient, follow these procedures:
   - A. Begin treatment of the patient.
   - B. Contact medical direction; explain situation and follow orders received.
   - C. Living Wills/HCPOAs alone may not be honored by EMS personnel unless instructed otherwise by medical direction.
   - D. *The agent named as Power of Attorney for Health Care may generally consent to or refuse any or all care, including resuscitation, on behalf of the patient who lacks decision-making capacity. Any requests must be reported to medical direction.*
   - E. If there is any doubt, continue treatment, contact Medical Direction, explain the situation, and follow orders received.
   - F. Bring any documents received to the hospital and document concerns.

**COURT-APPOINTED GUARDIANS**

Guardians generally have broad authority to make decisions on behalf of the patient, although they do not normally have the authority to withdraw or withhold life sustaining treatments. If someone represents to you that they are a patient's court-appointed guardian, begin treatment of the patient and contact medical direction. Attempt to obtain a copy of the paperwork.

**HOSPICE PATIENTS NOT IN CARDIAC/RESPIRATORY ARREST:**

I. If patient is registered in a hospice program and has a POLST form completed, follow patient wishes as specified for orders for patient not in cardiac arrest.

II. Consult with hospice representatives if on scene regarding other care options.

III. Contact medical direction; communicate patient's status; hospice recommendations; presence of written treatment plans and/or valid advance directive(s) (e.g., POLST, DNR orders). Follow medical direction orders.

IV. If hospice enrollment is confirmed but a POLST form is not on scene, contact medical direction. A DNR order should generally be assumed in these situations; contact medical direction for approval to withhold resuscitation if cardiorespiratory arrest occurs.

V. Hospice or DNR patients who are not in cardiac/respiratory arrest should receive supportive/comfort care while en route to the hospital. Do not withhold oxygen or medications unless specifically stated in the POLST form.

These guidelines should be used in conjunction with "*Termination/Withholding Of Resuscitation In The Field/Notification of Coroner*" guidelines as applicable.

# 1.15 TERMINATION/WITHHOLDING OF RESUSCITATION IN THE FIELD/NOTIFICATION OF CORONER

**Guideline**: Pulseless, non-breathing patients should have full resuscitative efforts, consisting of CPR, defibrillation when applicable, and advanced level response and interventions.

EMS shall not waive (except as listed in **bold** below) or cease resuscitation without a direct order from a Medical Direction Physician, the patient's personal physician, or other recognized physician. The ordering physician assumes responsibility for this order and medical direction should be contacted. All other situations require advanced level response and physician medical direction.

**EMS may withhold resuscitative efforts** when the patient is pulseless and apneic in the following circumstances:

I. The patient has a valid DNR/POLST (follow *Advanced Directive Guidelines*)
II. **The patient has definitive signs of death including at least one of the following:**
    - **A. Rigor mortis (without hypothermia)**
    - **B. Dependent lividity (without hypothermia)**
    - **C. Decomposition of body tissues**
    - **D. Frozen State (inability to compress the chest wall/ice in the airway)**
    - **E. A Fatal/un-survivable injury(s)-an injury clearly incompatible with life:**
        1. **Decapitation**
        2. **Incineration**
        3. **Separation of vital internal organs from the body or total destruction of organs**
        4. **Injuries incompatible with life (such as massive crush injury, complete exsanguination, severe displacement of brain matter)**
III. The patient has an unwitnessed cardiac arrest, is in asystole, and no bystander CPR has been initiated. This does not apply if exposure hypothermia, trauma, submersion, or drug overdose is suspected in the arrest
IV. The patient has cardiac arrest due to severe trauma, has no signs of life, is in asystole, and doesn't respond to injury appropriate Advanced interventions (ex. advanced airway, needle decompression, pericardiocentesis, fluid bolus, and medications as indicated) in consultation with medical direction
V. There is a risk to the health/safety of EMS personnel and the scene is unable to be made safe.
VI. Resources are inadequate to treat all patients (i.e., mass casualty, not including reverse triage situations such as lightning strike)
VII. Death has previously been declared by a physician, medical examiner, or coroner
VIII. Other conditions as determined by the Medical Direction Physician.

**Other Key Considerations:**

I. If there has been transient ROSC or continued shockable rhythm continue resuscitation per "Cardiac Arrest" guidelines and transport the patient to the closest, most appropriate destination
II. Shockable rhythms increase the potential of good neurological outcomes and in general should have resuscitation and transportation.
III. Family/HCPOA requests for termination should be relayed to medical direction.
IV. Resuscitate infants if >20 weeks gestational age, uncertainty of dates or signs of life. Consult with medical direction if considering withholding resuscitation.
V. When there is no response to prehospital cardiac arrest treatment, it is acceptable and often preferable to cease futile resuscitation efforts in the field and contact medical direction (see procedure below)
    - A. All EMS personnel involved in the patient's care should agree that discontinuation of the resuscitation is appropriate.

B. When cardiac arrest resuscitation becomes futile, the patient's family should be notified and supported by the EMS clinicians.

VI. Scene conditions should be evaluated prior to termination of resuscitation. If the resuscitation cannot be safely and/or efficiently performed on scene, transport should be initiated.
   A. Scene management and safety of the crew and public may prevent withholding/discontinuation of resuscitation.
   B. In general, do not cease resuscitation in public places/establishments.

VII. Visibly gravid patients/those estimated to be >20-week gestation have unique resuscitation considerations and early involvement in medical direction should occur in the setting of cardiac arrest

VIII. Patients who are struck by lightning should not have termination of resuscitation in the field without consultation with medical direction

IX. In general, once transport has been initiated resuscitative efforts should be continued until patient can be delivered to an emergency department

**Procedure:**

I. Upon arrival at the scene of a patient in cardiac arrest, the crew should begin treatment per "Cardiac Arrest" guidelines and attach the cardiac monitor. (This is not necessary in the case of definitive signs of death criteria as above).

II. Determine rhythm in two leads on the cardiac monitor. Obtain history from the family or bystanders.

III. Contact medical direction. Describe the facts of the case and the cardiac rhythm. After evaluating the patient's history and assessment information, the physician may decide to order the resuscitation stopped.
   A. Criteria to consider:
      1. Adult, who is not visibly gravid, is normothermic and experienced an unwitnessed nontraumatic arrest by bystanders or EMS;
      2. No bystander CPR has been provided;
      3. The patient has remained in continuous monitored asystole or cardiac arrest with a non-shockable rhythm with no ROSC after Advanced Level resuscitation in the field following discussion with medical direction.
      4. There are no reversible causes of cardiac arrest identified.
      5. Final rhythm is asystole or PEA confirmed in two leads on a printed/documented rhythm strip.
      6. A secure airway is confirmed by capnography/capnometry.
   B. If resuscitative efforts are ceased notify the law enforcement and/or the coroner in the county of the patient's death. Remain at the scene until relieved by a law enforcement officer or coroner.
      1. Do not move the body unless directed to do so by Law Enforcement/Coroner
      2. Record time of no further resuscitation, as given by medical direction, at a minimum document no vital signs, no pupillary response, no heart tones and final rhythm
      3. Document to whom the scene was turned over to.
      4. Do not transport patients who are dead at the scene unless otherwise directed by coroner.
   C. If resuscitation was attempted, all EKG electrodes, defibrillation pads, IV/IOs, invasive catheters (e.g. chest needles) and advanced airway devices should be left in place. Follow *Crime Scene Management*
   D. Provide support to family members as needed until law enforcement or others can assume this role.

# 1.16 SCHOOL BUS INCIDENTS

**OVERVIEW**
This policy was developed to assist in responding to handling of school bus incidents involving the presence of minors. This policy only applies to EMS Systems and their providers that have a pre-arranged agreement with their school district. If there is no pre-arranged agreement, the EMS provider must discuss with medical direction or transport all patients.

**INFORMATION NEEDED**
It is recommended that each EMS agency implement and develop a procedure for releasing uninjured children to a parent, legal guardian, or local school official who is willing and approved to take custody of the children. Once medical direction confirms with EMS providers that minor children are not injured, the custody and responsibility for these uninjured children will remain with the responding EMS provider until the children are transferred to parents, legal guardian, school officials or the hospital.

**OBJECTIVE FINDINGS**
__ Mechanism of injury
__ Number of patients
__ Damage to the vehicle
__ Potential need for additional resources

**CATEGORIES**

Category "A" Bus Incident:
Significant injuries present in one or more children, or the existence of an obvious mechanism of injury that can be reasonably expected to cause significant injuries.

Category "B" Bus Incident:
Minor injuries present in one or more children with no obvious existence of a mechanism of injury that could reasonably be expected to cause significant injuries.

Category "C" Bus Incident:
No injuries present in any children and no mechanism of injury present.

Category "D" Bus Incident:
If the patients have special healthcare needs and / or have communication difficulties, they must be transported to the designated hospital for evaluation and disposition.

**IMPLEMENTATION:**

- Once the category of the incident has been determined, approval to implement this policy must be obtained from medical direction.
- This procedure will be used ONLY if situation is a category "B" or "C" incident.
- All children in a Category "A" or "D" incident will be transported to the closest appropriate facility. Only a legal guardian can sign a refusal for Category "A" or "D". A school representative is NOT considered a legal guardian in this situation.
- If medical direction approves implementation of this policy for a category "B" or "C" incident, names, parents, and contact information must be documented for the children who will not be transported.

- After approval of policy implementation, the EMS Agency will then transfer the custody of the minor children, to the parents, legal guardians or school officials.
- The school officials will follow their established procedure for informing parents and /or legal guardians of the crash / accident / incident. It is the responsibility of the EMS agency in charge of the scene, to direct and confirm that the children are returned to their parents, legal guardians or appropriate school officials.
- All adult patients, 18 years of age or older are evaluated, treated, released, and/ or transported per *Consent/Refusal of Medical Care guidelines.*
- Document all attempts to contact legal guardian, all contacts/discussions with medical direction, criteria that designates as a Category A, B, C, D, to whom care of child released (school official, parent, etc.), and any care rendered to a minor patient.
- ***If EMS providers on the scene feel that any child should be offered medical care, needs evaluation by a physician, or confirmation of custody or responsibility cannot be verified, then the child should be transported by EMS.***

# SECTION 2 MERCY EMS CLINICAL CARE GUIDELINES

# 2.01 AGITATED, ANXIOUS, COMBATIVE, HYPERACTIVE DELIRIUM OR VIOLENT

**Notes:**

- **Restraints:**
  - **Restrained patients shall NOT be placed in a prone position**
  - The application of physical restraints and/or pharmacologic management/sedation when providing EMS care may be required to prevent non-decisional patients from causing harm to themselves or others, to facilitate emergency assessment, or to allow for treatment of life-threatening injury or illness and should only be considered when all less-restrictive preventative measures have either been exhausted or may reasonably be expected to be ineffective
  - Physical restraints are to be utilized SOLELY for the purpose of preventing the patient from harming themselves or others, and only during circumstances in which the threat of harm posed by the patient is clear and immediate. Physical restraints should NEVER be applied to patients with decisional capacity and should NEVER be used for any reason other than the prevention of harm. or in a manner that restricts breathing, circulation, or access for monitoring the patient
  - Patients must not be restrained with hands and feet tied together behind their back, under backboards or mattresses, nor with techniques that compromise the airway or constrict the neck or chest
- Behavioral disturbances are often the result of underlying medical conditions that require immediate medical attention, including but not limited to head trauma, alcohol or drug intoxication, metabolic disease, and psychiatric disorders
- Do not approach an agitated and combative patient before law enforcement has gained control of the situation
  - Do not attempt to access, restrain, care for, or transport an uncooperative patient if you cannot reasonably guarantee your own safety
  - Patients under police custody or who are under arrest must always have a law enforcement officer available during EMS transport
  - If a law-enforcement based restraint must be continued during patient care and transport (i.e. handcuffs), but is otherwise not sanctioned for use by EMS providers, a law enforcement officer should either:
    - Accompany the patient and EMS provider during transport to definitive care, or
    - Discontinue the law-enforcement based restraint intervention favor of an appropriate and sanctioned EMS-based restraint intervention
  - EMS Practitioners must not administer medications to individuals to facilitate arrest by law enforcement
  - Patients in need of immediate medical attention must be transported in an ambulance, not a police vehicle
  - This section should be utilized in conjunction with *Altered Level of Consciousness Guideline*

| | |
|---|---|
| Data | $SpO_2$ in all patients and $EtCO_2$ when able (continuous or frequent re-checks);<br>12-Lead EKG as soon as it becomes practical to obtain one.<br>Blood Glucose to rule out hypoglycemia as a cause of the behavioral disturbance. |
| Goals of Therapy | To care for the agitated, anxious, combative and violent patient in the safest, least invasive method for the patient, responders and public. To evaluate and treat for influencing factors. |
| Monitoring | BP, HR, RR, EKG/$EtCO_2$ (if available), $SpO_2$ every 5 minutes |

## EMERGENCY MEDICAL RESPONDER/EMT

- Initiate *Routine Medical Care Guideline* once it is safe and practical
- Verbal de-escalation should be attempted, and its success or failure should be documented, do not persist if it appears to be futile or making the situation worse

- Consider application of physical restraints as last resort when verbal de-escalation or other methods are ineffective
    - Ensure you have a minimum of four people, one for each limb. All act at the same time.
    - Always keep the patient informed why the restraints are being used
    - Soft restraints or padded hard restraints are preferred for use by EMS personnel
    - Once restrained, the patient must be brought to and transported in a sitting or lateral recumbent (recovery) position
    - EMRs are not allowed to apply physical restraints to patients, but they are not prohibited from providing medical care to a patient who has been restrained by other responders
- Monitor vital signs every 5 minutes $SpO_2$ and $EtCO_2$ (EMT and above, if available)
    - If unable to assess $SpO_2$, consider administration of high flow oxygen
    - Closely and frequently monitor airway, breathing, circulation and mental status, and intervene as necessary
- Acquire 12-Lead EKG and transmit to receiving facility (EMT and above, if available) only after it is safe and feasible for the patient and EMS provider
    - If machine interpretation indicates "***ACUTE MI SUSPECTED***", call for ALS and refer to the *Chest Pain of Suspected Cardiac Origin Guideline*
- Remove restraints when no longer indicated or if restraints interfere with any necessary medical intervention
- If hyperthermia is present treat per *Heat Emergencies Guideline*
- BLS agencies may consider requesting MD-1 response for potential use of ***Haldol*** as a method of sedation.

## AEMT

- IV 0.9% NS Lock or TKO only after it is safe for the patient and EMS provider
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, abdominal pain, or shock. Reassess and repeat as indicate. Have a low threshold to initiate fluids for insensible losses
- PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*

## PARAMEDIC

- Evaluate and document using IMCRASS (Improved Montgomery County Richmond Agitation and Sedation Score) below
- Treatment goal for sedation is to ensure safety to the patient and providers and allow for adequate evaluation and treatment of underlying causes
- Select a medication based upon initial agitation/sedation score. Contact online medical direction prior to polypharmacy to help avoid adverse effects and/or over sedation

| Score | Term | Description | EMS Activity |
|---|---|---|---|
| +4 | Combative | Overly combative, violent, immediate danger to staff | Unable to care for patient without maximal assistance, requires law enforcement |
| +3 | Very agitated | Pulls or removes tubes or catheters, aggressive | Struggles aggressively and forcefully, routine EMS care not possible |
| +2 | Agitated | Frequent, non-purposeful movements | Resists EMS care, requires gentle physical redirection to allow EMS care |
| +1 | Restless | Anxious, but movements are not aggressive or vigorous | Verbally redirectable, follows commands, routine EMS care possible |
| 0 | Alert and Calm | | |
| -1 | Drowsy | Not fully alert but has sustained awakening and eye contact to voice (greater than 10 sec) | Awakens to voice |
| -2 | Light sedation | Briefly awakens with eye contact to voice (less than 10 sec) | Awakens to bumps/potholes in roadway during transport, application of oxygen by NRB or NC |

| | | | |
|---|---|---|---|
| -3 | Moderate sedation | Movement or eye opening to voice (no eye contact) | Eyes open to physical examination, venous tourniquet application and/or BP cuff inflation |
| -4 | Deep sedation | No response to voice but movement or eye opening to physical stimulation | Responds to insertion of NPA or IV start |
| -5 | Unarousable | No response to voice or physical stimulation | No response to insertion of OPA, NPA or IV |

- **Combative, actively violent patient, Score = +4**:
  - Consider disassociating with **Ketamine** 4 mg/kg IM (max dose 400 mg)
    - If IV/IO is already in place 1 mg/kg (max dose 100 mg)
    - Repeat ½ dose at 10 minutes x 1 if inadequate response to initial dose
- **Very agitated patient, routine care not possible, Score = +3**:
  - Consider administration of ***Droperidol*** 10 mg IM for adult patients.
    - Avoid Droperidol for behavioral problems associated with known dementia.
  - Consider administration of initial **Versed** up to 5 mg IM per dose (PEDs 0.05 mg/kg max 5 mg)
    - If IV/IO in place or inadequate response to initial dose. Repeat ½ dose IM/IV at 10 minutes x1
    - Versed is preferred when the patient is suffering from agitation associated with cocaine/stimulant use or alcohol withdrawal
- **Agitated or severely anxious patient, Score = +2**:
  - Consider administration of ***Droperidol*** 5 mg IM, adults only.
  - Consider titrating **Versed** up to 2.5 mg (PEDs 0.05 mg/kg max 2.5 mg per dose) IV/IO/IN/IM per dose, every 5 minutes as needed, max of 5 mg total
- **Restless patient, Score = +1**:
  - Manage patient care with verbal de-escalation and redirection only
- **REQUIRED MONITORING AND DOCUMENTATION FOR EVERY SEDATED PATIENT:**
  - Apply continuous EKG, $EtCO_2$ and $SpO_2$ monitoring
  - Check blood glucose level as soon as possible, treat as indicated per ***Diabetic Emergencies***
  - Obtain temperature if possible
  - Obtain 12-lead EKG once
  - Record complete vital signs, mental status and IMCRASS agitation/sedation score **every 5 minutes**
- **PHARMACOLOGICAL SEDATION CONSIDERATIONS**
  - Avoid sedating/dissociative agents if hypotensive or respiratory depression. Be cautious of paradoxical effect
  - Any patients who require pharmacologic interventions require ALS transport to the hospital
  - Caution with pharmacologic sedation at extremes of age and special populations such as patients with autism and dementia
  - Consider reduction of medication dose by 50% for elderly or small framed
- Obtain 12 lead ECG. Address and treat signs of hyperkalemia per *Cardiac Arrest Guidelines* as applicable.

**FOOTNOTES:**

[1] Mandatory Physical Restraint Documentation

- Document alternative options explored (including verbal de-escalation) and why the restraints were applied (including a description of the threat to self or others)
- The time the restraints were applied, and the time(s) of restraint removal (if done before hospital arrival)
- Who (which agency) applied the restraints
- What kind of restraints
- Vital signs and observations about patient status every five minutes
- Distal neurovascular function on initial restraint application, reassessment and treatment of abnormalities identified
- The position of the patient after restraints were applied
- Medication(s) used and their effects, including adverse effects (if applicable), IMCRASS score before and after medication administration

*Mercyhealth System*

# *Medical Guidelines*

# 2.02 ALLERGY & ANAPHYLAXIS

**Note:**

- Allergic reactions span a continuum from minor to life threatening [1]
- Attempt to gather all medications and take them to the ED
- These treatment guidelines may be applicable for some transfusion reactions.
- Angioedema with significant swelling of the tongue increases the risk of obstructed airway but also makes RSA more difficult and therefore relatively contraindicated.
    - Institute emergent transport and notify the ED for emergency intubation procedures.
    - In isolated Angioedema, Benadryl and Epinephrine are not likely to help but may be attempted if patient in extremis or signs of anaphylaxis

| Data | Severity of Allergy/Anaphylaxis [1] |
|---|---|
| Goals of Therapy | To recognize the patient with an allergic reaction and anaphylaxis and to provide and maintain adequate oxygenation/ventilation and tissue perfusion.<br>To reduce or prevent exposure to antigen.<br>To provide emergent care and expeditious transport to the nearest appropriate medical facility. |
| Monitoring | Vital signs and continuous cardiac monitoring. $EtCO_2$ (if available), $SpO_2$, 12-Lead ECG (if available) |

## EMERGENCY MEDICAL RESPONDER

- Remove offending etiologic agent if possible or remove patient from area of agent to avoid ongoing exposure
    - If due to a bee sting, remove stinger by scraping horizontally with tongue depressor or plastic card. Do not squeeze the venom sac
- Have the patient remove any tight-fitting jewelry from the affected area as applicable
- If altered level of consciousness or signs of shock, keep warm and position patient supine with legs raised as possible
- Indirectly apply ice/cold pack to bite or injection site unless contraindicated
- Administer Oxygen to keep $SpO_2$ > 94% per *Routine Medical Care Guideline*
- **EPI-Pen (>66 lbs / 30 kg)** IM (0.3 mg) or **EPI-Pen Jr (<66 lbs / 30 kg)** IM (0.15 mg) to lateral mid-thigh for moderate or severe reactions). Hold in place for 10 seconds and massage area for 10 seconds after injection
    - Consult medical direction to repeat in 5-10 minutes one time if not improving after initial dose
    - Alternative medical director approved epinephrine auto injectors may also be use
    - **Drawn up epinephrine** in 1cc syringe using EMT IM dosing below only for approved EMR providers with additional training.
- For respiratory symptoms with wheezing, administer nebulized therapy:
    - Albuterol Sulfate MDI 6 Puffs or Albuterol Unit Dose (2.5 mL in 3 mL) administer via handheld nebulizer or mask. May Repeat x 2 if additional doses needed

## EMT

- If unconscious, consider non-visualized airway (See *Respiratory Distress Guideline*)
- **Epinephrine 1mg/1ml** 0.5 mg (peds 0.01mg/kg max 0.5mg) IM for moderate to severe reactions. Repeat every 5 – 10 minutes x3 if patient is not improving, or as ordered per online medical direction.
- For Respiratory Symptoms with Wheezing: Administer Nebulizer Therapy: **Albuterol Sulfate** 2.5mg in 3 ml with **Ipratropium Bromide (Atrovent)** 0.5mg in 2 ml administer per handheld nebulizer, mask or in-line nebulizer; May repeat albuterol X 2 additional doses
  ** If patient is under 3 years of age, do not use Ipratropium Bromide (Atrovent), use only Albuterol
- Consider **Glucagon Adult** 2 mg IM if the patient is taking Beta Blockers and displays refractory bronchospasm and/or hypotension despite receiving Epinephrine.

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, abdominal pain, or shock. Reassess and repeat as indicate
- PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*

## PARAMEDIC

- If unconscious, without gag reflex, consider endotracheal intubation (See *Respiratory Distress Guideline*)
- **Diphenhydramine (Benadryl)** 50 mg IM/IV/IO (PEDs 1 mg/kg max 50 mg) for moderate or severe reactions if not already administered
- Consider **Diphenhydramine (Benadryl)** 50 mg PO if greater than 50kg (peds dose liquid or chewable 1mg/kg max 50mg for >2 y/o older) and available for mild reactions.
- Consider **Glucagon** 2 mg IV/IO if the adult patient is taking Beta Blockers and is not responding to Epinephrine, repeat every 10 minutes, until glucagon depleted
- **Methylprednisolone (Solu-Medrol)** 125 mg IV/IO/IM (PEDs 2 mg/kg) for moderate to severe reactions
- Consider ***Push Dose Epinephrine and Drip*** for Severe Reactions refractory to the above therapies.
- Consider Inhaled **Epinephrine** if stridor Per *Respiratory Distress Guideline*

**FOOTNOTES:**

[1] Severity of Allergy/Anaphylaxis

- Mild Allergic reaction: localized or generalized Urticaria, without swelling of oral or pharyngeal structures, difficulty breathing, hypotension or ALOC
- Moderate Allergic Reaction: oral or pharyngeal swelling is present, mild to moderate difficulty breathing and wheezing are present
- Severe Allergic Reaction (Anaphylaxis): moderate to severe difficulty breathing is present, Syncope/hypotension is present, and ALOC may occur

# 2.03 ALTERED LEVEL OF CONSCIOUSNESS

**Note:**

- Consider causes of ALOC including acidosis, hypoglycemia, hypoxia, toxin exposure/overdose, CO poisoning, Hypovolemia, shock, sepsis, head injury, seizures, arrhythmias
- Collect and document all medications that the patient is prescribed for administration at home

| | |
|---|---|
| Data | Blood Glucose, $SpO_2$, $EtCO_2$, 12-Lead ECG |
| Goals of Therapy | To recognize the patient with an altered mental status and to provide and maintain adequate oxygenation/ventilation and tissue perfusion. To identify and treat possible contributing etiologies and provide expeditious transport to the closest appropriate medical facility |
| Monitoring | Cardiac monitoring, repeat vitals |

## EMERGENCY MEDICAL RESPONDER/EMT

- Administer Oxygen to keep $SpO_2$ > 94% per *Routine Medical Care Guidelines*
- Consider assisting ventilations with bag-valve-mask with high-flow oxygen
- Consider oropharyngeal, nasopharyngeal or supraglottic airway of appropriate size
- If an opioid overdose is suspected, consider **Naloxone (Narcan)** 0.5 mg up to 2 mg IN (max 1 mL per nostril) or IM (EMT and above only) per dose (PEDS dose 0.1mg/kg) to increase the respirations. Using smaller doses of Narcan is recommended, as the goal is only to increase respirations, not fully awaken patient. Repeat dose as necessary based on patient's respiratory effort. Refer to *Toxic Exposure/Overdose Guidelines*
- Check glucose level, if <70 mg/dL, follow *Diabetic Emergencies Guideline*
- If neuro deficits, suspect stroke, refer to *Suspected Stroke Guidelines*

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock. Reassess and repeat as indicate
    - PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*
- If an opioid overdose is suspected, consider **Naloxone (Narcan)** 0.5 mg up to 2 mg IV/IO/IM per dose (ped dose 0.1 mg/kg) to increase the respirations. Using smaller doses of Narcan is recommended, as the goal is only to increase respirations, not fully awaken patient. Repeat dose as necessary based on patient's respiratory effort. Refer to *Toxic Exposure/Overdose Guidelines*

## PARAMEDIC

- If unconscious with no gag reflex, consider supraglottic airway or endotracheal intubation (See *Respiratory Distress Guideline)*
- Suspected toxic overdose, refer to *Toxic Exposure/Overdose Guidelines*

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# *Medical Guidelines*

# 2.04 ASTHMA/COPD

(Includes Reactive Airways Disease, Bronchospasm, Emphysema and Chronic Bronchitis)

**Note:**

- All hypoxic patients should be given enough oxygen therapy to reverse their hypoxia ($SpO_2 \geq 94\%$), even if they have COPD
- All patients must be closely monitored for signs of respiratory depression even while receiving oxygen therapy
- Patients with a history of near fatal asthma are at increased risk of recurrent severe attacks and asthma-related death
- Remember: *"All that wheezes is not asthma"* Always consider the possibility of Congestive Heart Failure in older adults with wheezing
- The absence of wheezing may be indicative of extreme airflow obstruction
- Severity of Adult Respiratory Distress:
    - Mild = RR<20 + minimal additional breathing effort + speaking in complete sentences + minimal subjective distress, No ALOC
    - Moderate = RR 20 to 25 + moderate additional breathing effort + difficult to complete a sentence + moderate subjective distress + No ALOC
    - In asthma patients with severe respiratory distress who progress to cardiac arrest, the paramedic should have suspicion for tension pneumothorax and consider bilateral needle decompression
    - Severe = RR> 25 + marked additional breathing effort + 2- or 3-word sentences + marked subjective distress + possible ALOC

| | |
|---|---|
| Data | $SpO_2$ in all patients (continuous or frequent re-checks); 12-Lead EKG if underlying heart condition suspected; Blood Glucose if DKA is suspected or ALOC is present, work of breathing scale, $EtCO_2$ to check ventilation. |
| Goals of Therapy | To recognize the patient with bronchospasm and to provide and maintain adequate oxygenation/ventilation and tissue perfusion. To provide appropriate treatment and expeditious transport to the nearest appropriate medical facility. |
| Monitoring | BP, HR, RR, EKG, $SpO_2$, $EtCO_2$. |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Allow/assist the patient to assume a position of comfort (usually upright)
- Oxygen: Per nasal cannula at 2-4 LPM or per non-rebreather at 12-15 LPM (depending on the apparent severity), to keep $SpO_2 > 94\%$
- Assist with **Albuterol Sulfate** MDI with spacer (if available) 6 Puffs, may repeat X 2
  Or
- Administer Nebulizer Therapy: **Albuterol Sulfate** 2.5mg in 3 mL, via handheld nebulizer, mask or in-line nebulizer; If no improvement, may repeat albuterol X 2 if needed
- Assisted Ventilation: Consider assisting breathing with gentle synchronous ventilations with bag-valve mask (BVM); Support ventilation with BVM if apnea or hypoventilation occurs
- Airway Adjuncts: If there is loss of consciousness, insert an oropharyngeal, nasopharyngeal, or supraglottic airway of appropriate size depending on presence of gag reflex. Refer to *Respiratory Distress Guideline*
- In cases of Status Asthmaticus (unresponsive to nebs, impending respiratory failure) consider **EPI-Pen (>66 lbs / 30 kg)** IM (0.3mg) or **EPI-Pen Jr (<66 lbs / 30 kg)** IM (0.15 mg) to lateral mid-thigh for moderate or severe reactions). Hold in place for 10 seconds and massage area for 10 seconds after injection
    - Consult Medical Direction to repeat in 5-10 minutes one time as needed
    - Alternative medical director approved epinephrine auto injectors may also be used

- Drawn up epinephrine and syringe using Paramedic IM dosing below dosing only for departments with additional training to do so.
- Avoid Epinephrine for respiratory distress for COPD, or for patients over the age of 55 or with known cardiac disease

## EMT

- Administer Nebulizer Therapy: **Albuterol Sulfate** 2.5 mg in 3 mL with **Ipratropium Bromide (Atrovent)** 0.5 mg in 2 mL administer per handheld nebulizer, mask or in-line nebulizer; May repeat albuterol X 2 additional doses
  ** If patient is under 3 years of age, do not use Ipratropium Bromide (Atrovent), use only Albuterol
- If Patient is in severe distress and responsive, consider CPAP, see *CPAP Procedure*
  - In-line Nebulizer therapy may be performed via in-line method if advanced airway is in place (e.g. i-Gel)
- Status Asthmaticus (administer as above): **Epinephrine 1mg/1ml** 0.5 mg (PEDS 0.01mg/kg max 0.5mg) IM
  - Avoid in COPD or patients over the age of 55 or with known cardiac disease

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock. Reassess and repeat as indicate. Have a low threshold to initiate fluids for insensible losses
- PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*

## PARAMEDIC

- In cases of Status Asthmaticus (unresponsive to nebs, impending respiratory failure) give **Epinephrine 1 mg / 1 mL** 0.5 mg (Pediatrics 0.01 mg/kg) IM
- Consider **Solu-Medrol** 125 mg IV/IO/IM (PEDs dose 2 mg/kg)
- Consider **Terbutaline** 0.25 mg (PEDS 6-11 years old: 0.01 mg/kg max 0.25 mg) SC, see ***Terbutaline (Brethine)***
  - May repeat x1 after 15-30 min, if needed (max combined dose 0.50 mg SC)
- Consider **Magnesium Sulfate** 2 g (PEDs 50 mg/kg) IV slowly (over 10 minutes)
  - Avoid in COPD or patients over the age of 55 or with known cardiac disease
- **For imminent respiratory arrest consider *Push Dose Epinephrine and Drip***
  - Avoid in COPD or patients over the age of 55 or with known cardiac disease
- RSA (if credentialed) should utilize **Ketamine** unless severe hypertension or strong concern for cardiac ischemia/heart failure dictates **Etomidate**
- If patient remains very difficult to mechanically ventilate, consider **Epinephrine** 0.5 mg (Adult) directly into the endotracheal tube. Repeat every 2 minutes until compliance improves
- In asthma patients with severe respiratory distress who progress to cardiac arrest, maintain high suspicion for tension pneumothorax and consider bilateral needle decompression

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# *Medical Guidelines*

# 2.05 BLAST INJURIES

**Note:**

- An explosion is caused by the rapid chemical conversion of a liquid or solid material into a gas with a resultant energy release
- **Primary blast injury**: A unique for of barotrauma, which causes damage to air-filled organs. Be aware of auditory and pulmonary compromise
- **Secondary blast injury**: Trauma caused by shrapnel and other debris
- **Tertiary blast injury**: Casualty becomes a missile and is propelled through the air, with typical patterns of blunt trauma
- **Quaternary blast injury**: All other explosion-related injuries, such as thermal burns, and complications from exacerbation of pre-existing medical conditions
- **Quinary blast injury**: Due to intentional addition of radiological, chemical, or biological compounds to the explosive device with the intent of exposing victims to additional hazards

| | |
|---|---|
| Data | Nature of Device: Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.<br>Method of Delivery: Incendiary / Explosive Nature of Environment: Open / Closed. Distance from Device: Intervening protective barrier. Other environmental hazards, Evaluate for: Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.<br>TBSA Burned |
| Goals of Therapy | To evaluate and provide initial trauma resuscitation and timely application of emergency measures to minimize the morbidity and mortality of injuries. The |
| Monitoring | BP, HR, RR, EKG, Cardiac Monitoring, $SpO_2$, $EtCO_2$. |

## EMERGENCY MEDICAL RESPONDER/EMT

- Scene Safety
- Determine appropriate level of PPE required
- Notify Hazardous Material team as needed
- Determine if decontamination is necessary
- Follow appropriate Routine *Medical*/*Trauma* Guidelines

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock. Reassess and repeat as indicate.
- PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*

## PARAMEDIC

- Consider treatment for Crush Syndrome per *Routine Trauma Guideline*

# 2.06 BRADYCARDIA

**Note:**

**GENERAL CONSIDERATIONS**

- Symptomatic implies that an arrhythmia is causing subjective sensations such as lightheadedness, altered mental status, ischemic chest pain or dyspnea
- Always consider and treat hypoxia in the setting of bradycardia
- Asymptomatic, stable bradycardia may be physiologically normal and should not be treated in the prehospital setting
- In trauma with spine or head injury and bradycardia, consider neurogenic shock or Cushing's Reflex
- **Caution: Limit atropine use in STEMI or suspected cardiac ischemia as tachycardia may increase ischemia**
- Larger Atropine Doses may be needed for organophosphate poisoning: See *Toxic Exposure/Overdose*

**ADULT CONSIDERATIONS**

- Unstable bradycardia in an adult patient:
  - Pulse <50 bpm **with** any signs and symptoms of inadequate cerebral or cardiac perfusion
  - SBP <90 mmHg and/or signs of hypoperfusion
  - Altered Mental Status
  - Signs/symptoms of CHF (dyspnea, crackles, pitting edema)
  - Ischemic chest pain

**PEDIATRIC CONSIDERATIONS**

- In children, bradycardia almost always means hypoxia. Treat for hypoxia first
- Symptomatic bradycardia is a heart rate slower than normal for the child's age (See *Pediatric normal vital signs*) associated with cardiac compromise
- Signs of Unstable Pediatric Patient:
  - Clinical signs of respiratory distress or failure/hypoxemia
  - Apnea
  - Retractions, flaring or grunting
  - Signs of decreased perfusion
  - AMS/Abnormal appearance
  - Inequality of central and distal pulses
  - Slowed or absent capillary refill <3 sec
  - Hypotension (See *Pediatric normal vital signs*)
- For neonatal bradycardia see *Neonatal Resuscitation*
- If despite adequate oxygenation and ventilation, and the pediatric heart rate is <60/min with signs of poor perfusion, begin CPR per *Cardiac Arrest Guidelines*

| | |
|---|---|
| Possible Contributing Factors | • Hypoxia<br>• Hydrogen Ion (Acidosis)<br>• Hyper/hypokalemia<br>• Hypoglycemia<br>• Hypothermia<br>• Toxins/Poisoning/Drugs<br>• Thrombosis (Coronary/Pulmonary)<br>• Trauma (Neurogenic Shock, Increased ICP)<br>• Excessive Vagal Stimulation (suctioning, gagging, vomiting)<br>• Congenital Abnormality, Post-Surgical, Cardiomyopathy, Myocarditis |
| Data | Accurate Heart Rate, Consider manual blood pressure, Toxin/Medication Exposure, Trauma, Temperature, Type of Bradyarrhythmia (Sinus, AV Block) |

| | |
|---|---|
| Goals of Therapy | To recognize the patient with unstable bradycardia and to provide and maintain adequate oxygenation/ventilation and tissue perfusion. To identify and treat contributing factors and provide expeditious transport to the closest appropriate medical facility |
| Monitoring | BP, HR, RR, EKG, Cardiac Monitoring, $SpO_2$, $EtCO_2$. |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- **ENSURE ADEQUATE OXYGENATION AND VENTILATION**
- Administer oxygen to keep $Sp0_2$ >94%
- Check glucose level, if <70 mg/dL, follow *Diabetic Emergencies Guideline*
    - Administer Naloxone per *Toxic Exposure/Overdose Guidelines*
- If the patient is having:
    - Chest Pain – Refer to the *Chest Pain of Suspected Cardiac Origin Guidelines*
    - Shortness of breath – Refer to the *Congestive Heart Failure Guidelines*
- For patients suffering from hypothermia see "*Hypothermia & Frostbite*"
- Monitor pulse and blood pressure frequently

## EMT

- Acquire 12-Lead ECG, if machine interpretation indicates "***ACUTE MI SUSPECTED***" refer to *Chest Pain of Suspected Cardiac Origin Guidelines*
- For unstable patients, initiate Advanced Level intercept

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - PEDs Bolus 20 mL/kg, follow *Hypovolemia & Shock guidelines*

## PARAMEDIC

- Continuous Cardiac Monitoring
- If the patient remains hemodynamically and clinically stable, observe and monitor. Prepare for transport.
    - Place multifunction pads on patient as needed
- Obtain and interpret a rhythm strip and/or 12-Lead EKG if not already done
- **ADULT SPECIFIC INTERVENTIONS**
    - For unstable adult patients, give **Atropine Sulfate** 1 mg IV/IO while initiating Transcutaneous Pacing
        - May repeat every 3-5 minutes to a maximum of 3 mg for adult/adolescent
        - Contraindications: AVB 2˚ Mobitz type 2 or 3˚ with wide QRS; transplanted hearts (lack vagal innervation)
        - Use with caution in suspected ACS or MI
    - **Adult Transcutaneous Pacing**
        - Set the rate for pacing, start at 70 BPM, this may be adjusted for patient's condition
        - Slowly turn up the mA up until evidence of electrical capture occurs (pacer spike followed by a wide QRS on the monitor). Note: this is usually 50 - 150 mA
        - Check for signs of mechanical capture – improvement in pulse, blood pressure, skin and increased $EtCO_2$. If not present, increase mA until mechanical capture (palpable central pulse) is evident
        - Increase voltage by 10% after electrical and mechanical capture established
        - For pain control or sedation while pacing, consider **Fentanyl Citrate** up to 50 mcg IV/IO/IN/IM **if SBP >90 mmHg**, *or* low dose **Midazolam (Versed)** 2 mg IV/IO/IN/IM **if SBP >100 mmHg** (reduce dose by 50% for smaller framed and elderly)
    - If persistently unstable or impending cardiac arrest, consider ***Push Dose Epinephrine or Epinephrine Drip***

- **PEDIATIC SPECIFIC INTERVENTIONS**
    - **Epinephrine** 1 mg / 10 mL, 0.01 mg/kg (0.1 mL/kg), contact Medical Direction for additional dosing
    - **Atropine Sulfate** PEDs 0.02mg/kg (minimum dose 0.1mg, max single dose 0.5mg child) if increased vagal tone or cholinergic drug toxicity
        - May repeat every 3-5 minutes to a maximum of 3 mg for adolescent
        - May repeat every 3-5 minutes to a maximum of 1 mg for child
    - **Pediatric Transcutaneous Pacing**
        - Set the rate for age-appropriate rate
        - Slowly turn up the mA up until evidence of electrical capture occurs (pacer spike followed by a wide QRS on the monitor)
        - Check for signs of mechanical capture – improvement in pulse, blood pressure, skin and increased $EtCO_2$. If not present, increase mA until mechanical capture (palpable central pulse) is evident
        - Increase voltage by 10% after electrical and mechanical capture established
        - For pain control or sedation during pacing, consider **Fentanyl** Pediatric dose up to 1mcg/kg IV/IO and 2mcg/kg IN max dose 50mcg per bolus **or MIDAZOLAM 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM)** (max single dose 2 mg)
- If no improvement, consider:
    - Beta-blocker Toxicity:
        - **Glucagon 2mg IV/IO, Pediatric** 0.05 mg/kg IV/IO. Check blood sugar as Beta-blocker overdoses may result in hypoglycemia
    - Calcium channel blocker Toxicity or suspected Hyperkalemia in extremis:
        - **Calcium Chloride** 1 g **SLOW** (PEDs 20 mg/kg) IV/IO
        - If no improvement, consider **Glucagon** 2mg, Pediatric 0.05 mg/kg IV/IO/IM
    - Opiate toxicity:
        - **Narcan** 0.1 mg/kg IV/IO/IN/IM (1/2 dose each nostril) (usual adult dose is 0.5 mg - 2 mg per dose max of 4 mg)

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*Medical Guidelines*

# 2.07 Brief Resolved Unexplained Event (BRUE) (Pediatric Specific)

**Note:**

- A Brief Resolved Unexplained Event, or BRUE, is an event occurring in an infant younger than 1 year old when the observer (parent, guardian) reports a sudden, brief, and now resolved episode of 1 or more of the following:
  - Cyanosis or pallor
  - Absent/decreased/irregular breathing
  - Marked change in tone (hyper- or hypotonia), altered level of responsiveness
- These events are very alarming for parents and caregivers and may cause a great deal of anxiety. EMS must provide a calming presence while providing care for the patient
- By definition, any abnormality identified in history or physical exam would indicate the presence of another condition, and therefore would rule out BRUE
- Maintain a high suspicion for abuse

| | |
|---|---|
| Data | Gestational Age, $SpO_2$, Blood Sugar if altered LOC |
| Goals of Therapy | Identification and treatment underlying/causative condition, transport to an appropriate medical facility. |
| Monitoring | $SpO_2$, Cardiac monitoring if indicated |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline*
- Remain calm and provide reassurance for parents/caretakers
- Consider 12-lead EKG and transmission (EMT and above) if history or exam raises concern for cardiac arrhythmia
- If respiratory distress identified, follow the *Respiratory Distress Guidelines*

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated.
  - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guidelines*

## PARAMEDIC

- Routine medical care with cardiac monitoring

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# *Medical Guidelines*

# 2.08 BURNS

**Note:**

- This guideline applies to thermal burns, chemical burns and electrical burns
- Scene safety is of utmost concern
- Patients with burns are at high risk for infection. The use of PPE also helps to protect the patient from potential cross contamination from caregivers
- Loosen and remove any clothing and jewelry that can become constricting when tissue swells
- Remove patient from the heat source, stop the burning process as needed. However, burns over 10% should not be additionally cooled due to possibility of causing hypothermia. Avoid application of ice
- Even if the patient meets criteria for burn center referral, they generally **do not** necessarily need to be airlifted directly to a burn center from the scene. The closest appropriate trauma center is the recommended initial receiving hospital
- In the presence of major trauma (in addition to the burn), stabilizing life-threatening injuries on scene and during transport takes precedence over the care of the burn
- Circumferential full-thickness burns of the trunk and neck may impair ventilation and must be closely monitored.
- Airway burns can rapidly lead to upper airway obstruction and respiratory failure
- If patient in shock remember that carbon monoxide/cyanide poisoning is a common complication of burns suffered in an enclosed space (see *Toxic Exposure/Biologics/Overdose Guidelines*)
- Electrical/Lightning
    - Ensure all items are de-energized
    - Note entrance and/or exit wounds if electrical or lightning strike and be aware of potential associated internal injuries from explosion, electrical shock, or fall
    - Apply spinal motion restriction for victims of musculoskeletal trauma associated with the electrocution
    - In cases of cardiac arrest due to electrical contact or burns (including lightning strikes), aggressive resuscitation should be attempted, as survival rates may be better than medical arrests
- For Chemical burns and decontamination, refer to Material Safety Data Sheets
    - Brush off powder, if present
    - Some chemicals require aggressive irrigation
    - Remove patient clothing if needed
- Radiation
    - If the patient is contaminated with radioactive material, they will need decontamination by specifically trained personnel
    - Exposed victims do not present a hazard to responders unless radioactive contamination is present

| | |
|---|---|
| Data | Body Surface Area Burned estimate, voltage (as applicable), EKG, $EtCO_2$, $SpO_2$, |
| Goals of Therapy | Stop the burning process<br>To maintain adequate oxygenation/ventilation and tissue perfusion and reduce the potential for infection:<br>Provide an adequate airway for the patient with burn trauma.<br>Provide adequate fluid resuscitation therapy as well as pain control.<br>Rapidly Transport the patient to an appropriate facility.<br>Obtain an accurate mechanism of injury, ruling out the possibility of associated traumatic injury. |
| Monitoring | Monitor for cardiac dysrhythmias, increasing respiratory distress and signs of shock |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline* and *Routine Trauma Guideline*
- If in cardiac arrest, see *Cardiac Arrest Guidelines*
- Remove burned and/or contaminated clothing
- Administer oxygen to keep $SpO_2$ > 94%

    - If inhalation of hot or toxic gasses is suspected administer 100% Oxygen
    - Humidify Oxygen if possible
- If less than 10% body surface area (BSA), dress burns with wet saline dressings or approved burn dressings, but be careful not to induce hypothermia
- Cover burns dry dressings or clean sheets, or approved burn dressing
- Do not initially break blisters
- Consider Advanced response for airway management in the setting of:
    - Carbonaceous sputum
    - Singing of nasal hairs
    - Swelling of the lips, tongue or pharynx due to burns
    - Hoarse voice or stridor
    - Increasing respiratory distress
    - Decreased level of consciousness with no gag reflex
- Consider **Albuterol** for bronchospasm per *Asthma/COPD guidelines*

## AEMT

- IV 0.9% LR/NS Lock or KVO
- For hypotension or signs of hypovolemia shock, administer fluid bolus per shock guidelines reassess and repeat as indicated. Consider other injuries or cyanide/carbon monoxide poisoning for hypotension or signs of hypovolemic shock
- Advanced Burn Life Support initial fluid rates (Lactated Ringers is Preferred) for patients with visibly large burns are based on patientage:
    - 5 years old and younger – Contact Medical Direction
    - 6-13 years old – 250 mL per hour
    - 14 years and older – 500 mL per hour
    - Keep track of total fluid infused

## PARAMEDIC

- Continue pain control, refer to *Pain Management Guidelines*
- Consider RSA (if credentialed)
    - If the patient remains alert or has an intact gag reflex AND there is carbonaceous sputum, singing of nasal hairs, swelling of the lips, tongue or pharynx due to burns, a hoarse voice or stridor, or other signs of respiratory distress. Refer to *Respiratory Distress Guidelines*
- For Hydrofluoric Acid Burns or Suspected Cyanide Exposure see *Toxic Exposure/Biologics/Overdose Guidelines*

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# *Medical Guidelines*

# 2.09 CARDIAC ARREST

**Note:**

- Unlike adult cardiac arrest, which is usually due to a primary cardiac abnormality, pediatric cardiac arrest most often occurs as a result of hypoxia
- Capnography should be used as early as possible to provide feedback of quality of compressions. Capnography may be used with mask ventilations and is required with any advanced airway placement
- Compression quality is paramount to patient survival. If possible, patients should not be moved if it will compromise quality of compressions. If available, use a mechanical compression device during movement
- For patients suffering cardiac arrest due to hypothermia see *Hypothermia & Frostbite*
- For patients with identifiable Do Not Resuscitate (or equivalent such as POLST) see *Advanced Directives/Hospice*
- These guidelines should be used in conjunction with *Termination/Withholding Of Resuscitation In The Field /Notification of Coroner* guidelines, as applicable
- For patients in arrest due to traumatic etiology see *Routine Trauma Care*

| | |
|---|---|
| Data | Initial Cardiac rhythm, Bystander Resuscitation, Advanced Directives, $EtCO_2$, |
| Goals of Therapy | To recognize the patient requiring cardiopulmonary resuscitation and to restore stable cardiac rhythm with adequate cardiac output and perfusion. |
| Monitoring | Cardiac Monitoring, Vital Signs, and $SpO_2$, $EtCO_2$ |

## EMERGENCY MEDICAL RESPONDER/EMT

- A CODE COMMANDER should assign duties according to MCMAID prior to arrival, MCMAID duties will occur simultaneously but must be coordinated
- Establish that the patient is unresponsive, and not breathing normally
- **First Priority: M-(metronome) Quality Chest Compressions**
  - Initiate manual continuous chest compressions
    - Ensure a rate of 100-120/minute
- **Second Priority: C-(compressions) Quality Chest Compressions**
  - Assign at least two compressors switching every other minute, checking each other's quality
  - Depth
    - **Adults** compress 2 to 2.4 inches
      - 30:2 Compression to Ventilation Ratio until advanced airway placed
    - **Pediatrics**
      - Compression depth is approximately 1/3 AP chest depth about 1.5 inches in infants and 2 inches in children
      - For multiple rescuer CPR in children, 15:2 is the recommended compression-to-ventilation ratio
      - Neonates 3:1 is the recommended compression-to-ventilation ratio
  - The heel of the compressor's hand should come off the chest, ensuring full recoil
  - Minimizing any pauses to <10 seconds
  - Apply mechanical CPR device if available and indicated for adults
- **Third Priority: M-(monitor) Defibrillate**
  - Attach and run the defibrillator as soon as one is available and ready
  - Immediately resume next round of compressions when prompted by AED or defibrillation shock is delivered.
  - If refractory to multiple shocks an attempt to change pad location and energy vector may be warranted
  - If refractory to multiple shocks and 2nd defibrillator available consider dual sequential defibrillation
  - **Pediatric Considerations**
    - It is acceptable to use adult pads if pediatric pads unavailable
    - First Shock 2 J/Kg

        - Second Shock 4 J/kg
        - Subsequent doses greater than or equal to 4 J/kg to a max of 10 J/kg or adult dose
- **Fourth Priority: A-(airway)**
    - Ventilate with 100% oxygen
        - Supraglottic Airway by First Responder/EMT and above and when feasible, orotracheal intubation attempt by paramedic when feasible
        - Confirm all airways per *Routine Medical Care Guideline*
        - Airway strategy should not interruption of chest compressions
        - Ventilate with only enough volume to just make the chest rise
            - **For Adults Ventilate at 1 Breath every 6 seconds**
            - **Pediatric Ventilate at 1 Breath every 3 seconds**
            - **Neonates**, 3:1 is the recommended compression-to-ventilation ratio
        - Rates exceeding the above may compromise hemodynamics
    - Deliver enough volume over one second to make chest rise
    - The airway management strategy should not interrupt compressions
    - If ROSC, acquire 12-Lead EKG, if machine interpretation indicated "***ACUTE MI SUSPECTED***" see *Chest Pain of Suspected Cardiac Origin Guidelines* and *Post-ROSC Care Guidelines*

## AEMT

- IV/IO 0.9% NS Lock or KVO
- IV is preferred route for ACLS medications
- Initiate a normal saline bolus per *follow shock guidelines*, reassess and repeat as indicated
    - PEDs Bolus 20 mL/kg, *follow shock guidelines*

## PARAMEDIC

- Monitor basic rescuer interventions closely, ensure quality, uninterrupted chest compressions
- For manual defibrillation by paramedics – maximum joules should be used for ventricular fibrillation/tachycardia
- **Sixth Priority: D-(drugs) Proceed to ACLS/PALS resuscitation medications after second shock or immediately for non-shockable rhythms**
- **Epinephrine** 1 mg / 10 mL, 1 mg IV/IO initially and then repeat every 5 minutes
    - Ped dose 0.01 mg/kg max 1 mg/dose
- If any shocks indicated AED or manual, give **Amiodarone** 300 mg IV/IO (PEDs dose 5 mg/kg) followed by another **Amiodarone** 150 mg if still refractory after 2 more cycles of compressions (4 minutes)
    - If adult patient regains pulse prior to amiodarone administration but has received defibrillations, initiate **Amiodarone** 300 mg IV/IO infusion and give slowly over 20 minutes to prevent further arrhythmias
    - No maintenance drip is necessary if the patient has received **Amiodarone** 300 mg or more bolus during the resuscitation. If arrhythmias develop, follow appropriate guidelines
- If supraglottic airway in place, consider intubation as soon as practical. Confirm all airways per *Routine Medical Care Guideline*
- If refractory V-Fib or Torsades de pointes, consider **Magnesium Sulfate** 2 g IV/IO (PEDs dose 50 mg/kg)
- Hyperkalemia should be treated pre-arrest as soon as it is noticed. Pre-arrest and intra-arrest therapy is similar [2]
    - Give **Calcium Chloride (10%)** 1,000 mg IV/IO (PEDs Dose 20 mg/kg) over **SLOW** over 2-5 minutes
        - May repeat x 1 as indicated
    - Give **Sodium Bicarbonate (8.4%)** 50 mEq IV/IO (PEDs 1 mEq/Kg)
        - May repeat as x1 as indicated
    - Consider **Albuterol Sulfate** 10 mg via continuous neb
        - **Pediatrics** less than 1 year old 2.5 mg, older than 1-year old 5mg via nebulizer
- Identify and correct potentially reversible causes of cardiac arrest: **"The H's and the T's"**
    - "The Five H's" (treatment orders are in parentheses)
        - Hypovolemia (Infuse Normal Saline wide open)
        - Hypoxia (Place an advanced airway and administer high-flow oxygen at a ventilation rate of 10/minute with only enough volume to make chest rise. [1])
        - Hydrogen Ion, i.e. acidosis (Perform ventilation [1])
        - Hyperkalemia (Treatment listed above)

        - Hypothermia (See *Hypothermia & Frostbite Guidelines*) – consider early rapid transport to center with warming capabilities
    - "The Five T's" (treatment orders are in parentheses)
        - Toxins (See *Toxic Exposure/Biologics/Overdose Guidelines*)
        - Tamponade (PARAMEDIC: Administer saline bolus, consider pericardiocentesis, consider early transport for definitive therapy)
        - Tension pneumothorax (PARAMEDIC: Perform needle decompression)
        - Thrombosis, cardiac i.e. myocardial infarction (See *Chest Pain of Suspected Cardiac Origin Guidelines,* consider early rapid transport for definitive therapy)
        - Thrombosis, pulmonary i.e. pulmonary embolism (No specific prehospital treatment available, consider early transport to appropriate facility)
    - Point-of-care-Ultrasound (PoCUS) can be helpful in evaluation several potentially reversible causes of cardiac arrest. Use of PoCUS requires specific training/credentialing prior to use. Refer to *Cardiac Ultrasound Procedure Guideline*

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# *Medical Guidelines*

# 2.10 CHEST PAIN OF SUSPECTED CARDIAC ORIGIN

**Note:**

- It is important to acquire a rapid 12-Lead EKG (ideally in <10 minutes of first medical contact) with good skin prep and in the supine position as much as possible
- A normal ECG does not rule out myocardial infarction
- Patients suffering from potential myocardial ischemia should limit exertion, this includes ambulation if possible
- Adult Inclusion Criteria:
    - Chest pain or discomfort in other areas of the body (e.g., arm, jaw, epigastrium) of suspected cardiac origin, shortness of breath, associated or unexplained sweating, nausea, vomiting, or dizziness
    - Atypical or unusual symptoms are more common in women, the elderly, and diabetic patients. May also present with CHF, syncope, and/or shock
- Some patients will present with likely non-cardiac chest pain and otherwise have a low likelihood of ACS (e.g. blunt trauma to the chest). For these patients, defer the administration of aspirin (ASA) and nitrates and treat per *Pain Management Guideline*

| | |
|---|---|
| Data | $SpO_2$, 12-Lead ECG, Blood Sugar if Diabetic, Medications, PMH |
| Goals of Therapy | Identify ST-elevation myocardial infarction (STEMI) quickly<br>Determine the time of symptom onset<br>Activate hospital-based STEMI system of care<br>Monitor vital signs and cardiac rhythm and be prepared to provide CPR and defibrillation if needed<br>Administer appropriate medications<br>Transport to appropriate facility<br>Reduce chest pain<br>Reduce risk of lethal arrhythmias |
| Monitoring | Cardiac monitoring, $SpO_2$ and serial 12-Leads |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Titrate oxygen to a saturation of 94-98%
- If the patient also experiences shortness of breath, follow the *Congestive Heart Failure Guideline*
- Administer **Aspirin** 324 mg PO (4) 81 mg chewable tablets for adults unless the patient is truly allergic or has taken aspirin prior to calling EMS

## EMT

- Acquire 12-Lead and transmit to receiving facility
    - If machine interpretation indicates "***ACUTE MI SUSPECTED***", call for ALS and make arrangements to transport to nearest STEMI receiving facility if operationally feasible, notify receiving facility
    - Place defibrillation pads
    - Activate Code STEMI to receiving facility as rapidly as possible
- Performance of serial EKGs is encouraged for symptomatic patients with EKGs initially non-diagnostic for STEMI
- All EKGs should be made available to treating personnel at the receiving hospital, whether hand delivered as hard copy or transmitted from the field
- If unable to obtain 12-lead, request ALS or continue to nearest hospital, whichever is faster to acquire the 12-lead
- If patient experiences angina, contact online medical direction to consider assisting the patient in administering the adult patient's prescribed **Nitroglycerin** sublingually, unless the Systolic BP <110 mmHg
    - Avoid Nitroglycerine if patient has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours
    - Repeat BP (before) and Nitroglycerin dose every 5 minutes x 3, or until pain is relieved
    - Discontinue Nitroglycerine if the Systolic BP drops below 110 mmHg

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - PEDs Bolus 10 mL/kg, *follow Hypovolemia & Shock guidelines*
- Consider **Nitroglycerin** 0.4 mg SL for adult ischemic chest pain, repeat every 5 minutes as long as Systolic BP > 110 mmHg is maintained, max of three doses

## PARAMEDIC

- Monitor EKG and interpret 12-lead
- Obtain 2nd IV and place defibrillation pads if STEMI identified.
- Consider **Nitroglycerine** paste 1" to left chest for adult ischemic chest pain unless Systolic BP < 110 mmHg
    - Avoid NTG if patient has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
- Perform serial 12-Lead EKG and compare with initial. Provide copies to receiving provider
    - Consider V4R, if hypotensive or inferior infarct is suspected
    - Consider posterior (primarily V8) leads if depression is noted in early V leads, to look for posterior infarct
- Consider **Fentanyl Citrate** 50-100 mcg IV/IO/IM, may repeat with max total dose of 200 mcg for persistent pain (reduce dose by 50% for smaller framed and elderly) or **Dilaudid** 0.5-1 mg IV/IO/IM, may repeat in 20 minutes if indicated-max total dose 3 mg per *Pain Management Guideline*
- Consider Metoprolol 5mg IVP for patients who have BP above 140/90 and/or heart rate above 120. This dose may be repeated every 5 minutes up to three total doses.

**FOOTNOTES:**

12 Lead Views

| | | | |
|---|---|---|---|
| I Lateral | aVR | V1 Septal | V4 Anterior |
| II Inferior | aVL Lateral | V2 Septal | V5 Lateral |
| III Inferior | aVF Inferior | V3 Anterior | V6 Lateral |

Reciprocal Locations

| Site | Facing | Reciprocal |
|---|---|---|
| Septal | V1, V2 | None |
| Anterior | V3, V4 | None |
| Anteroseptal | V1, V2, V3, V4 | None |
| Lateral | I, aVL, V5, V6 | II, III, aVF |
| Anterolateral | I, aVL, V3, V4, V5, V6 | II, III, aVF |
| Inferior | II, III, aVF | I, aVL |
| Posterior | V7, V8, V9 | V1, V2, V3, V4 |

# 2.11 CONGESTIVE HEART FAILURE/PULMONARY EDEMA: ADULT

**Note:**

- Acute myocardial infarction may present with shortness of breath (alone) and new onset acute congestive heart failure (CHF)
- Hypertension in the setting of shortness of breath should prompt additional evaluation for signs of CHF

| | |
|---|---|
| Data | $SpO_2$, $EtCO_2$, 12-Lead EKG acquisition |
| Goals of Therapy | Differentiate CHF from other causes of dyspnea, reduce the work of breathing, improve pump function, and improve oxygenation and ventilation. |
| Monitoring | Carefully monitor blood pressure, respiratory effort, level of consciousness, $SpO_2$, and $EtCO_2$ |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Allow/assist the patient to assume a position of comfort (usually upright)
- Oxygen: Per nasal cannula at 2-4 LPM or per non-rebreather at 12-15 LPM (depending on the apparent severity) keep $SpO_2$ > 94%, humidify if possible
- Assisted Ventilation: Consider assisting breathing with gentle synchronous ventilations with bag-valve mask (BVM); Support ventilation with BVM if apnea or hypoventilation occurs
- If patient is unresponsive, with no gag reflex, utilize supraglottic airway device
- If the patient is wheezing, consider **Albuterol Sulfate** 2.5 mg in 3 mL, administer per handheld nebulizer or mask
    - May repeat X 2 additional doses
- Consider **Aspirin** per *Chest Pain of Suspected Cardiac Origin Guideline*
- In cases of suspected pulmonary edema due to other noncardiogenic causes (such as irritant inhalation, abrupt opioid withdrawal, fluid overload), provide supportive care to promote adequate oxygenation. Follow *Respiratory Distress Guideline*

## EMT

- Acquire 12-Lead EKG, if patient is not supine note as such
- If the patient complains of chest pain (angina):
    - Consider **Aspirin** per *Chest Pain of Suspected Cardiac Origin guideline*
    - If the patient is prescribed nitroglycerine, contact online medical direction to consider assisting them in taking, providing systolic blood pressure > 110 mmHg
        - Avoid Nitroglycerine if patient has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours
        - Repeat BP (before) and Nitroglycerin dose every 5 minutes x 3, or until pain is relieved
        - Discontinue nitroglycerine if the Systolic BP drops below 100 mmHg
- Initiate CPAP, refer to *CPAP Procedure*, use Nitroglycerine spray or ensure nitro tablets have dissolved prior to initiating CPAP

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
- Consider **Nitroglycerin** 0.4 mg SL tables or spray, repeat every 5 minutes as long as SBP > 110 mmHg is maintained, no maximum dose
    - If SBP > 160 mmHg may use **Nitroglycerin** 0.8mg (2 SL spray or tablets) every 3-5 minutes. If SBP < 160 mmHg after initial 0.8mg dose, use 0.4mg dose for subsequent doses
    - Note: No Nitroglycerine if patient has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours

## PARAMEDIC

- For CHF Give **Nitroglycerin** 0.4 mg (1 sublingual spray or tablet) every 3-5 minutes. No maximum dose as long as a SBP >110 is maintained
  - If SBP>160 may use **Nitroglycerin** 0.8mg (2 sublingual spray or tablets) every 3-5 minutes. If SBP<160 after initial 0.8mg dose, use 0.4mg dose for subsequent doses
  - Apply 1" of Nitroglycerine **Paste** for patients on CPAP after initial sublingual dose, hold if SBP ≤ 110 mmHg
  - If SBP <110 mmHg withhold NTG
  - If hypotensive and signs of CHF, Consider *Push Dose Epinephrine* to maintain SBP >90 mmHg
  - Note: No Nitroglycerine if patient has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours
- Consider RSA if any of the following indications are met:
  - A trial of CPAP fails to improve the work of breathing or oxygenation
  - There is ALOC and the gag reflex is intact
  - Respiratory failure is imminent (e.g., severe fatigue)
  - *Respiratory Distress Guidelines*

### FOOTNOTES:

[1] Severity of Respiratory Distress:

- Mild = RR<20 + minimal additional breathing effort + speaking in complete sentences + minimal subjective distress, No ALOC
- Moderate = RR 20 to 25 + moderate additional breathing effort + difficult to complete a sentence + moderate subjective distress + No ALOC
- Severe = RR> 25 + marked additional breathing effort (retractions/accessory muscle use) + 2- or 3-word sentences + $SpO_2$ is <94% + possible ALOC

# 2.12 DIABETIC EMERGENCIES

| | |
|---|---|
| Data | Contributing Factors [1] Blood Glucose, Medications for Diabetes, Insulin Pump [3] |
| Goals of Therapy | Restore normal mental status. See medication section for alternative dosing |
| Monitoring | Repeat blood glucose, ensure patient safety prior to obtaining waiver [2] |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ > 94%
- Monitor vital signs
- Check blood sugar level:
  - Blood Sugar < 70 mg/dL, conscious with intact gag reflex, give **Glucose Oral Gel** PO
    - Adult Dosing 25 g per dose
    - **Pediatric** Dosing: 0.5–1 g/kg max 25g per dose
  - Blood Sugar < 70 mg/dL, with altered mental status
    - If available, encourage patient or their family to use **Glucagon kit** or **Glucagon auto injector**
  - If unable to check blood sugar, and concerning signs are present, assume hypoglycemia and treat

## EMT

- Check blood sugar level:
  - Blood Sugar < 70 mg/dL, with altered mental status
    - **Glucagon** 1 mg IM, may repeat x1 in 15min
      - PEDs <20 kg give ½ dose, may repeat x1 in 15min

## AEMT

- IV 0.9% NS Lock or KVO
- Blood sugar <70 mg/dL and patient with altered mental status:
  - Adults: administer **Dextrose 10%** infuse 125 mL, recheck blood sugar, repeat dose as indicated
  - PEDs dose: **Dextrose 10%** 5 mL/kg to max of 125 mL, recheck blood sugar, repeat dose as indicated
  - Administer additional dose as above if blood sugar remains below 70 mg/dL
  - Reassess BG and mental status 5 minutes after completion of infusion
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, abdominal pain, or shock. Reassess and repeat as indicate
  - PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*
- In adults, slow volume expansion of up to 20 mL/kg up to 2 L for blood sugar > 250 mg/dL. LR is preferred for large volume crystalloid infusion
- Pediatric patients if symptoms of hypovolemic shock follow shock guidelines

## PARAMEDIC

- Evaluate for and treat for hyperkalemia as indicated

**FOOTNOTES:**

[1] Contributing factors

- Too much or too little insulin or other antihyperglycemic medication
- Decreased PO intake?
- Overexertion

- Dehydration
- ACS
- Illness

[2] Ensuring Patient Safety/Refusal

- IF symptoms of hypoglycemia resolved after treatment, still advise of transport, release without transport should only be considered if **all** of the following are true:
    - Patient returns to normal mental state, clinically has capacity and has with no focal neurologic signs/symptoms after receiving glucose/dextrose and is refusing transport
    - Repeat glucose is greater than 80 mg/dL
    - Patient takes only insulin or metformin for diabetes and does not take other oral agents such as glipizide or glyburide.
    - A clear cause of the hypoglycemia is identified (i.e. missed meal)
    - Adequate social support is available
    - The patient has access to food and has ability to eat with EMS personnel on scene.
    - Reliable adult is present
    - The patient is not ill or in need of immediate medical attention
    - Document proper IV removal and site inspection
    - Hypoglycemic patients who have had a seizure should be transported to the hospital regardless of their mental status and response to therapy.

[3] For patients with insulin pump who are hypoglycemic with associated altered mental status (GCS less than 15)

- Stop the pump, disconnect, or remove at insertion site if patient cannot ingest oral glucose or ALS is not available
- Leave the pump connected and running if able to ingest oral glucose or receive successful Advanced Level interventions

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# *Medical Guidelines*

# 2.13 ECLAMPSIA, PREECLAMPSIA

**Note:**

- Pre-eclampsia is a multi-system disorder related to pregnancy, characterized by hypertension and output of protein in the urine, typically arising between 20 weeks of pregnancy and 6 weeks post-partum
    - Other symptoms of Preeclampsia include epigastric abdominal pain, nausea, swelling of hands and feet
- **Severe Features** in the setting of Elevated Blood Pressure in Pregnancy and up to 6 weeks post-partum
    - Acute pulmonary edema
    - Right upper quadrant or epigastric abdominal pain
    - A new or severe acute headache with blurred or loss of vision
    - SBP >160 mmHg or DBP >110 mmHg even without other symptoms
- Eclampsia is characterized by new-onset tonic-clonic, focal, or multifocal seizures in the absence of other causative conditions such as hypoglycemia or drug/alcohol withdrawal
    - Eclampsia can occur during pregnancy or up to 6 weeks post-partum
    - Patients may or may not be hypertensive. If hypertension is present, treat or plan to treat as below
- Pre-eclampsia and Eclampsia increase the risk of complications including preterm labor, placental abruption, hemorrhagic stroke, pulmonary edema, coagulopathy postpartum hemorrhage, and/or death to either the mother or fetus
- The closest appropriate facility with obstetrical labor and delivery services is the recommended receiving hospital
- Post-partum patients may be identified with a colored band identifying "Post-Birth Alert" or other similar wording

| | |
|---|---|
| Data | PMH, Gestational History, Last Menstrual Period, Prenatal Care, $SpO_2$, Blood Sugar, Blood pressure |
| Goals of Therapy | • Recognize, prevent and treat eclamptic seizure activity.<br>• Recognize elevated blood pressure and protect the patient from the effects of high blood pressure (e.g., cerebral hemorrhage, renal disease, cardiomyopathy).<br>• Improve uteroplacental blood flow<br>• Ensure safe transport to a facility capable of caring for the mother and fetus |
| Monitoring | Blood pressure, HR, $SpO_2$, Neuro Status; Cardiac Monitor for possible rhythm disturbances, Reflexes |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline* and *Emergency Obstetrics and Childbirth Guidelines*
- Seizure precautions including protect the patient with ongoing seizures from harming themselves by clearing away potential hazards and placing a pillow or padding under the head, avoiding CNS stimulation such as bright lights and loud sounds
- Administer oxygen to keep $SpO_2$ > 94%
- Obtain blood glucose. If < 70 mg/dL refer to *Diabetic Emergencies Guideline*
- Consider oropharyngeal, nasopharyngeal, or supraglottic airway, if the patient is unable to maintain a patent airway. Ventilate or assist ventilations with a bag-valve-mask connected to high-flow oxygen as indicated
- Confirm manual blood pressure

## EMT

- Obtain Advanced Level Intercept
- Avoid supine position, Transport pregnant patients on left side
- Obtain 12-Lead EKG

## AEMT

- IV 0.9% NS Lock or KVO

## PARAMEDIC

- **Hypertension with Severe Features**:
    - Defined as a pregnant patient from 20 weeks gestation to 6 weeks postpartum with SBP 140-159 or DBP 90-109 mmHg on 2 separate measurements with
        - Acute pulmonary edema
        - Right upper quadrant or epigastric abdominal pain
        - A new or severe acute headache with blurred or loss of vision

      **OR**
    - SBP > 160 mmHg or DBP > 110 mmHg on 2 separate measurements without above features
- Administer **Magnesium Sulfate** 4 g IVPB over 20 min with primary IV running wide open during administration
    - Monitor closely for potential toxicity including hypotension, muscle weakness (including respiratory muscle paralysis), and heart rhythm disturbances
    - For presence of respiratory failure or arrhythmias following Magnesium infusion, give **Calcium Chloride** SLOW 500 mg IV/IO over 5 min
- **Eclampsia**:
    - Ongoing seizures should be treated with **Midazolam (Versed**) 5 mg IV/IO or up to 10 mg IM may repeat x 1 in 10 minutes (max 20 mg)
    - Administer **Magnesium Sulfate** (as above)
    - Monitor patient closely and correct for hypotension, sedation and respiratory depression. Treat as indicated
    - If the fetus delivers after a Benzodiazepine is given to the mother, monitor the newborn for signs of respiratory depression. Be prepared to assist ventilations and provide oxygen
- For ongoing Hypertension of SBP >160 mmHg and DBP >110 mmHg
    - Consider **Labetalol** 10 mg IVP over 2 min, if no effect, may repeat 20 mg IVP in 10 min to a max of 100 mg
    - If Labetalol not available, **Metoprolol** 5 mg IVP, repeat every 5 min to max of 15 mg
        - For either medication hold if SBP <140 mmHg or DBP <80 mmHg or HR <60 BPM

# 2.14 EMERGENCY OBSTETRICS AND CHILDBIRTH

**Note:**

- EMS should be familiar with local hospital resources and local destinations for obstetric patients or patients suffering gynecologic emergencies
- For Patients who are pregnant, of greater than 20 weeks gestations, with a pregnancy related complaint, transport should be prioritized to the closest appropriate birthing hospital. This would include patients in labor without signs of imminent delivery
    - Signs of Imminent delivery may include:
        - Contractions < 5 minutes apart
        - Crowning
        - Urge to push/move bowels
- Pregnant patients when delivery is imminent, should be transported to the closest appropriate hospital when possible
- When estimating the fetal age in the resuscitation area, a rough guide might be that when the fundus of the uterus extends beyond the umbilicus, the fetus is potentially viable

| | |
|---|---|
| Data | PMH, Prenatal Care, Number of Previous Pregnancies, Deliveries, Last Menstrual Period, attempt to quantify maternal blood loss (if applicable) |
| Goals of Therapy | • Atraumatically deliver newborn with maintenance of appropriate hemodynamics for both mother and newborn |
| Monitoring | BP, HR, RR, frequency of contractions |

## EMERGENCY MEDICAL RESPONDER/EMT

- Notify receiving facility early on to allow preparation for patient arrival
- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ > 94%
- Administer high flow oxygen to any patient experiencing delivery complication
- Avoid supine position, Transport pregnant patients >20 weeks gestation on left side

**Cardiac Arrest Considerations in Pregnancy**

- The best chance for fetal survival is maternal survival
- Manage per cardiac arrest guidelines (defibrillation and medication should be administered for same indications and dosage as if non-pregnant patient)
- Displace Uterus from midline during chest compressions, the gravid uterus must remain displaced during transport
- Peri-mortem C-section has a high success rate for fetal survival is accomplished early. Rapid transport to an appropriate facility and/or activation of field physician resources, if available is critical

**Vomiting Considerations in Pregnancy**

- Use of **Zofran** use in pregnant/nursing mothers is acceptable if the patient is demonstrating signs of dehydration

**Trauma Considerations in Pregnancy**

- The fetus may be in grave danger following seemingly minimal maternal trauma, encourage transport and have a low threshold for transport to obstetrical center
- The gravid uterus, >20 weeks, should remain displaced during transport

**Normal Delivery Procedure**

- Evaluate for imminent delivery by visual inspection of the perineum for crowning
- If delivery appears imminent, apply sterile gloves, and drape
    - During contractions encourage patient to push

- Control rate of delivery of head using palm of your hand, applying gentle pressure to protect perineum
    - Do not allow sudden hyperextension of the neonate's head
- When head is delivered do not routinely suction airway
- If suction is needed:
    - Compress bulb suction device and place into mouth to suction mouth then repeat for nose
    - Limit suction to ten (10) seconds
    - Do not aggressively suction as this may stimulate bradycardia
- Check to see if cord is wrapped around baby's neck
    - If cord is loose, gently attempt to slip cord over the baby's head
    - If cord cannot be slipped over head or cord is tight around neck:
        - Clamp two sites on the cord and cut between clamps. Use of sterile scissors is preferred over scalpel
        - Deliver promptly
- Gently guide head and neck down to allow delivery of upper shoulder, then guide head and neck up to deliver lower shoulder and body, if difficulty noted follow Abnormal Delivery guidelines below
- Note time of delivery
- Place baby lower than placenta and assess cord pulsations
    - After pulsations have ceased, double clamp cord at approximately 6" and 9" from baby and sterilely cut between clamps
    - For vigorous single infants delay cord clamping 30-60 seconds
- If any signs of infant respiratory compromise, place in sniffing position. Continue to maintain an open airway and assess breathing rate and effort as well as tone
- After delivery, prevent heat loss by providing a warm environment, drying baby thoroughly, and covering infant head
    - If no resuscitation is needed place dry infant "skin to skin" on bare maternal chest and cover with blanket to keep warm
- Assess baby for *APGAR scoring* [See Neonatal Resuscitation Footnote [1] at 1 and 5 minutes after recorded time of birth
- See *Neonatal Resuscitation Guidelines* for further treatment if neonate

**Post-Partum Care of the mother**

- Evaluate mother post-delivery for evidence of shock due to excessive bleeding and continue to post-partum care of the mother below. See *Vaginal Bleeding after Delivery Guidelines*
- If perineum is torn/bleeding, apply direct pressure with gauze
- Do not hasten delivery of placenta but do not await delivery of placenta on scene
    - Do not pull on cord
    - Placenta may deliver spontaneously en route
    - Place placenta in clean basin or other container and transport with the patient
- After delivery, massaging the uterus (should be located at about the umbilicus) and allowing the infant to nurse will promote uterine contraction and help control bleeding
    - Attempt to quantify maternal blood loss
    - Treat mother per *Vaginal Bleeding after Delivery Guidelines*

**Abnormal Delivery**

- Proceed with emergent transport if able and administer high flow $O_2$ to all patients with conditions outlined below
- Breech Presentation
    - Coach the mother to perform shallow breathing and avoid pushing
    - If delivery is imminent, prepare the mother as usual and allow the buttocks and trunk to deliver spontaneously then support the body while the head is delivered
    - If needed, put the mother in a kneeling position which may assist in the delivery of the newborn
    - If the head does not deliver suffocation can occur
        - Place a gloved hand into the vagina, with your palm toward the baby's face
        - Form a "V" with your fingers on either side of the baby's nose and push the vaginal wall away from the baby's face to create airspace for breathing
- Prolapsed Umbilical Cord
    - Place mother in Left lateral Trendelenburg position, elevate hips, if possible or knee-chest position
    - Place gloved fingers into the vagina to manually displace presenting part off cord

    - Minimize handling of prolapsed cord to reduce vasospasm
    - Maintain until relieved by hospital staff
- Shoulder dystocia – if delivery fails to progress after head delivers, quickly attempt the following
    - Hyperflex mother's hips to severe supine knee-chest position
    - Apply firm suprapubic pressure to attempt to dislodge shoulder
    - Attempt to angle baby's head as posteriorly as possible but NEVER pull
- Limb presentation
    - The presentation of an arm or leg through the vagina is an indication for immediate transport to hospital

**AEMT**

- IV 0.9% NS Lock or KVO prior to delivery if time permits
- Initiate a 250 mL bolus for maternal dehydration, hypotension, or signs shock
    - See *Vaginal Bleeding after Delivery Guidelines*

**PARAMEDIC**

- If patient is hypertensive or experiences seizure, see *Eclampsia Guidelines*

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# *Medical Guidelines*

# 2.15 FEVER AND SEPSIS

**Note:**

- These guidelines do not apply to elevated temperature secondary to environmental exposures or ingestion, see Heat Emergencies and in *Toxic Exposure/Biologics/Overdose guideline*
- Patients with temperature >100.3°F or <96.8°F should be evaluated for sepsis if they exhibit any of the following potential sources of infection:
  - Pneumonia (cough/thick sputum, abnormal lung sounds)
  - Urinary tract infection (painful urination, hematuria, change in urination)
  - Blood stream/catheter/device related
  - Abdominal pain
  - Wound infection, cellulitis or skin/soft tissue infection
  - Central Nervous System (headache, altered mental status, stiff neck)
- **Adult Sepsis Screen**: If suspected or documented infection and two or more of the following criteria are met for non-pregnant adults: notify the receiving hospital with an "Adult Sepsis Alert" follow treatments below.
  - Hypotension - Systolic Blood Pressure <90 mmHg or MAP <65 mmHg
  - Altered mental status
  - Tachypnea - Respiratory rate >22 breaths/min (and/or $EtCO_2$ <25 mmHg)
- **Pediatric Sepsis Screen:** See Footnote (1)

| | |
|---|---|
| Data | Temperature, $SpO_2$, Blood Sugar, $EtCO_2$ ($EtCO_2$ of <25 mmHg may be a sign of poor perfusion), PMH including immunocompromised state(s) |
| Goals of Therapy | • Identify potential sepsis, initiate treatment<br>• Identify and treat hyperpyrexia<br>• Recognition of sepsis as a cause of hypotension and altered mental status<br>• Restore volume and support blood pressure, initiate vasopressors for those who are not responding to IV fluid<br>• Prevent the transmission of infectious processes |
| Monitoring | Skin perfusion, blood pressure, document IV Fluid Infused, provide early Sepsis Alert, closely monitor lung sounds while administering IV fluid |

## EMERGENCY MEDICAL RESPONDER

- Follow universal precautions
- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ >94%
- For hypotension, keep patient flat with lower extremities elevated (if possible)
- Check blood glucose and treat per *Diabetic Emergencies Guideline*
- For temperature >100.4°F , facilitate passive cooling by removing excess clothing and blankets
  - DO NOT cover patient with a wet towel or sheet
  - DO NOT apply ice or cold packs to the patient's body

## EMT

- If temperature >100.4°F
  - Consider **Acetaminophen** PO (PEDs dose 15 mg/kg) to a max of 1000 mg per dose - first line
    - Avoid if patient has taken Acetaminophen containing products within the last 6 hours
  - Consider **Ibuprofen** PO (PEDs >6 months old, dose 10 mg/kg) to a max of 400 mg per dose
    - Avoid if other NSAIDS (Ibuprofen, Ketorolac Naprosyn etc.) or Aspirin taken within the last 6 hours
    - Avoid NSAIDS if dehydrated, suspected bleeding or suspected shock
- Prior to administering Acetaminophen or Ibuprofen, assess temperature and provide to ED staff upon arrival

## AEMT

- IV/IO 0.9% NS/LR, consider 2nd point of vascular access

- Initiate **Fluid Bolus** for any patient having a positive Sepsis Screen. Note: IV fluids are indicated even in absence of hypotension
    - Adults – initial bolus 250 mL; reassess patient; repeat to max of 2 L or 30 mL/kg
    - Pediatrics – 20 mL/kg; reassess patients; repeat rapidly if indicated to max of 1 L or 60 mL/kg
        - For children <40 kg or not longer than length-based tape, consider hand pull/push method of fluid administration with a large syringe utilizing a 3 way stop cock
    - Neonate 10 mL/kg, repeat if indicated to max of 30 mL/kg
    - After each fluid bolus assess lung sounds. If new rales heard or patient producing frothy sputum with cough, avoid additional fluid bolus. Positive pressure ventilation may be needed
    - If multiple boluses needed, Lactated Ringers is the preferred solution
    - Document total fluids given and report to receiving facility
- If temperature >100.4ºF and unable to tolerate oral medications as above, Consider **Toradol** 15 mg IV/IM x1 (PEDS >1-year-old dose 0.5 mg/kg IV/IM x1, max dose 15 mg IV/IM)
    - Avoid if other NSAIDS (Ibuprofen, Naprosyn etc.) or Aspirin given within 6 hours
    - Avoid if dehydrated, suspected bleeding or suspected shock or hypotension

## PARAMEDIC

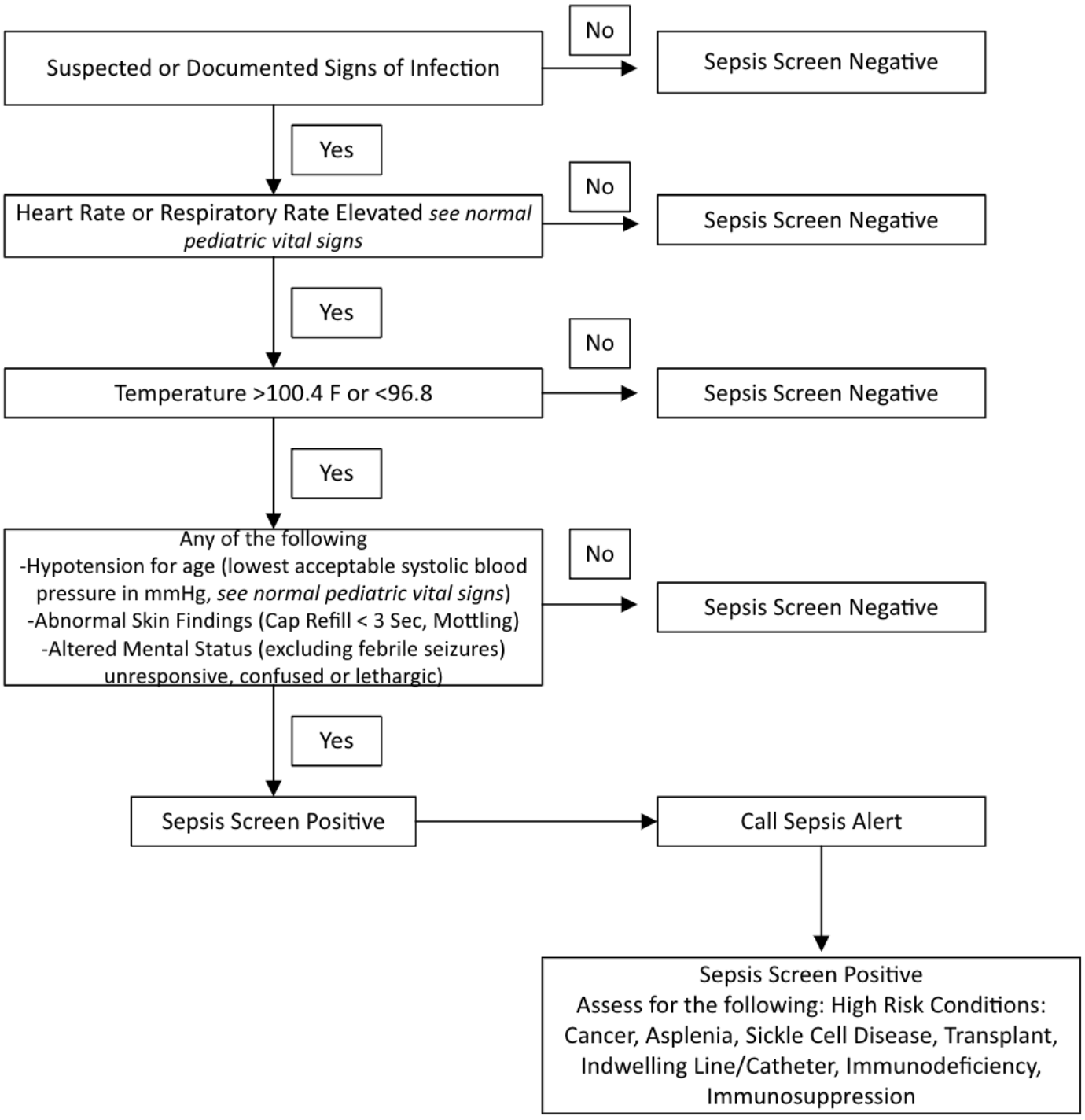
- Cardiac Monitoring
- Initiate vasopressors for shock unresponsive to multiple IV fluid boluses (continued hypotension despite at least 500 mL [PEDs 10 mL/kg] or impending cardiovascular collapse)
    - Goals of therapy:
        - Adult: Correction of hypotension (SBP <90 mmHg and/or MAP <65 mmHg)
        - Pediatric: Correction of hypotension for age (lowest acceptable systolic blood pressure in mmHg, see normal pediatric vital signs), Cap refill less than 3 seconds
- Adults **Norepinephrine (Levophed)** 2-20 mcg/min (PEDs 0.05-1 mcg/kg/min) IV/IO. Start at 5 mcg/min (PEDs 0.1 mcg/kg/min) IV/IO. Measure blood pressure and titrate by 2.5 mcg/min (PEDs 0.01 mcg/kg/min) increments every 5 minutes to maintain at BP targets

OR if above unavailable

- ***Push Dose Epinephrine or Drip*** per procedure section with goals of therapy as above
- If patient has a history of adrenal insufficiency, long-term steroid dependence and treatment of shock is requiring escalating vasopressors, consider **Solu-Medrol** 125mg IV (PEDS 2 mg/kg)

Foot Note: 1

## Pediatric Sepsis Screening Tool



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# *Medical Guidelines*

# 2.16 HEAT EMERGENCIES

**Note:**

- **Priorities for EMS Treatment of Heat Stroke: Cool First, Transport Second**
- Heat emergencies can occur in a variety of ambient temperatures and are most common in elderly patients, infants and young children, morbidly obese patients, athletes, and other patients with underlying health problems
- Heat stroke is a life-threatening neurological problem. The patient has an extremely high core temperature
- Initial assessment and aggressive cooling should be implemented based on clinical suspicion, regardless of the degree of hyperthermia or mode of measurement
- Many medications, illegal drugs and illnesses compromise body's ability to maintain appropriate temperature

| Problem | Cause | Possible Body Temperature | Clinical Findings and History |
|---|---|---|---|
| Heat Cramps | Dehydration Electrolyte imbalances | 99-101.3°F | Most common in children and athletes<br>Severe localized cramps in abdomen or extremities<br>Normal vital signs<br>Usually occur suddenly during or after strenuous physical activity |
| Heat Exhaustion | Inadequate fluid intake and excessive fluid loss | 99-104°F | **General:** fatigue, weakness, anxiety, headaches, sweating, nausea and vomiting, and limited to no urine output |
| Heat Stroke | Dangerous Core Temperature Elevation | >104°F | Altered mental status, decreased level of consciousness, seizures<br>Skin color temperature and moisture are not reliable findings, increased pulse and respirations, hypotension |

| | |
|---|---|
| Data | Temperature, $SpO_2$, Blood glucose, 12 Lead EKG |
| Goals of Therapy | • To recognize the patient with heat related illness and to provide and maintain adequate oxygenation/ventilation and tissue perfusion.<br>• End the heat challenge and rapidly cooling and increase heat loss from conduction, convection, radiation, and evaporation<br>• Replace fluid and electrolytes, orally when possible |
| Monitoring | Temperature $SpO_2$, Cardiac Monitoring |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline*
- End the heat challenge. Remove the patient from the hot environment into an area with shade, air conditioning, air movement, etc.
- Protect the patient from direct contact with hot surfaces, i.e., running track or asphalt road
- Remove excessive clothing
- Do not provide food or oral fluids if the patient has altered consciousness, nausea, vomiting, or is otherwise unable to control of his/her own airway
- Administer oxygen to keep $SpO_2$ > 94%, humidify if possible
- Begin rapid cooling in the prehospital setting as below if possible:
    - Cool water immersion provides the most rapid cooling but is technically difficult
    - Aggressively mist patient with tepid water and indirectly apply ice packs in neck, armpits, groin, cheeks, palms of hands, and soles of feet
    - Continue cooling en route to the hospital

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock. Reassess and repeat as indicate. Have a low threshold to initiate fluids for insensible losses
    - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guideline*

## PARAMEDIC

- To treat seizures, refer to *Seizure Guidelines*
- If shivering occurs which prevents cooling, consider **Versed** up to 2 mg (PEDs 0.05 mg/kg max 2 mg per dose) IV/IO/IN/IM may repeat x 1 in 5 minutes

# 2.17 HYPERTENSIVE EMERGENCY: ADULT

**Note:**

- Hypertension in an asymptomatic patient should not be treated prehospital. If the patient is hemodynamically and clinically stable, transport, observe and monitor as efforts to reduce the blood pressure will add little benefit.
- If patient presentation is suspicious for drug use, follow *Toxic Exposure/Biologics/Overdose guideline*.
- An elevated blood pressure measurement should be confirmed with measurements at least five minutes apart, and preferably at least one measurement should be manual.
- **Hypertensive emergency** in an adult can be defined as a severely elevated blood pressure (SBP > 220 or DBP > 120) with signs and/or symptoms suggesting end-organ dysfunction, which may include:
  - **Neurologic damage** due to hypertensive encephalopathy, stroke, subarachnoid hemorrhage, intracranial hemorrhage, etc. Assess for headache, visual disturbances, seizures, AMS, weakness, or paralysis.
  - **Cardiovascular damage** due to myocardial ischemia/infarction, LV dysfunction, acute pulmonary edema, aortic dissection, etc. Assess for chest pain, dyspnea, pulse deficits/asymmetry, rales, etc.
  - Other organ system dysfunction such as acute kidney failure or retinopathy
- These guidelines do **NOT** pertain to those patients with Pregnancy, Trauma or suspected Cushing's Reflex.

| | |
|---|---|
| Data | At least 2 blood pressure measurements, medications, PMH, Location of blood pressure, Blood Sugar if Diabetic or ALOC |
| Goals of Therapy | • To recognize the patient with a hypertensive emergency and provide and maintain adequate oxygenation/ventilation and tissue perfusion<br>• To decreased blood pressure by no more than 20% on the first hour<br>• To provide adequate blood pressure control and expeditious transport to the closest appropriate medical facility |
| Monitoring | 12 Lead EKG, Cardiac Monitoring and $SpO_2$ |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ >94%
- Transport sitting upright or with head of stretcher at 30 degrees
- If the patient is suspected to have suffered a stroke, follow the *Suspected Stroke Guideline*
- Follow *pain management guidelines* for pain that may be contributing to HTN prior to other antihypertensive therapies

## AEMT

- IV 0.9% NS Lock or KVO

## PARAMEDIC

- The goal of prehospital treatment for hypertensive emergency is to alleviate symptoms without reducing the blood pressure by more than 20% in the first hour:
  - Consider **Labetalol** 10mg IVP over 2 min. May repeat 20mg IVP every 10 min to a max of 100 mg
    - If Labetalol not available, Consider **Metoprolol** 5 mg IVP, repeat every 5 min to max of 15 mg
    - For either medication, hold if SBP <180 mmHg or DBP <100 mmHg or HR <60 BPM
  - Consider **Nitroglycerin Paste** 1" to chest, if not contraindicated
- For Pulmonary Edema follow *Congestive Heart Failure/Pulmonary Edema guideline*

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# *Medical Guidelines*

# 2.18 HYPOTHERMIA & FROSTBITE

**Note:**

- Many cases of accidental hypothermia encountered by EMS involve trauma, alcohol or drug abuse.
- Rough handling can precipitate ventricular fibrillation
- Check pulse and breathing for up to a full 60 seconds, as bradycardia and bradypnea are common in moderate to severe hypothermia
- Transport to a hospital capable of rewarming the patient
- A temperature should be obtained if possible. Otherwise, use clinical severity staging below

| Severity | Temperature | Clinical Findings |
|---|---|---|
| Mild | 90-95°F | Shivering, impaired judgment; Tachycardia and hypertension may be present |
| Moderate | 82-89°F | Confused to stuporous, shivering stops. Blood pressure becomes difficult to obtain |
| Severe | <82°F | Bradycardia, hypotension and slow respirations; Arrhythmias may develop; Consciousness is lost |

| | |
|---|---|
| Data | Temperature $SpO_2$, Blood glucose, 12 Lead EKG |
| Goals of Therapy | • Maintain hemodynamic stability, prevent rough handling which may precipitate arrhythmias<br>• Prevent further heat loss<br>• Rewarm the patient in a safe manner<br>• Prevent loss of limbs |
| Monitoring | Temperature, Cardiac Monitoring, $SpO_2$ |

## EMERGENCY MEDICAL RESPONDER/EMT

- Remove the patient from the cold environment if it can be done gently. Warm ambulance compartment and avoid repeated opening of doors
- Rough handling must be avoided as this may precipitate arrhythmias
- Do not attempt to rewarm frostbitten or frozen parts by rubbing them
- Remove wet clothing and gently dry the skin by patting, not rubbing, with dry towels
- Place blankets on top and underneath to insulate patients from cold ground; shield them from the cold wind
- Place hot packs in the axilla and groin with a barrier between hot pack and skin. Use warming blankets if available
    - In patients who are unresponsive, or unable to recognize a developing injury, check the area in which the heating pad is placed regularly to ensure no tissue damage occurs
- Administer oxygen to keep $SpO_2$ > 94%
    - If oxygen is deemed necessary, it should be warmed to a maximum temperature between 40°–42°C (104°–108°F) and humidified if possible [1]
- If there is a pulse, no matter how slow, do not initiate chest compressions
- If the patient is shivering and can swallow, support thermogenesis by giving the patient warm fluids and calories and consider administration of **Glucose Oral Gel**
    - Adult Dosing 25 g
    - **Pediatric** Dosing: 0.5–1 g/kg (max 25 g)
- If frozen limbs are fractured and angulated, splint in the position found. Do not attempt to straighten until they are completely thawed

**CARDIAC ARREST CONSIDERATIONS**

- If there is no pulse, initiate CPR and transport until directed by a physician to discontinue

- If the chest is frozen solid, or ice blocks the airway, CPR will be futile and should be discontinued (or never initiated) in the field, see *Termination/Withholding Of Resuscitation In The Field/Notification of Coroner*
- Apply an AED and analyze. If shocks are indicated, attempt defibrillation. The first shock should be given no matter what the core temperature
    - Do not delay defibrillation to measure a core temperature
    - Do not attempt to defibrillate more than once until the core temperature is > 86°F

## AEMT

- IV 0.9% NS Lock or KVO if indicated. [2]
- Initiate a 250 mL bolus (warmed IVF up to 104° F preferred for active warming) for severe hypothermia or signs of hypotension, hypovolemia, or shock, reassess and repeat bolus as indicated
    - PEDs Bolus 20 mL/kg, follow *Hypovolemia & Shock guideline*

## PARAMEDIC

- Apply continuous cardiac monitoring with frequent analysis of rhythm
- Consider endotracheal intubation, if the patient is unresponsive without a gag reflex
    - Administer warm humidified oxygen [1]
- Perform manual defibrillations as above. ACLS drugs should be withheld if the victim's core body temperature is <30°C (86°F). If the core body temperature is > 86°F, IV medications may be administered but at double or triple the dosing interval for all medications given, because hypothermia slows metabolism. Toxic levels can accumulate in the peripheral circulation during hypothermia
- Transcutaneous pacing for bradycardia should be withheld until the core temperature is > 86°F

## FOOTNOTES:

[1] Technique for warming and humidifying oxygen

- Place saline in a nebulizer
- Wrap a hot pack around the nebulizer
- Start oxygen flow
- Administer by mask
- If oxygen is deemed necessary, it should be warmed to a maximum temperature between 40°C (104) and humidified if possible

[2] Technique for warming IV Fluids in the field

- Use IV fluid warmer to maintain warm fluids is preferred, rotate stock frequently, follow manufacturer recommendations for temperature and rotation of fluids
- Place IV fluids in front of heating vents in vehicle while en route to call
- Wrap the IV tubing around a hot pack several times
- IV fluids, if administered should be warmed ideally to 104°F

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# *Medical Guidelines*

# 2.19 HYPOVOLEMIA & SHOCK

**Note:**

- Shock includes inadequate perfusion of vital organs, not merely hypotension. Clinical evidence of shock may include: altered mental status, delayed capillary refill (> 3 seconds), Decreased urine output, weak or decreased pulses, cool/mottled or flushed/ruddy skin
- Possible causes of hypovolemia and/or shock include:
  - Sepsis
  - Hemorrhage (Internal, External)
  - Spinal cord injury (Neurogenic Shock)
  - Cardiogenic Shock
  - Heart Rhythm Disturbances
  - Dehydration
  - Drugs and Toxins
  - Metabolic Disturbances
  - Anaphylaxis
  - Pulmonary Embolism
  - Anaphylaxis
- Avoid NSAIDS including Ibuprofen and Ketorolac in shock states.

| | |
|---|---|
| Data | $SpO_2$, 12-Lead EKG, Blood Sugar, $EtCO_2$ ($Etc0_2$ of <25 mmHg may be a sign of poor perfusion) |
| Goals of Therapy | • Recognition of shock state and underlying cause<br>• Maintain hemodynamics<br>• Restore volume and support blood pressure |
| Monitoring | IV Fluid Infused, Sepsis Alert Called, Vasopressors for those who are not responding to IV fluid |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline* and *Routine Trauma Guideline*
- Administer oxygen to keep $SpO_2$ >94%
- Keep patient flat with lower extremities elevated (if possible)
- Conserve body temperature, maintain warmth, and reassure patient

## AEMT

II. IV/IO 0.9% NS through large bore catheter, consider 2nd point of vascular access

**III. Goal of resuscitation:**

- Adult: Correction of hypotension (SBP <90 mmHg and/or MAP <65 mmHg), or signs of shock
- Pediatric: Correction of hypotension for age (lowest acceptable systolic blood pressure in mmHg, see normal pediatric vital signs) Cap refill less than 3 seconds
  - Less than 1 years of age: 60 mmHg
  - 1–10 years old: (age in years) (2) + 70 mmHg
  - Greater than 10 years old: 90 mmHg
- Initiate volume resuscitation for hypovolemia

**IV. Fluid Bolus**

- Adults usual dosing – 250 mL; reassess patient; repeat if indicated to max of 2 L or 30 mL/kg
- Pediatrics – 20 mL/kg; reassess patients; repeat rapidly if indicated to max of 1 L or 60 mL/kg
  - For children <40 kg or not longer than length-based tape, consider hand pull/push method of fluid administration with a large syringe utilizing a 3 way stop cock
- Neonate 10 mL/kg, repeat if indicated to max of 30 mL/kg

- After each fluid boluses assess lung sound. If rales heard or patient producing frothy sputum with cough, avoid additional fluid bolus. Positive pressure ventilation may be needed
- If large volume of fluid is anticipated, use Lactated Ringers as the preferred solution.

V. Document total fluids given and report to receiving facility

## PARAMEDIC

- Vasopressors for shock unresponsive to IV fluids) titrate to physiologic targets as above
- Adults **Norepinephrine** 2-20 mcg/min IV/IO. Start at 5mcg/min IV/IO. Measure blood pressure and titrate by 2.5mcg/min every 5 minutes
- Pediatrics **Norepinephrine (Levophed)** 0.05-1 mcg/kg/min IV. Start infusion at 0.1mcg/kg/min. Measure blood pressure and increase by 0.01mcg/min every 5 minutes
  - Preferred Cardiogenic, neurogenic and infectious (sepsis) causes of distributive shock if available
- ***Push Dose Epinephrine and Drip***
  - Preferred for bradycardia and anaphylactic shock
- If traumatic hemorrhagic shock, refer to *Routine Trauma Care*, for TXA indications and dosing
  - TXA not indicated in Gastrointestinal bleeding
  - If available, the administration of blood products may be indicated for hemorrhagic shock
- If patient has a history of adrenal insufficiency, long-term steroid dependence and treatment of shock is requiring escalating vasopressors, consider **Solu-Medrol** 125mg IV (PEDs 2 mg/kg)

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# *Medical Guidelines*

# 2.20 NAUSEA, VERTIGO, VOMITING

**Note:**

- Consider potential causes for nausea and vomiting prior to treatment:
  - Infectious diseases including food borne illness
  - Drug or alcohol intoxication
  - Adverse reaction to medication
  - Head injury
  - Diabetic problems
  - Heart problems (angina, AMI, CHF)
  - Hypotension
  - Abdominal Problems (bowel obstruction, pancreatitis)
  - Stroke
- Most patients complain about "dizziness". The provider must differentiate the spinning or falling feeling associated with vertigo from lightheadedness, which is another common reason for patients to complain of "dizziness" but should not be treated according to this guideline
- Extrapyramidal reactions: Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements
- Anticipate patient need for anti-emetic medication prior to transport in all patients who report motion sickness
- Anticipate that all patients have the potential for nausea if road conditions become extreme

| | |
|---|---|
| Data | Blood sugar, $SpO_2$, 12-Lead EKG |
| Goals of Therapy | • Maintain patent airway<br>• Stop vomiting, relieve nausea, correct dehydration |
| Monitoring | Response to interventions |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ > 94%
- Remove oxygen mask or CPAP if vomiting
- Have patient hold **alcohol pad** 2.5 cm from their nose and inhale up to 60 seconds. Stop if nausea resolves. If nausea persists or returns, may repeat up to 60 second inhalation every 2 minutes x2

## EMT

- If patient is over 35 years old, consider acquisition and transmission of 12-Lead EKG
  - If machine interpretation indicates "***ACUTE MI SUSPECTED***", call for ALS and refer to the *Chest Pain of Suspected Cardiac Origin Guidelines*

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, dehydration, or shock, reassess and repeat as indicated
  - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock Guideline*
- **Ondansetron (Zofran)** 4 mg IV/IM or ODT. May repeat x1 in 15 min. Pediatric patients with weight of 15 kg-26kg, **Ondansetron** 2 mg IM/IV, Pediatric patients with weight >27 kg 4 mg IM/IV

## PARAMEDIC

- Place patient on and perform continuous cardiac monitoring
- If extrapyramidal or dystonic, give **Diphenhydramine (Benadryl)** 50 mg IM or IV. Pediatric

1mg/kg IM or IV max dose of 50mg.

- Evaluate for other causes of nausea/vomiting and treat per guidelines.
- Adults: consider administration of **Droperidol** 1.25 mg IM (or IV slowly over 2 min) for acute nausea and vomiting refractory to Zofran, known history of cyclic vomiting syndrome or cannabis hyperemesis syndrome.

## FOOTNOTES:

- Side effects of **Droperidol and/or Zofran** include:
  - QT interval prolongation, torsades de pointes
  - Drowsiness
  - Hypotension
  - Headache
  - Blurred vision
  - Extrapyramidal effects including parkinsonism, involuntary muscle spasms, or repetitive movements

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# *Medical Guidelines*

# 2.21 NEONATAL RESUSCITATION

**Note:**

- Hypothermia is common in newborns and worsens outcomes of nearly all post-natal complications. Maintain warmth
- Anticipate need for additional resources
- Most newly born infants do not require immediate cord clamping or resuscitation and can be evaluated and monitored during skin-to-skin contact with their mothers after birth
- A rise in heart rate is the most important indicator of effective ventilation and response to resuscitative interventions

| | |
|---|---|
| Data | 30 Second intervals for Cardiopulmonary Assessment. Number of blood vessels on cord (3 is normal), Due date, Date and Time of Birth, Gestational Age, Meconium Present, Nuchal Cord, APGAR Score |
| Goals of Therapy | Resuscitate infant if >20 weeks gestational age, uncertainty of dates or signs of life. Consult with medical direction if considering withholding resuscitation.<br>Rapidly identify newly born infants requiring resuscitative efforts- poor tone, premature infants and those who are not crying should prompt immediate intervention |
| Monitoring | HR, RR, $SpO_2$, APGAR Score |

## EMERGENCY MEDICAL RESPONDER/EMT

- **Assess: Gestational Age, If Neonate is Breathing normally, Crying and Tone**
    - If immediate resuscitation is required and the newborn is still attached to the mother, double clamp cord at approximately 6” and 9” from baby and cut between clamps
- If immediate resuscitation is not needed in an uncomplicated delivery, place baby lower than placenta and assess cord pulsations
    - After pulsations have ceased, approximately 60 seconds, double clamp cord at approximately 6” and 9” from baby and cut between clamps
- **Dry, warm, and stimulate**
    - Place newborn in plastic bag/wrap to the level of the neck for or commercial chemical mattresses. Keep head covered
    - If above is unavailable wrap newborn in dry towel or thermal blanket to keep as warm as possible during resuscitation
        - If strong cry, regular respiratory effort, good tone, and term gestation, infant should be placed skin-to-skin with mother and covered with dry linen - routine suctioning in these situations is not recommended
        - If weak cry, signs of respiratory distress, poor tone, or preterm gestation then position airway (sniffing position) and suction mouth then nose
            - Compress bulb suction device and place into mouth to suction mouth then repeat for nose
            - Limit suction to ten (10) seconds do not aggressively suction as this may stimulate bradycardia
        - If Apnea or Gasping initiate Positive Pressure Ventilation via BVM
        - Monitor Sp02 on right upper extremity. For stable neonates, not requiring resuscitation, administer oxygen for levels below expected as below
            - Expected pulse oximetry readings following birth:
                1 minute = 60 - 65 %
                2 minutes = 65 – 70%
                3 minutes = 70 – 75 %
                4 minutes = 75 – 80 %
                5 minutes = 80 – 85 %
                10 minutes = 85 – 95%.
- **Assess Circulation**
    - **If heart rate greater than 100 BPM**

        - Monitor for central cyanosis provide oxygen as needed
        - If apneic, respiratory distress, labored breathing or persistent cyanosis:
            - **Ventilate**: BVM ventilation at 40–60 breaths with 100% oxygen. Reduce oxygen as able
    - **If heart rate less than 100 BPM**
        - **Ventilate**: BVM ventilation at 40–60 breaths per minute. With 100% oxygen, reduce as able.
            - Primary indicator of effective ventilation is improvement in heart rate
        - Evaluate heart rate every 30 seconds
    - **If heart rate <60 beats per minute**, despite stimulation and 30 seconds of positive pressure ventilation, begin CPR
        - The ratio of compressions to ventilations should be 3:1, with 90 compressions and 30 breaths to achieve approximately 120 events per minute.
- Positive Pressure Ventilation should be assessed with adequate chest rise and subsequent rise in heart rate. Corrective steps for positive pressure ventilations include:
    - Ensure Proper positioning with a towel or padding behind the neonates shoulders to place in sniffing position
    - Consider two handed technique
    - Readjust the mask and ensure proper sizing
    - Suction mouth and nose
- Consider airway adjuncts or supraglottic airway if above does not improve ventilation per *Routine Medical Care Guideline*
- Assess baby for APGAR scoring [1] at 1 and 5 minutes after recorded time of birth
- Check blood glucose post resuscitation if signs of altered responsiveness, any signs of hypoglycemia.
    - Initiate advanced response for blood glucose <45 mg/dL

## AEMT

- IV 0.9% NS lock
- Initiate a bolus of 10 mL/kg may repeat x1, *follow Hypovolemia & Shock guideline*
- Treat blood glucose <45 mg/dL with **Dextrose 10%** IV/IO, 2 mL/kg, recheck blood glucose following infusion

## PARAMEDIC

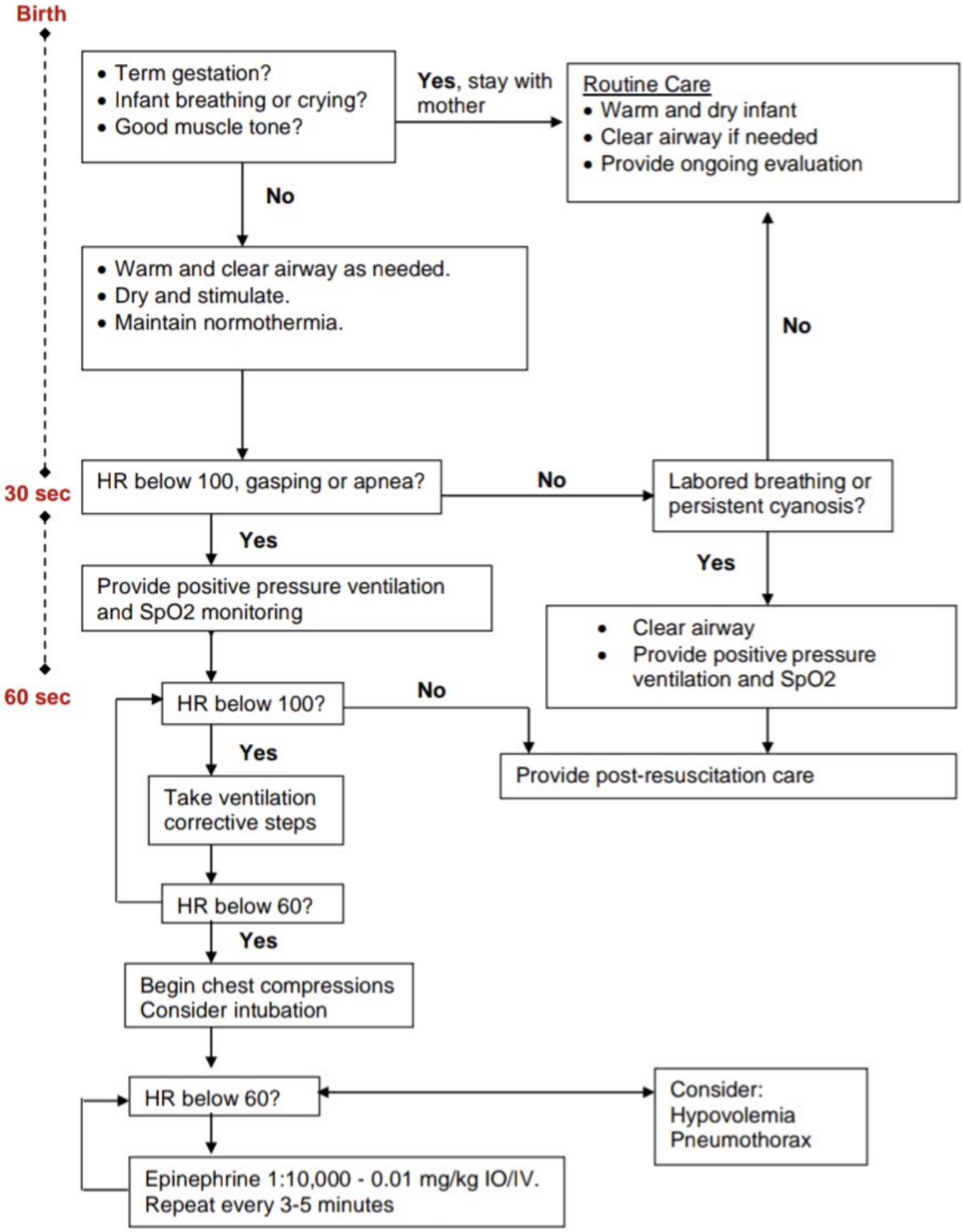
- Place on Cardiac Monitor for any neonate requiring resuscitation.
- Consider Intubation when above methods ineffective or not feasible when positive pressure ventilation is needed *per Respiratory Distress Guidelines*
    - Use of sedatives and paralytics to facilitate airway management is generally not indicated in neonatal population
- For HR <60 despite ventilations and stimulation above
    - Administer **Epinephrine** (1 mg / 10 mL) 0.01 mg/kg IV/IO (preferable if access obtained) or 0.1 mg/kg via the ETT (if unable to obtain vascular access) q 3–5 min if heart rate remains less than 60 BPM
- Consider pneumothorax – treat per *Chest Decompression Guidelines*

## FOOTNOTES:

[1] APGAR Scores are performed at 1 minute and 5 minutes after birth according to the following table:

| SCORE | 0 | 1 | 2 |
|---|---|---|---|
| APPEARANCE | Blue/pale | Pink Body/Blue Extremities | Pink |
| PULSE | Absent | Slow (< 100/minute) | > 100/minute |
| GRIMACE | No response to suction | Grimace to suction | Cough or Sneeze to suction |
| ACTIVITY | Limp | Some Flexion | Active Motion |
| RESPIRATIONS | Absent | Slow/Irregular | Good/Crying |

## Neonatal Resuscitation



# 2.22 PAIN MANAGEMENT

**Notes:**

- Use of non-invasive capnography provides earlier indication of hypoventilation than pulse oximetry
- All patients who receive controlled substances require transport to the hospital at the ALS/ILS level

| | |
|---|---|
| Data | Pain score on a 0-10 scale or mild moderate, severe, Pediatric consider using Wong-Baker FACES scale [1], reassessment documentation, $SpO_2$ |
| Goals of Therapy | To provide pain relief in a safe and compassionate manner |
| Monitoring | BP, HR, RR, EKG, $SpO_2$., Etc02, pain reassessment |

## EMERGENCY MEDICAL RESPONDER

- Acknowledge and assess the patient's pain by obtaining a thorough history and rating
- Administer oxygen to keep $SpO_2$ > 94%
- Identify and treat the cause of pain if possible
- Reassure and comfort the patient; Use a calm and soothing voice
- Distract them or encourage them not to focus on their injury
- Eliminate stress inducing distractions—i.e. family, police and bystanders
- Coach the patient's breathing—calm, deep full inhalations, and relaxed slow exhalations
- Explain to the patient what is happening and what will happen next
- Adjust the ambient temperature of the treatment area to a comfortable level for the patient
- Attempt non-pharmacological interventions (positioning, splinting, ice, etc.)
- Document interventions and response, reassess pain after all interventions

## EMT

- Consider **Acetaminophen** PO (Pediatrics: Dose 15 mg/kg) to a max of 1000 mg per dose
    - Avoid if patient has taken or received Acetaminophen containing products within the last 6 hours
- Consider **Ibuprofen** PO (Pediatrics: >6 months old, Dose 10mg/kg) to a max of 400 mg per dose
    - Avoid if other NSAIDS (Ibuprofen, Toradol, Naproxen, etc.) or Aspirin received within the last 6 hours
    - Avoid if dehydrated, suspected bleeding or signs of shock

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated.
    - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guideline*
- Consider **Toradol** 15 mg IV/IM x1 (PEDS > 1y/o dose 0.5 mg/kg IV/IM x1, max dose 15mg IV/IM) for pain as an alternative for opioid or for pain from gallstones or kidney stones
    - Avoid if other NSAIDS (Ibuprofen, Naprosyn etc.) or Aspirin administered within 6 hours
    - Avoid if dehydrated, suspected bleeding or signs of shock

## PARAMEDIC

- For moderate to severe pain consider additional/other medications as below
- Reduce opioid pain medication dose by 50% in elderly or smaller framed patients
- Administer opioids with caution to patients with altered mental status, hypotension, hypoxia ($SpO_2$ less than 94%), or signs of hypoventilation
- For opioid pain doses: start dose low – slowly increase –titrate to effect up to listed dose

- **Fentanyl Citrate** up to 50-100 mcg IV/IM/IO/IN per dose may not exceed 100 mcg in 10 minutes. Repeat in 10 minutes if indicated-max dose of 200 mcg. Pediatric dose 1mcg/kg IV/IO or 2 mcg/kg IN max dose 100 mcg per bolus repeat x 1 in 10 minutes if indicated
    - Intranasal routes of opioid analgesia are preferred as the initial dosing route in pediatrics where IV access may be problematic; consider in other patient populations when an IV is not otherwise indicated

**Or**

- **Dilaudid** up to 0.5-1 mg IV/IO/IM, may not exceed 1 mg in 20 minutes. If indicated, repeat in 20 min-max total dose 3 mg (Adults Only)
- Consider low dose **Ketamine** for severe pain unresponsive to Opioids - 0.25 mg/kg IV/IM (Adults Only) max dose 25 mg repeat x 1 in 20 min if indicated
- Consider high dose **Ketamine** when extreme pain dissociation is indicated with obvious severe traumatic injuries or per **Medical Direction**, 1 mg/kg **SLOW** IV (max dose 100 mg) or 4 mg/kg IM (Adults Only) max dose 400 mg
- Reassess patient's pain before any additional dose
- Recheck blood pressure before each additional dose, opioids can cause hypotension
- Do not withhold pain meds from someone in pain if indicated. Assessment at hospital can be done even after pain meds are given
- For additional dosing or intervals, contact **medical direction**

**FOOTNOTES:**

[1] Wong-Baker FACES scale

# 2.23 PATIENTS WITH ESTABLISHED TRACHEOSTOMY OR VENTILATOR

**Note:**

- Patients with an established use of a ventilator outside of a hospital/healthcare facility setting may be transported at any EMS provider level. In most cases, the patient should remain on the ventilator and accompanied by an experienced caregiver comfortable with and willing to manage the ventilator
- Patients with a tracheostomy and/or chronic ventilator are prone to conditions such as infections, bed sores, blood clots, dehydration, and/or chronic pain. They often have additional chronic conditions and other impairments to their sensory systems, mobility, and/or dependency on other special devices, see *Special Needs Populations Guideline*
- Caring for patients with a stoma or tracheostomy may present a significant risk of bodily fluid exposure; providers should take airborne, droplet, and contact isolation precautions to include protection of their eyes and mucous membranes as indicated
- Irritation and infection of a stoma site can occur due to buildup of mucus or rubbing of a tracheostomy tube against the skin, causing tenderness, redness, foul odor, and/or drainage to occur
- A tracheostomy tube can be displaced into a false passage (usually in the pre-tracheal space) at any time, presenting a potentially life-threating situation
- Patients with tracheostomy tubes or stomas should not be intubated orally unless other airway measures are ineffective to maintain adequate oxygenation/ventilation
- Be familiar with the most common parts of a tracheostomy setup

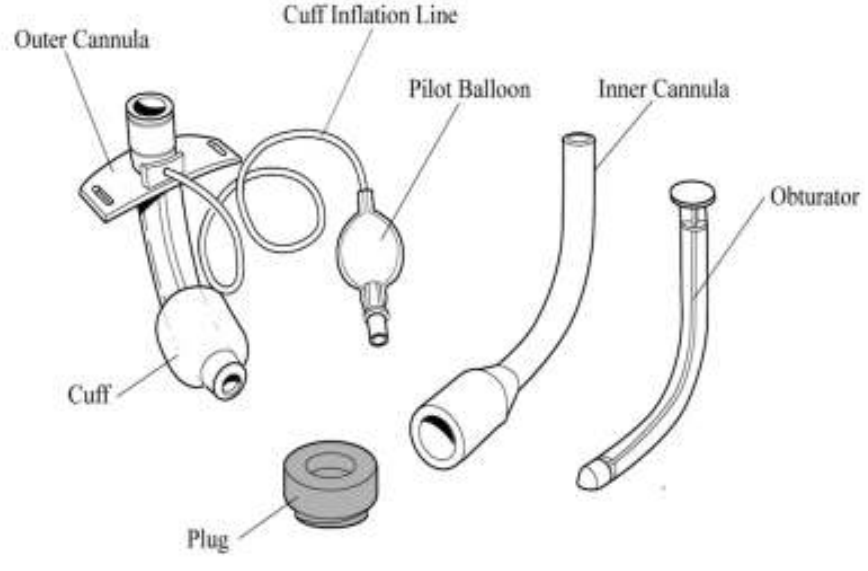



*Photo source: https://www.aliem.com/*

- Respiratory arrest is the most common cause of cardiac arrest in the pediatric patient
- Severe hypoxia is a common cause of bradycardia and should be immediately addressed with aggressive airway management prior to the consideration of using cardiac drugs
- The hallmark of upper airway obstruction is inspiratory stridor, which may be caused by conditions such as a lodged foreign body, croup, tracheitis, diphtheria, abscess, or trauma, refer to *respiratory distress guideline*

| | |
|---|---|
| Data | Baseline, $SpO_2$, $EtCO_2$, Type/Size/Manufacturer of medical device |
| Goals of Therapy | Secure airway, clear secretions, optimize oxygenation and ventilation, improve patient comfort level and work of breathing |
| Monitoring | $SpO_2$, $EtCO_2$, ventilation status, responsiveness |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline* and *Routine Trauma Guideline*
- Allow/assist the patient to assume a position of comfort, especially if demonstrating tripoding or movement worsens their respiratory status. Do not force pediatric patients to lay supine
- Ventilated patients: If patient is having any respiratory distress or issues with proper function or alarming of ventilator, consider removing patient from ventilator and assisting breathing with gentle synchronous ventilations using bag-valve mask; Support ventilation with BVM if apnea or hypopnea occurs
- Tracheostomy patients: treat hypoxia or shortness of breath first by attempting to provide oxygen via trach collar at 5-15 LPM or per non-rebreather at 12-15 LPM. Patients with a tracheostomy often have patent upper airways and can therefore also be oxygenated via oral or nasal route
- Assess tracheostomy site for any misplaced or obstructed tubes, fullness of pilot balloon, bleeding, inflammation, infection, or foreign body. Deflating the tracheostomy cuff may relieve a partial obstruction
- If speaking cap or valve is present over tracheostomy, remove it
- If inner cannula present, remove and rinse with a few mL of normal saline to help remove any potential debris contributing to an obstruction
- If unable to ventilate through an open trach, cover opening and ventilate with bag-valve mask over mouth and nose (consider using a smaller/pediatric bag-valve mask even on adult patients)
- *Very important: some tracheostomy brands require replacement of inner cannula to safely and effectively ventilate with bag-valve mask or ventilator circuit*
- Never attempt to reinsert a dislodged tracheostomy tube. Trying to do so may cause a false channel in the subcutaneous tissue anterior to the trachea preventing appropriate ventilation
- Any inhaled medications should be given via the stoma or tracheostomy tube, rather than mouth
- Assess patient for any upper respiratory (obstruction/stridor, congestion, infection, bleeding) or lower respiratory (pneumothorax, aspiration, pneumonia, asthma, COPD) condition, see *Respiratory Distress Guideline*
- Provide suctioning of upper airway as needed
- The mnemonic **DOPES** can help you remember the most common causes of hypoxia or deterioration while on mechanical ventilation:
    - **D**isplacement
    - **O**bstruction
    - **P**neumothorax
    - **E**quipment failure
    - **S**tacked breaths
- If anaphylaxis is suspected, see *Allergy & Anaphylaxis Guideline*
- If wheezing or bronchospastic disease is suspected, consider **Albuterol Sulfate** indicated, see *Asthma/COPD Guideline*

## EMT

- Provide oral rigid or soft deep/tracheobronchial suctioning of tracheostomy or other advanced airway, as needed, to clear secretions. Soft suction catheter should be rinsed with a few mL of **Normal Saline** for lubrication and to establish patency of the catheter. Suction attempts should be no longer than 10 seconds. Insert no more than ¾ length of neck. If unable to suction because of thick secretions, instill 2-3 mL of **Normal Saline**, then re-attempt to suction
- Monitor $EtCO_2$ (Capnography) if possible to assess ventilatory status, confirm advanced airway placement and monitor treatment effectiveness, see *$EtCO_2$ (Capnography) Monitoring Procedure*
- If wheezing or bronchospastic disease is suspected, consider **Albuterol Sulfate** and **Ipratropium Bromide (Atrovent)** as indicated, see *Asthma/COPD Guideline*
- Confirm airway and effective ventilations per *Routine Medical Care Guideline*

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated.
    - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guideline*

## PARAMEDIC

- Patients with tracheostomy tubes or stomas should not be intubated orally unless other airway measures are ineffective to maintain adequate oxygenation/ventilation
- Consider intubation of stoma for patients in respiratory failure with hypoventilation or persistent hypoxia on high-flow oxygen, see *Respiratory Distress Guideline*
- If a mature tracheostomy tube is not able to be made effective as above, remove tube and try to insert an endotracheal tube of same approximate size in diameter over a bougie to depth of no more than ½ the length of ET tube, Do NOT use a rigid stylet, inflate ETT cuff and confirm placement via $EtCO_2$ waveform, chest rise, and auscultation of lung sounds. If unable to find tracheostomy opening due to bleeding, thread suction catheter through an endotracheal tube and use catheter tip to probe opening, sliding tube over catheter into opening and then removing catheter. Attempt to ventilate and confirm as above
- Ventilators may only be adjusted by paramedics with approval from medical director after completion of specific training. See *Ventilators* Practical Sections
- For severe anxiety, in absence of severe hypoxia, consider low dose **Ketamine** 0.25 mg/kg (25 mg max bolus) IV/IO/IM, **Fentanyl** up to 1 mcg/kg (100 mcg max bolus) IV/IO/IN/IM, or **Versed** 0.1 mg/kg (2 mg max bolus) IV/IO/IN/IM to help relax or improve compliance with assisted ventilations
- If severe uncontrolled bleeding, within 3 hours of onset, consider TXA 30 mg/kg (up to 2 g max bolus) IV/IO over 20 minutes
- Additional resource: Emergency Tracheostomy Algorithm, provided by the National Tracheostomy Safety Project in the UK, which is available for free download at: *http://www.tracheostomy.org.uk/storage/files/Patent%20Airway%20Algorithm.pdf*

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# *Medical Guidelines*

# 2.24 POST-ROSC CARE

**Note:**

- Consider the cause of the arrest, if known, and provide treatment of the underlying condition. If the cause was not known, consider the "Hs and Ts" of reversible causes of cardiac arrest
- If, at any point, the patient loses pulses, return to management per the *Cardiac Arrest guidelines*

| | |
|---|---|
| Data | 12-lead ECG, course of resuscitation including medications given and interventions performed, underlying condition (if known), signs of perfusion including skin parameters and mental status |
| Goals of Therapy | Maximize hemodynamics and oxygenation/ventilation to prevent further neurologic or other vital organ injury or recurrence of cardiac arrest |
| Monitoring | Continuous cardiac monitoring, pulse oximetry, $EtCO_2$, frequent blood pressure monitoring |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline* / Trauma Care
- Obtain 12-lead ECG if not already done
    - If STEMI is identified on the post-ROSC ECG, treat per the *Chest Pain of Suspected Cardiac Origin* guidelines, and initiate transport to a cardiac catheterization capable center, with a STEMI alert as operationally feasible
- If patient has inadequate ventilations, provide ventilations with bag-valve-mask device and 100% oxygen
    - Consider placement of supraglottic airway if no gag reflex is present
    - Suction airway if secretions are present
- If patient is adequately ventilating, apply oxygen via non-rebreather or nasal cannula to maintain $SpO_2$ >94%
- Check fingerstick blood glucose, and treat hypoglycemia per the *Diabetic Emergencies* guidelines

## AEMT

- Initiate IV or IO access, if not already done
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*

## PARAMEDIC

- If the 12-lead ECG shows signs of hyperkalemia, or if the patient's history is concerning for hyperkalemia (i.e. end-stage renal disease on dialysis, crush injury, burn more than 24 hours ago), treat per the *Cardiac Arrest* Guidelines
- If patient is requiring assisted ventilations, consider endotracheal intubation, if not already performed
    - Follow the *Respiratory Distress* Guidelines
    - For RSA credentialed providers, **ketamine** is contraindicated for patients with cardiac ischemia. Consider etomidate in such cases
- If a patient remains unconscious but is breathing spontaneously, provide oxygenation and ventilatory support per the *Respiratory Distress* guidelines with goal of normocapnia.
- For patients who are intubated and decompensate, assess for the "DOPES" mnemonic: Dislodgement, Obstruction, Pneumothorax, Equipment Failure, Stacked Breaths
    - Continuous waveform capnography is the gold standard for ensuring maintained advanced airway placement. Absence of waveform indicates dislodgement and requires immediate correction

- If the patient is hypotensive, consider and correct any underlying cause (tension pneumothorax, cardiac tamponade), and provide IV fluid boluses cautiously with frequent reassessment
- Maintain SBP >90 mmHg (or age-appropriate for pediatrics), consider **Norepinephrine (Levophed) or** ***Push Dose Epinephrine or Epinephrine Drip*** in setting of shock not amenable to fluid boluses
    - **Norepinephrine (Levophed)** 2-20 mcg/min IV/IO (PEDs 0.05-0.1 mcg/kg/min IV, titrated to effect up to max of 2 mcg/kg/min)
- If an adult patient experienced any ventricular arrhythmia during the cardiac arrest, but did not receive amiodarone during the resuscitation, administer **Amiodarone** 300 mg IV/IO over 20 minutes
- For patients who have a confirmed and well-functioning advanced airway placed during the cardiac arrest, continue mechanical ventilation, and consider sedation for patients with reaction to painful/noxious stimuli or spontaneous movement with minimum blood pressures per *Shock* "goals of resuscitation"
    - Sedation must be managed carefully, with a balance between hemodynamic stability and cardio protection. If questions regarding post arrest sedation exist, contact medical direction
    - Administer below medications to goal *IMCRASS* of -4 (Choose either Ketamine and Fentanyl and Versed)
    - **Ketamine** 1mg/kg IV/IO (max 100mg per dose) as initial dose. Repeat 0.5-1mg/kg as needed to maintain dissociation.
        - May increase heart rate and blood pressure, which may increase myocardial oxygen demand. Additionally, in patients with depleted catecholamine stores, ketamine can cause decreased inotropy, worsening hypotension. Therefore, it is contraindicated in patients with cardiac decompensation (e.g. STEMI)

      **OR**
    - **Fentanyl** up to 50-100 mcg IV/IO per dose may not exceed 100 mcg in 10 minutes. Repeat in 10 minutes if indicated-max dose of 200 mcg. Pediatric dose 1mcg/kg IV/IO 100 mcg per bolus repeat x 1 in 10 minutes if indicated
        - May have less effect on hemodynamics or myocardial oxygen demand but provides potent analgesia. May use in combination with a **Versed** as hemodynamics allow
    - **Versed** consider titrating up to 2 mg (PEDs 0.05 mg/kg max 2 mg per dose) IV/IO/IN/IM per dose, every 5 minutes as needed
        - May cause significant decrease in blood pressure

*Mercyhealth System*

# *Medical Guidelines*

# 2.25 RESPIRATORY DISTRESS

**Note:**

- This guideline may apply to the following conditions:
  - Congestive Heart Failure (CHF)
  - Burns/Inhalational Injury
  - Asthma/COPD/Bronchospasm/Reactive Airway Disease
  - Allergy/Anaphylaxis
  - Pulmonary Infections
  - Pulmonary Edema
  - Pneumothorax
  - Upper Airway Obstruction
  - Anxiety and Hyperventilation Syndrome
  - Acute Coronary Syndromes
  - Toxic Exposure/Overdose

| | |
|---|---|
| Data | $EtCO_2$ with waveform, $SpO_2$, on room air or home $O_2$<br>EKG, if an acute coronary syndrome is suspected<br>Blood Sugar, if DKA is suspected or if there is ALOC |
| Goals of Therapy | Improve oxygenation and ventilation, reduce the work of breathing, and treat underlying conditions |
| Monitoring | $SpO_2$ frequently, and $EtCO_2$ continuously, cardiac rhythm, vitals |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline* and *Routine Trauma Guideline*
- Allow/assist the patient to assume a position of comfort (usually upright)
  - For pediatric patients consider placement of towel(s) behind shoulders
- Administer oxygen to keep $SpO_2$ >94%
- If ventilations are inadequate, assist breathing with gentle synchronous ventilations with bag-valve mask (BVM) and 100% Oxygen; Support ventilation with 100% Oxygen if apnea or hypopnea occurs
- If an opioid narcotic overdose is suspected, consider **Naloxone (Narcan)** 0.5 mg up to 2 mg IN (max 1 ml per nostril) or IM (EMT and above only) per dose (ped dose 0.1mg/kg) up to 2mg per dose to increase the respirations. Using smaller doses of Narcan is recommended, as the goal is only to increase respirations, not fully awaken patient. Repeat dose as necessary based on patient's respiratory effort. Refer to *Toxic Exposure/Overdose Guidelines*
- If choking and concerns for partial airway obstruction, encourage patient to continue spontaneous coughing and breathing efforts. Do not interfere with the patient's own attempts to relieve the obstruction
- If choking and concerns for complete airway obstruction, clear airway, utilize suction as indicated
  - Foreign Body in a conscious patient
    - Adult/Pediatric Patients: Abdominal thrusts (use chest thrusts in pregnant and obese patients) or chest thrusts if abdominal thrusts are not effective
    - Infants: Five back slaps and five chest thrusts
  - Foreign Body in an unconscious patient
    - Lower victim to the floor. Begin chest compressions. Before airway maneuvers, look into the mouth. If you see a foreign body that can easily be removed, remove it
- If there is altered level of consciousness but gag reflex present, consider placement of an appropriately sized nasopharyngeal airway
- If patient is unresponsive with no gag reflex, consider oropharyngeal airway or supraglottic airway device

- If patient becomes responsive or does not tolerate airway, remove advanced airway with patient in recovery position and suction oropharynx if needed

- Confirm all advanced airways and document with an $EtCO_2$ (Capnometry [EMR/EMT] or Capnography [EMT/Paramedic]) and the following:
  - Lung Auscultation
  - Absence of gastric sounds
  - Bilateral chest rise
- If anaphylaxis is suspected, see *Allergy & Anaphylaxis Guideline*
- **Albuterol Sulfate** for Asthma, COPD Reactive Airways Disease and Bronchospasm, see *Asthma/COPD Guideline*

## EMT

- Monitor $EtCO_2$ (if available) to assess ventilatory status, confirm advanced airway placement and monitor treatment effectiveness, see *$EtCO_2$ (Capnography) Monitoring Procedure*
  - If $EtCO_2$ and advanced airway is in place ventilate and generally attempt to maintain a reading between 35-45 mmHg
- Consider CPAP if patient mental status and vital signs allow Refer to *CPAP Procedure*
- Consider the following medications
  - **Albuterol Sulfate** with **Ipratropium Bromide (Atrovent)** is indicated for Asthma Reactive Airways Disease and Bronchospasm and COPD, see *Asthma/COPD Guideline*
  - **Aspirin** and assisting with patient's prescribed **Nitroglycerine** are indicated for patients with angina, see *Chest Pain of Suspected Cardiac Origin Guideline*

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
  - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guideline*
- If rales heard or patient producing frothy sputum with cough, avoid additional fluid bolus. Positive pressure ventilation may be needed

## PARAMEDIC

- If patient is showing signs of CHF, see *Congestive Heart Failure/Pulmonary Edema Guideline*
- If foreign body and BLS measures fails, proceed to Magill Forceps and Laryngoscopy for purposes of removing foreign body
- If a tension pneumothorax is suspected, perform needle decompression on the affected side. See *Chest Decompression*
- Stridor (Including pediatric croup) due to suspected inflammatory or infectious process
  - Administer to patients with signs of stridor at rest or anaphylaxis with respiratory distress not responsive to IV/IO epinephrine:
    - Pediatric:
      - 1 mL of **Epinephrine 1 mg / 1 mL** mixed with 2 mL of normal saline in pediatric nebulizer connected to oxygen source at 6 LPM
    - Adult:
      - 0.3 mg (3 mL of **Epinephrine 1 mg / 10 mL**) in adult nebulizer connected to oxygen source at 6 LPM

      or
      - **Racemic epinephrine** 0.5 mL of 2.25% solution mixed in 2.5 mL NS in adult nebulizer connected to oxygen source at 6 LPM
    - Humidified oxygen or mist therapy is **not** indicated for croup
- Endotracheal Intubation
  - Non-RSA intubations are restricted to patients with no gag reflex who require airway management. Paramedics performing non-RSA intubations should use the below guidelines for airway management, may not sedate or paralyze to facilitate intubation unless RSA credentialed

        - Pediatric patients - consider intubation when other measures ineffective
    - For paramedics credentialed to perform RSA, please see *Rapid Sequence Airway*
    - Confirm all advanced airway and effective ventilations with $EtCO_2$, document value and import waveform to ePCR if possible
    - Direct visualization and bougie confirmation are additional acceptable confirmation in addition to capnography and the above methods
    - For intubated patient consider placement naso/orogastric tube for gastric decompression if trained and time allows unless contraindicated by facial trauma or concern skull fracture or other contraindications
    - Services using *ventilators* will require ventilator-specific training
    - Monitor closely for signs of pneumothorax, treat as indicated. See *Chest Decompression Guideline*
    - Utilize PEEP if needed to maintain oxygen saturations, monitor blood pressure. See *PEEP guideline*
    - The mnemonic **DOPES** can help you remember the most common causes of post-intubation hypoxia or deterioration
        - **D**isplacement
        - **O**bstruction
        - **P**neumothorax
        - **E**quipment failure
        - **S**tacked breaths
    - Removing the ETT in the field
        - In general, an ETT should not be removed in the field unless the below indications are met:
        - The patient wakes up, can maintain their own airway, and medical indication for intubation has been resolved
        - The ETT is not performing adequately
        - Procedure for removing an ETT
            - Place the patient in the recovery position (left side)
            - Deflate cuff and remove tube
            - Be prepared to suction the pharynx
- Difficult Airway Procedure [2]
    - If rescuer cannot intubate the trachea after one attempt, a second attempt at intubation may be attempted. Ventilate and ensure good oxygenation between attempts. If the patient is unable to be ventilated or is hypoxic proceed directly to a supraglottic airway. Utilize bougie [3], alternative visualization device, or additional bedside provider to maximize chance of success
    - **Failed Intubation:** If the second attempt to intubate is unsuccessful, proceed immediately to a supraglottic airway
    - If the Supraglottic airway fails, consider the following options if unable to oxygenate or ventilate via any other means:
        - Consider a surgical airway, bougie cricothyroidotomy [age >12 y/o], transtracheal jet ventilation, or medical director approved commercial device

## FOOTNOTES:

[1] Severity of Respiratory Distress:

- Mild = RR <20 + minimal additional breathing effort + speaking in complete sentences + minimal subjective distress, No ALOC
- Moderate = RR 20 to 25 + moderate additional breathing effort + difficult to complete a sentence + moderate subjective distress + No ALOC
- Severe = RR> 25 + marked additional breathing effort + 2- or 3-word sentences + marked subjective distress + possible ALOC

[2] For the purposes of endotracheal intubation, one “attempt” is counted when the laryngoscope is placed in the mouth, even if there has not been an attempt to pass the tube

[3] Adult Bougie recommended for a 6.0 ETT and larger. Pediatric Bougie for a 4.0 to 5.5 ETT

# 2.26 ROUTINE MEDICAL CARE

| | |
|---|---|
| Data | Follow specific guideline. Consider $SpO_2$, Blood Sugar, EKG, $EtCO_2$<br>• All patients shall receive an assessment and examination to identify abnormalities and/or injuries and these shall be documented<br>• All patients will be assessed for pain<br>• All patients will be reassessed after each intervention and medication administration and their response will be documented |
| Goals of Therapy | • To provide guidelines for emergent care and expeditious transport to the closest appropriate facility of the medical patient in order to minimize morbidity and mortality of patient outcomes |
| Monitoring | • Follow specific guideline<br>• The frequency of vital sign monitoring should be determined by patient condition<br>• All patients will be monitored for comfort and warmth |

## NORMAL PEDIATRIC VITAL SIGNS

| AGE | HR Beats/min | RR Breaths/min | BP (sys) mmHg |
|---|---|---|---|
| Newborn | 100 – 180 | 30 - 60 | >60 |
| 3 – 12 months | 110 - 160 | 30 - 60 | >70 |
| 2 years | 90 – 150 | 24 – 40 | >74 |
| 4 years | 90 – 150 | 22 – 34 | >78 |
| 6 years | 70 – 120 | 18 – 30 | >82 |
| 8 years | 70 – 120 | 18 – 30 | >86 |
| 10 years | 70 – 120 | 18 – 30 | >90 |
| 12 years | 60 – 110 | 12 - 16 | >94 |

Table from Illinois Emergency Medical Services for Pediatrics Surge Pocket Guide-Used with permission.

Lowest normal pediatric systolic blood pressure by age:

- Less than one month: > 60 mmHg
- One month to 1 year: > 70 mmHg
- Greater than 1 year: 70 + 2 x age in years

## EMERGENCY MEDICAL RESPONDER

- Ensure **Scene Safety** and Body Substance Isolation (BSI) as indicated
- Request Advanced Life Support (ALS) and other additional resources as needed

- Assess level of consciousness and manage according to *Altered Level of Consciousness Guideline*
- Airway Management – Perform the following, if indicated:
    - Open the Airway with head-tilt chin lift OR modified jaw thrust if unconscious and suspected trauma
    - Insert oropharyngeal or nasopharyngeal airway as indicated and no contraindications
    - Manage Foreign Body Airway Obstruction per Respiratory Distress guidelines.
    - Suction airway as needed
    - If there is loss of consciousness, and no gag reflex or other contraindications consider insertion of a supraglottic airway, refer to *Respiratory Distress Guideline*
    - Confirm all advanced airways and document with $EtCO_2$ (Capnometry [EMR/EMT] or Capnography [EMT/Paramedic]) and the following:
        - Lung Auscultation
        - Absence of gastric sounds
        - Bi-lateral chest rise
- Breathing Management: Provide and/or Support oxygenation and ventilation. Perform the following as indicated:
    - Check pulse oximetry ($SpO_2$)
    - Titrate oxygen administration to keep $SpO_2$ > 94%, if unable to assess $SpO_2$ consider administration of high flow oxygen
        - Use a nasal cannula at 1 – 6 LPM or Non-rebreather mask at 12 – 15 LPM (depending on the apparent severity of respiratory distress)
    - If spontaneous breathing is present with compromise or patent is not breathing provide
    - ventilatory support. Ventilate or assist ventilations with a bag-valve-mask connected to high-flow oxygen
        - Consider utilization of PEEP. See *PEEP Guidelines*
    - Mechanical Ventilations Rates for patients with a pulse
        - Adults: 1 Breath every 6 seconds
        - Pediatrics: 1 Breath Every 3 Seconds
    - Consider Albuterol and/or epinephrine; See *Asthma/COPD Guideline* and *Allergy & Anaphylaxis Guideline*
- Circulation Management – Perform the following, if indicated:
    - Assess pulse rate and quality
    - Cardiopulmonary resuscitation (CPR) and defibrillation per and *Cardiac Arrest Guideline*
    - Warm and place the patient in Trendelenburg Position as indicated; see *Hypovolemia & Shock Guideline*
- After checking ABCs, correct any immediate life threats, if indicated:
    - Assess for and treat hypoglycemia per *Diabetic Emergencies Guideline*
- Obtain History
- Obtain Vital Signs
    - Blood Pressure (BP), Heart Rate (HR), Respiratory Rate (RR), and Pulse Oximetry ($SpO_2$). Obtain a body temperature using a digital thermometer, if available
- Perform a focused physical exam
- Treat pain if present. Refer to *Pain Management Guideline*
- Consider contacting online medical direction for orders to administer a **medication the patient is prescribed** but not within the scope of your *Approved Medication List* in situations where receiving the medication is perceived to be time-sensitive and significantly beneficial. Online medical direction may choose to allow the provider to administer the medication so long as the route of administration is within that provider's scope of practice.

## EMT

- Airway Management – Perform the following, if indicated:
    - Use Magill forceps and laryngoscopy to remove foreign bodies
- Breathing Management – Perform the following, if indicated:

- $EtCO_2$ monitoring
  - If signs of bronchoconstriction may administer or assist patient with Albuterol and Atrovent nebulized unit doses; See *Asthma/COPD Guideline* and *Allergy & Anaphylaxis Guideline*

- After checking ABCs, correct any immediate life threats, if indicated:
  - May use Epinephrine for anaphylaxis; see *Allergy & Anaphylaxis Guideline*
  - Check blood glucose if there is an altered level of consciousness (ALOC); see *Altered Level of Consciousness Guideline* and *Diabetic Emergencies Guideline*
- Initiate additional treatments as directed in specific guidelines
- Initiate Advanced level upgrade as needed
- Transport secured in the position of comfort unless contraindicated
- Perform 12 Lead EKG as indicated and transmit to receiving hospital
- Treat fever per *Fever and Sepsis Guideline*

## AEMT

- Circulation Management
  - Attempt to obtain adequate vascular access. Normal saline infusion or locks are indicated for patients who require potential or immediate fluid/volume replacement and/or medication administration prior to hospital arrival
    - Consider additional IV/IO access for critical or potentially critical patients.
    - If patient condition warrants or IV access unsuccessful, establish IO access, see *EZ-IO Placement*
    - For dialysis patients, IV placement should be on the opposite of dialysis fistula/graft, for post mastectomy patients, IV placement should be on opposite side
    - Lower extremity IV sites are contraindicated in patients with vascular disease or diabetes.
    - Access site preferred above diaphragm in pregnant patients when uterine fundus above the umbilicus
  - Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guideline*
  - For all renal failure patients reduce bolus doses by ½
- Infusion flow rates should be based on patient condition

## PARAMEDIC

- Airway Management – Perform the following, if indicated:
  - Intubation per *Respiratory Distress Guideline*
  - Perform a *cricothyroidotomy* (surgical/needle) if an upper airway obstruction cannot be relieved by non-invasive means and unable to oxygenate and ventilate patient
  - RSA; see *Respiratory Distress Guidelines*
- Breathing Management – Perform the following, if indicated:
  - Needle decompression of a tension pneumothorax; see *Chest Decompression Procedure*
- Circulation Management- Perform the following if indicated
  - Consider scene resources for field blood transfusion
  - If unresponsive to fluid bolus or otherwise indicated consider vasopressors per *Hypovolemia & Shock*
- After checking ABCs, correct any immediate life threats and, if indicated:
  - Perform cardiac rhythm monitoring, 12-Lead EKGs, and treat any dysrhythmias per appropriate guidelines
  - Synchronized Cardioversion in unstable patients; see *Tachycardia Guidelines*
  - Transcutaneous Pacing in unstable patients; see *Bradycardia Guideline*
  - Defibrillation per *Cardiac Arrest Guideline*

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# *Medical Guidelines*

# 2.27 ROUTINE TRAUMA CARE

**Note:**

- This guideline may be used as a for trauma in both adults and pediatrics. Follow appropriate guideline and/or procedure for specific trauma care
- Do not delay transport. Preform skills during transport as able

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| Data | Blood Glucose, $SpO_2$, EKG, $EtCO_2$, GCS, Adult/Pediatric Trauma Score |
| Goals of Therapy | • Maintain ABC's<br>• Identify and treat life threatening conditions.<br>• Restore adequate respiratory and circulatory conditions<br>• Reduce pain, morbidity and mortality<br>• Expeditious transport to an appropriate facility |
| Monitoring | $SpO_2$, Cardiac monitoring, $EtCO_2$, repeat vitals |

## EMERGENCY MEDICAL RESPONDER

- Ensure Scene Safety and Body Substance Isolation (BSI) as indicated
- Determine need for additional resources for extrication and transport
- C-Spine: Manual stabilization, apply c-collar or use alternative method if collar does not fit
- Stop hemorrhage (note this is not exclusive to traumatic hemorrhage)
    - Direct pressure is the primary method of controlling *most* external bleeding and should be used as soon as possible. May be used in conjunction with pressure points and extremity elevation as applicable to control bleeding
    - Hemostatic Agent Indication: Severe external hemorrhage unable to be controlled by usual measures
        - Remove any previous applied bandages and wipe away as much excess blood/liquid in wound area as possible. Non-exothermic hemostatic-impregnated dressings should be applied followed by at least 3 minutes of direct pressure.
    - Bleeding from the torso or junctional wounds including the neck, shoulder/axilla, and groin can be controlled by direct pressure, by packing the wound, and/or by placing an approved junctional tourniquet (axilla or groin only)
        - Wound packing is contraindicated for chest, head, abdomen, and dialysis graft bleeding
    - Consider commercially approved **tourniquets** immediately for massive/arterial extremity bleeding or promptly when other methods do not control the extremity bleeding
        - Apply 2-3 inches proximal to wound
        - Placing a tourniquet as proximal and as tight as possible on the injured extremity ("high and tight" method) should be limited to circumstances where it is difficult or unsafe to determine the exact source of bleeding
        - Place on bare skin is preferred whenever possible. Do not place over the elbow, wrist, knee, or ankle joints
        - Ensure that all slack is removed before tightening the windlass to avoid bunching and twisting
        - Tighten and secure per manufacturers' instructions:
            - The tourniquet is effectively applied when there is cessation of bleeding from the injured extremity and any pre-existing distal pulse should be absent
        - Note the time the tourniquet was applied and record this time on the patient or tourniquet
        - Do not remove any tourniquet without authorization from Medical Direction
        - Appropriate tourniquet application will be painful, initiate advanced level intercept
    - If one tourniquet is not sufficient to control bleeding, consider a second tourniquet proximal to the first
    - To maintain effectiveness of hemorrhage control, re-assess the wound and tourniquet following any patient movement (e.g., ground to stretcher, stretcher to ambulance) and during transport to ensure continued adequate hemostasis

- Airway - Perform the following if indicated:
    - If there is loss of consciousness, insert an oropharyngeal, nasopharyngeal, or advanced airway depending on presence of gag reflex, refer to *Respiratory Distress Guidelines*
    - Use modified jaw thrust for unconscious patient
    - Nasopharyngeal airway is contraindicated in midface trauma
    - Suction airway as indicated
    - Manage Foreign Body Airway Obstruction per *Routine Medical Care Guideline*
    - If patient is unresponsive, utilize approved appropriately sized supraglottic airway device.
        - Confirm all advanced airways and document with an $EtCO_2$ (Capnometry [EMR/EMT] or Capnography [EMT/Paramedic]) and the following:
            - Lung Auscultation
            - Absence of gastric sounds
            - Bi-lateral chest rise
- Breathing Management – Perform the following, if indicated:
    - Check pulse oximetry ($SpO_2$)
        - Administer oxygen to keep $SpO_2$ > 94% if unable to assess $SpO_2$ consider administration of high flow oxygen
            - Use a nasal cannula at 1 – 6 LPM or Non-rebreather mask at 12 – 15 LPM
            - Consider application of supplemental oxygenation for all patients with suspected Traumatic Brain Injury
    - Ventilate or assist ventilations with a bag-valve-mask connected to high-flow oxygen
    - Utilize PEEP as indicated
    - Cover sucking chest wounds with an approved commercial vented chest seal or an occlusive dressing (i.e. defibrillator pad), seal all 4 sides of dressing, lift as needed to vent any developing tension pneumothorax. Monitor hemodynamics closely
- Circulation:
    - Assess pulse rate and quality
    - If the patient arrests follow *Cardiac Arrest Guidelines*
        - CPR should not be attempted if:
            - There are other injured survivors with emergent needs for help
            - Obvious signs of death per *Termination/Withholding of Resuscitation in the Field/Notification of Coroner*
    - Prevent and treat *hypothermia*- Keep the patient warm and protected from rain/snow, ambulance exhaust, etc.
- Perform initial neurologic status assessment of GCS/AVPU (**A**lert, **V**erbal, **P**ainful, **U**nconscious) and pupillary size and responsiveness
    - Assess for gross motor movement of extremities
    - If there is ALOC Check Blood Glucose and treat per *Diabetic Emergencies Guideline*
- Treat patient's pain, refer to *Pain Management Guidelines*
- Consider requesting MD-1 response for potential use of ***Ertapenem*** antibiotic in cases of grossly contaminated injuries.

**Initial Care for Specific Conditions:**

- **Amputation care**
    - Control bleeding as above
    - Bring all amputated parts to hospital with patient if possible
        - Wrap amputated part in moist sterile dressings and place in waterproof bag
        - Place waterproof bag on ice or cold packs
- **Avulsions/Degloving**
    - Control bleeding as above

    - Do not replace flap or loose skin, handle gently to avoid further injury
    - Cover loose skin with saline-soaked sterile dressings
    - Recover tissue if possible, transport per amputation care

- **Crush Injuries**
    - Leave gloves or shoes on crushed extremity unless hemorrhaging and direct wound care is necessary
    - Tourniquets should be used only to treat life-threatening bleeding and should not be routinely placed to prevent crush syndrome
- **Eviscerations**
    - Do not place organs back into body
    - Cover in saline-soaked sterile dressings, keep patient and organs warm (avoid thermal injuries)
- **Impaled Objects**
    - Do not remove impaled object unless directly impairing airway, it may be slowing any underlying bleeding
    - Secure the object with bulky dressings to prevent additional movement and injury
- **Dental Injuries**
    - Placed avulsed tooth in saline or milk if available. Avoid touching the root
- **Epistaxis**
    - Protect airway, have patient lean forward
    - Squeeze bridge of nose (or have patient do so) for 10-15 minutes continuously with pressure directed as high as possible
- **Eye injuries** - Coach patient not to rub eyes
    - If applicable ask patient to remove contact lenses
    - Chemical Splash/Burn/Foreign Body
        - Thoroughly and continuously irrigate affected eye(s) using copious amounts of LR or saline
        - Remove superficial, non-impacted foreign bodies from the eyelids. Do not attempt to remove any intraocular foreign bodies
        - If riot control/noxious agent were utilized and commercially produced wipes are available, utilize these per manufacturer recommendations
    - Penetrating Injury/Ruptured Globe/Corneal Abrasion
        - Stabilize any penetrating object
        - Avoid all pressure on injured eye. Cover injured eye with cup or metal/plastic protective patch and also cover the uninjured eye
        - If globe is avulsed or enucleated, do not put back into socket. Cover eye socket with moist saline dressings and then place eye shield over it
        - Shade the patient's face/eyes from light
- **Head Injuries**
    - Consider application of supplemental oxygenation for all patients with suspected Traumatic Brain Injury
    - Elevate head of bed unless hypotensive or otherwise contraindicated
    - Avoid hypotension- Initiate Advanced Level Intercept if hypotensive
    - Evaluate for clinical signs of traumatic brain injury with herniation including:
        - Unequal pupils
        - Lateralizing motor signs
        - Posturing
    - Ventilation strategies should target eucapnia ($EtCO_2$ 35-40 mmHg) avoid prolonged hyper and hypocapnia
        - In patients with severe head injury with signs of herniation, modest hyperventilation to $EtCO_2$ no less than 30 mmHg may be considered for a brief time
- **Musculoskeletal injuries**:
    - Assess distal pulses, sensation and motion of injured extremity in initial position. Reassess circulation, sensation and motion after any movement of or splint application to extremity
    - If distal vascular function is compromised, gently attempt to restore normal anatomic position once, and reassess perfusion status. Be cautious to not aggravate injury or increase pain

- Attempt to reposition (not reduce) dislocated joints to improve comfort, circulation and sensation
- Apply a well-padded splint that immobilizes the long bone above and below the injury or the joint above and below the injury
  - Immobilize joints in mid-range position
  - Do not compromise distal circulation
  - Elevate the injured extremity if no fracture or dislocation is suspected
  - Consider application of a compression bandage or ace wrap if a splint is not needed
- If backboard is needed to help immobilize long bone fractures, move patients, or in unique extrication scenarios:
  - Pad the backboard with a blanket(s) as needed
  - Pad voids between the patient and backboard—behind knees, and small of back as needed
  - Pad the straps as needed
- Apply ice or cold packs to the injured area as indicated, do not apply directly to bare skin
- Dress open wounds associated with fractures with saline-moistened gauze
- Use pelvic wrap or approved commercial pelvic binder for crepitus/movement on exam/suspected adult pelvic fracture and concern for major hemorrhage. See *Pelvic Binder Guideline*
  - Consider placement of a pelvic binder on all patients with blunt or blast trauma suffering traumatic arrest with known or suspected pelvic injury

## EMT

- Airway Management – Perform the following, if indicated:
  - Use Magill forceps and laryngoscopy to remove foreign bodies
- Perform *Selective Spinal Motion Restriction* per procedure
- Transport patient restrained in the position of comfort unless contraindicated by necessary Spinal Motion Restriction as above
- Perform 12 Lead EKG as indicated for concerns of blunt cardiac injury and transmit to receiving hospital

## AEMT

- Attempt to obtain adequate vascular access. IV access is indicated for patients who require immediate or potential fluid/volume replacement and/or medication administration prior to hospital arrival
  - Consider additional IV/IO for critical or potentially critical patients
  - If patient condition warrants and IV access unsuccessful, establish IO access, see *EZ-IO Placement*
  - For dialysis patients, IV placement should be in opposite arm of dialysis fistula/graft, for post mastectomy patients, IV placement should be in opposite side
  - Lower extremity IV sites are contraindicated in patients with vascular disease or diabetes
  - Access site preferred above diaphragm in pregnant patients when uterine fundus above the umbilicus
- In hemorrhaging adults without closed head injury and who are not pregnant, practice permission hypotension and maintain SBP of at least 90 mmHg
  - Permissive hypotension is not indicated in pediatric and pregnant patients, follow *Routine Medical Care Guideline* for IV fluid boluses
- In adult patients with closed traumatic brain injuries attempt to maintain SBP >110 mmHg
- For adults initiate a 250 mL Saline/LR bolus for SBP minimums as listed above, hypovolemia, or shock, reassess and repeat as indicated
- If available, hang blood tubing with Normal Saline in applicable patients to expedite transfusion
  Infusion flow rates shoulder be based on patient condition

## PARAMEDIC

- Airway Management – perform the following, if indicated:
    - Intubation per *Respiratory Distress Guideline*
    - Perform a *cricothyroidotomy* (surgical/needle) if an upper airway obstruction cannot be relieved by non-invasive means
    - Rapid Sequence Airway Indications:
        - Respiratory failure with hypoventilation or persistent hypoxia despite use of high-flow oxygen
        - Severe head injury: Glasgow Coma Scale <8
        - Agitation/combativeness that jeopardizes the well-being of the patient or the safety of crew
        - Inability to protect the upper airway due to loss of gag reflex or ALOC
        - Threat of imminent airway compromise due to:
            - Massive facial injuries
            - Hemorrhaging into or around the airway
            - Expanding neck hematoma or penetrating injuries of the neck
- Breathing Management – Perform the following, if indicated
    - Needle decompression of a tension pneumothorax; see *Chest Decompression Procedure*
- Circulation Management- Preform the following if indicated
    - Perform cardiac rhythm monitoring, 12-Lead EKGs, and treat any dysrhythmias per appropriate guidelines
    - Consider early request for scene resources for field blood product transfusion
    - Consider bilateral needle decompression, pelvic binder and pericardiocentesis for adult traumatic arrest as guided by exam
- Consider sedation for combative injured patients without capacity, refer to *Agitated & Combative Guidelines*
- Traumatic Hemorrhagic Shock: Signs include sustained tachycardia despite pain control/sedation, hypotension, clinical signs/symptoms of shock, appropriate tourniquet use for massive hemorrhage, or suspected internal bleeding. If patient is assessed within 3 hours of injury, consider TXA as follows:
    - Over 12 years old: **TXA** 2 g IV/IO over 20 minutes. Hang blood tubing
    - Under 12 years old: **TXA** 30 mg/kg (maximum dose 2 g) IV/IO over 20 minutes. Hang blood tubing
    - LR is not compatible with blood transfusion and a secondary IV access with blood tubing and NS or flushing the line with NS would be required
- Traumatic Brain Injury
    - Adults with TBI within 3 hours of injury and Glasgow Coma Scale (GCS) score of 12 or lower
    - Over 12 years old: **TXA** 2 g IV/IO over 20 minutes
    - Under 12 years old: **TXA** 30 mg/kg (maximum dose 2 g) IV/IO over 20 minutes
- Adult Crush Injury: If crushed greater than 30 minutes assume crush syndrome may be present and consider treatment
    - Add 50 mEq **Sodium Bicarbonate** per liter of NS and initiate 500 mL/hr infusion and attempt to administer 1 L bolus of this fluid just prior to extrication
    - If suspicion for hyperkalemia as evident by peaked T-waves, Prolonged QRS (greater than 0.12 seconds), absent P wave, prolonged QTc, cardiovascular collapse, ventricular irritability or sine wave, or when cardiac monitoring not feasible
        - Consider **Calcium Chloride** 20 mg/kg (max 1,000 mg bolus) and 1 mEq/kg **Sodium Bicarbonate** (max 50 mEq bolus) **SLOW** IV/IO
        - Flush IV line thoroughly between medications or administer through separate IV sites as Calcium Chloride and Sodium Bicarbonate are not compatible
        - **Albuterol** 10 mg via nebulizer as a temporizing measure, adjunct to the above or if no vascular access
- Pediatric Crush Injury greater than 30 minutes assume crush syndrome may be present and consider treatment
    - Calcium Chloride and Sodium Bicarbonate are not compatible
    - Pediatrics use 1 mEq/kg **Sodium Bicarbonate** in the NS infusion, infuse at
        - 10 kg: 4 mL/kg/hr

        - 10-20 kg: 40 mL/hr plus 2 mL/kg/hr for each kg between 10-20 kg
        - >20 kg: 60 mL/hr plus 1 mL/kg/hr for each kg above 20 kg
        - Attempt bolus of 20 mL/kg of above solution just prior to extrication
    - Consider **Calcium Chloride SLOW** 20 mg/kg (max 500 mg bolus) and 1 mEq/kg **Sodium Bicarbonate** (max 50 mEq bolus) **SLOW** IV/IO for peaked T-waves, Prolonged QRS (greater than 0.09 seconds), absent P wave, prolonged QTc, cardiovascular collapse, ventricular irritability or sine wave, or when cardiac monitoring not feasible
    - Consider **Albuterol:** for patients less than 1 year old 2.5 mg, for patients older than 1 year old 5 mg via nebulizer as a temporizing measure, adjunct to the above or if no vascular access
- **Open wounds associated with fractures**:
    - Administer ***Ancef*** 2 grams (PEDS dose 30 mg/kg) as IVP diluted in 5ml sterile water over 3-5min or infusion in 100ml NS over 15-30min
- Eye injuries:
    - Consider Tetracaine 2 drops/eye, may repeat every 5-10 minutes, max 3 doses.
    - If irrigation indicated, *Morgan Lenses* may facilitate irrigation utilizing NS or LR

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# *Medical Guidelines*

# 2.28 SEIZURE/STATUS EPILEPTICUS

**Note:**

- Seizures due to trauma, eclampsia, hyperthermia, or toxic exposure should be managed according to those condition-specific guidelines [1]
- Search and treat for underlying cause of seizure especially if no history of epilepsy
- If the patient is more than 20 weeks pregnant, refer to the *Eclampsia Guidelines*
- Status epilepticus is an emergency and is defined as a seizure with 5 minutes or more of continuous seizure activity or recurrent seizure activity without recovery between seizures and requires prompt treatment
- Pseudoseizure is an older term for events that appear to be epileptic seizures but, do not represent the manifestation of abnormal excessive synchronous cortical activity, which defines epileptic seizures. They are not a variation of epilepsy but are of psychiatric origin. The most current terminology is psychogenic nonepileptic seizures (PNES). Careful assessment may reveal telltale clues [2]

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| Data | Blood Glucose, $SpO_2$, Temperature, Duration of Seizure, EKG particularly for first onset seizures, Medications administered prior to EMS arrival |
| Goals of Therapy | • Prompt cessation of seizure<br>• Ensure adequate oxygenation and ventilation<br>• Treat the underlying cause, including fever in children |
| Monitoring | Vitals, Cardiac monitoring, $SpO_2$, $EtCO_2$ |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline* and *Routine Trauma Guideline*
- Seizure precautions including protect the patient with ongoing seizures from harming themselves by clearing away potential hazards and placing a pillow or padding under the head, avoiding CNS stimulation such as, bright lights and loud sounds
- Administer oxygen to keep $SpO_2$ > 94%
- Ventilate or assist ventilations with a bag-valve-mask connected to high-flow oxygen as indicated
- Obtain blood glucose. If <70 mg/dL refer to *Diabetic Emergencies Guideline*
- Consider oropharyngeal, nasopharyngeal, or supraglottic airway, if the patient is unable to maintain a patent airway
- Minimize CNS and external stimulation – avoid sirens, bright lights and loud music if possible

## EMT

- Consider acquisition and transmission of a 12-lead EKG following cessation of seizure in patients without a history of seizures to determine possible cardiac cause
- For pediatric seizure associated with fever:
    - Treat fever, per *Fever & Sepsis Guideline*, when the seizure has terminated and child can tolerate PO medication
    - Report temperature and any antipyretics given to the receiving facility

## AEMT

- IV 0.9% NS Lock
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guideline*

**PARAMEDIC**

- If the patient is still seizing,
    - If IV/IO already established: give **Versed** 0.1 mg/kg IV/IO (max 5 mg bolus)
    - Otherwise preferred: **Versed** 0.2 mg/kg IM (max 10 mg bolus)
    - Alternative route: Versed 0.2 mg/kg IN (max 1ml per nare)
- If seizures persist, repeat doses of Versed every 10 min until seizures stop or stores exhausted. Maximum total all doses: **Versed** 20 mg, unless medical direction approves order for additional doses
- If there is need for RSA to secure airway, once the patient is paralyzed, muscular convulsions will cease, but occult CNS seizure activity may persist. Therefore, repeat doses of **Versed** every 10 minutes under the assumption of ongoing seizure and provide hemodynamic support if hypotension develops

## FOOTNOTES:

[1] The causes of seizures include but are not limited to: fever in children up to approximately 6 months to 6 years, epilepsy, eclampsia, hypoglycemia, hypoxia, drug or alcohol withdrawal, drug overdose, stroke and head trauma

[2] Characteristics of psychogenic nonepileptic seizures are listed below:

- Identifiable trigger (emotional stress, crisis or grief)
- The patient usually has an audience
- Asynchronous or asymmetric motion during the seizure (“bicycling” or head turning)
- Mid-range and reactive pupils during the convulsion (they’re widely dilated in an epileptic seizure)
- Lack of tongue biting or incontinence
- Apparent purposeful movements
- Remaining conscious, or even speaking, during the convulsion

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# *Medical Guidelines*

# 2.29 SPECIAL NEEDS POPULATIONS

**Notes:** Be aware of the following:

- Agencies and individual providers encounter a variety of individuals who require service. A portion of those individuals may have disabilities. Therefore, all personnel need to ensure compliance with federal regulations (American Disabilities Act - ADA, Emergency Medical Treatment and Active Labor Act –EMTALA, and State Statutes) that require non-discriminatory access/ services to individuals who have special needs
- Caring for patients and understanding their rights is the responsibility of providers of the EMS system
- Identify the patient's needs by gather information from the patient, the patient's family, bystanders, medic alert bracelets or documents, or the patient's adjunct assistance devices
- Attempt to identify the patient's normal baseline vital signs
- Communication Barriers:
    - Language Barriers/Non-English Speakers
        - If possible, consider the use of the following:
            - Online/Phone certified translation services
                - RockCom may be able to assist with arranging an interpreter, call (815) 968-0993 for assistance
            - Medical translation cards
        - If above unavailable, consider transporting an individual who is fluent in the patient's language with the patient
    - Any written communication between the patient and the EMS provider may become part of the medical record and should be retained with the storage and confidentiality policies and procedures that are applicable to the written or electronic patient report
    - It may be desirable to obtain secondary confirmation of pertinent data (e.g., allergies) from the patient's family, interpreters, or available written information
- Sensory Barriers include visual impairment, auditory impairment and cognitive impairments
- Mobility Barriers:
    - Ambulatory Impairments
    - Neuromuscular impairments
    - Patients with Down Syndrome, especially children, may have upper cervical instability and may be more prone to spinal cord injury. Consider spinal restriction in any mechanism of injury where there has been significant movement of the neck
    - If a caregiver is present, ask if there is a "best way" to move the patient
- Assistance Adjuncts See *Special Needs Devices* , for further information
    - Device examples include, but are not limited to:
        - Extremity prostheses
        - Hearing aids
        - Tracheostomy
        - Central Intravenous Catheters
        - CSF Shunt
        - Gastrostomy Tube (G-Tube or J-Tube)
        - Colostomy or Ileostomy
        - Ureterostomy or Nephrostomy Tube (or Foley Catheter)
    - Consider utilizing patient's medical equipment/supplies and for optimal results and appropriate sizing
    - Use parents/caregivers/home health nurse as a medical resource at home and during transport

- **Service Animals**
    - Individual agencies should develop and follow policies on transportation of service animals. The following should serve as a guide and is not intended to be all-encompassing
    - As defined by the ADA, a service animal is individually trained to do work or perform tasks for the benefit of an individual with a disability, including a physical, sensory, psychiatric, intellectual, or other mental disability. The work or tasks performed by a service animal must be directly related to the individual's disability
        - Examples of work or tasks include, but are not limited to, assisting individuals who are blind or have low vision with navigation, alerting individuals who are deaf or hard of hearing to the presence of people or sounds, pulling a wheelchair, and retrieving items such as medicine or the telephone
    - EMS must be prepared to safely transport service animals alongside their handlers
    - An entity may ask an individual with a disability to remove a service animal if:
        - Excessive/repeatedly barking without a reasonable relationship to the individual – i.e. seizure alert, safety hazard
        - Displaying vicious behavior toward responders or bystanders
        - The animal is out of control and the animal's handler does not or cannot take effective action to control it
        - The animal is not housebroken
    - EMS Personnel may only ask the patient if the service animal is required because of a disability and the form of assistance the animal has been trained to perform.
        - Service animals are not required to wear a vest or a leash
        - EMS clinicians are not responsible for the care of the service animal. If the patient is incapacitated and cannot personally care for the service animal, a decision can be made whether to transport the animal in this situation.
        - Animals that solely provide emotional support, comfort, or companionship do not qualify as service animals
- **Police Dogs**: According to *WI Stat § 256.155 (2019)*: EMS providers may render any first aid service to a domestic animal before the domestic animal is transferred to a veterinarian for further treatment if the service is in the scope of practice of the license or certification of that emergency medical services practitioner or emergency medical responder when applied to human beings.
- Should any animal be transported by ambulance, ensure proper cleaning and decontamination of unit after transport
- Documentation
    - Document barriers in the appropriate exam elements
    - Document transfer of assist devices
    - Document the patient's functional needs and avenue exercised to support the patients

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|---|---|
| Data | Size, manufacturer, type of device |
| Goals of Therapy | Limit complications, provide comfort, avoid iatrogenic injuries. To meet and maintain the additional support required for patients with special needs during the delivery of prehospital care |
| Monitoring | As indicated |

## Applies to All Responders

- Follow *Routine Medical Care Guideline*

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# *Medical Guidelines*

# 2.30 SUBMERSION

**Notes:**

- RESCUER SAFETY is paramount. Many well-intentioned rescuers have been injured or killed attempting to save a drowning victim
- Any patient successfully resuscitated after a loss of consciousness underwater event needs transport to the hospital and physician evaluation
- DAN, US Navy, as well as hyperbaric treatment centers have additional reference materials on neurological exams for divers. Have a low threshold for transport, as any divers experiencing neurologic or musculoskeletal complaint warrants a medical evaluation at a hospital
- Acute Respiratory Distress Syndrome (ARDS) is common in a drowning victim. The onset may be delayed. Monitor ventilation status ($SpO_2$, $EtCO_2$ and lung sounds) often. Have a low threshold for utilizing *PEEP* when suspected

**Rescue vs Recovery Considerations:**

- Uncertainty exists regarding survival in cold water drowning; the incident commander should consult with Medical Direction to make a risk vs benefit analysis when determining rescue vs. recovery. Generally, submersion durations < 5min are associated with favorable outcomes, while those > 30min are associated with poor outcomes. The following serve as guidelines only and any termination of resuscitation should occur with consultation with Medical Direction:
    - If water temperature is less than 43°F (6°C) and the patient is submerged with evidence of cardiac arrest:
        - Survival is possible for submersion time less than 90 minutes and resuscitative efforts may be indicated particularly if there is evidence that the patient was cooled prior to submersion
        - Survival is not likely for submersion time greater than 90 minutes and EMS should consider not initiating resuscitation or termination of resuscitation on scene
    - If water temperature is greater than 43°F (6°C) and the patient is submerged with evidence of cardiac arrest:
        - Survival is possible for submersion time less than 30 minutes and resuscitative efforts may be indicated
        - Survival is not likely for submersion time greater than 30 minutes and EMS should consider not initiating resuscitation or termination of resuscitation on scene

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| Data | Blood sugar, EKG, $SpO_2$, water and body temperature |
| Goals of Therapy | • To establish and maintain adequate airway, breathing, and circulation.<br>• To recognize and treat associated trauma and hypothermia. |
| Monitoring | BP, HR, RR, EKG, $SpO_2$, Etc02 |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline* and *Routine Trauma Guideline*
- Routine C-spine stabilization of all submersion patients is not indicated
- When there is concern for a spinal injury, *spinal motion restriction* is indicated
    - Open the airway utilizing a jaw-thrust maneuver
    - Ventilate the patient while maintaining C-spine stabilization
- Always assume that hypothermia is present and follow the *Hypothermia & Frostbite Guideline*
- If the patient is pulseless and not breathing, follow the *Cardiac Arrest Guideline* with the following special considerations:
    - Remove the patient from standing water
    - Dry the chest prior to placing defibrillation pads
- If an upper airway obstruction is suspected follow *Respiratory Distress Guideline*

    - When delivering ventilations and chest compressions, the patient will vomit. Be prepared to suction. Secure the patient's airway as soon as possible
    - Routine use of abdominal thrusts and back blows is not indicated in submersions
- Utilize PEEP if needed to maintain oxygen saturations, monitor blood pressure per *PEEP procedure*.
- Check blood glucose if hypoglycemia is suspected
    - Follow *Diabetic Emergencies Guideline* if the blood glucose is <70 mg/dL

## EMT

- Obtain/transmit 12 lead EKG if indicated
- Monitor $EtCO_2$ if available

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guideline*
- Warm the IV fluids as indicated according to the *Hypothermia & Frostbite Guideline*

## PARAMEDIC

- Consider endotracheal intubation per *Respiratory Distress Guideline*

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# *Medical Guidelines*

# 2.31 SUSPECTED STROKE

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|---|---|
| Data | Blood Glucose, **G-F-A-S-T** Score(s), (**G**aze, **F**acial droop, **A**rm drift, **S**peech difficulties, **T**ime symptoms started), Last known well, blood thinner (anticoagulant, direct thrombin inhibitor) use |
| Goals of Therapy | • To recognize the patient with stroke symptoms<br>• To maintain adequate oxygenation/ventilation and tissue perfusion<br>• To provide emergent treatment, prevent secondary injury, and provide expeditious transport to the closest appropriate medical facility for time critical interventions |
| Monitoring | 12 lead EKG, Heart rate and blood pressure, GFAST Score, Cardiac Monitoring if available |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ > 94%
- Check Blood Glucose level, if blood glucose <70 mg/dL follow *Diabetic Emergencies Guideline*
- **Complete GFAST Scoring**
  - **G**aze 2 points
  - **F**acial Droop 1 point
  - **A**rm Drift 1 point
  - **S**peech Difficulties 1 point
  - **T**ime last known well Not scored - Note activate *stroke alert* if last know well is <24 hours
- Any score greater than 0 is considered a positive GFAST stroke scale

## EMT

Transport Considerations

- A GFAST score of 3 or more, with last known well of <24 hours, is a positive screen for a Large Vessel Occlusion (LVO) and those patients should preferentially be transported to a thrombectomy capable center
- Rural patients scoring 3 or more on the GFAST Stroke Scale may be transported up to 60 minutes directly to a thrombectomy capable center if **all** the following criteria are met:
  - Hemodynamically stable with a protected airway
  - Where additional transport time past the nearest primary stroke center or acute stroke ready hospital does not exceed 30 minutes
  - Additional transport time will not disqualify the patient from IV thrombolytics (generally thrombolytic are administered no more than 4.5 hours from time of onset of symptoms)
  - Time of onset of symptoms is <24 hours
- Patients with a positive score of 2 or less on the GFAST stroke scale should be transported to the closest appropriate stroke hospital/center
- If doubt on destination decision exists, contact medical direction
- Notify receiving facility ASAP of *stroke alert* and results of GFAST Stroke Scale
- Position head of bed at 30 degrees if a spinal injury is not suspected and SBP >100 mmHg
- Maintain head in neutral alignment
- Perform and document GFAST stroke scale every 15 minutes or if any neurologic changes during transport
- Protect paralyzed limbs during transport
- Perform 12 Lead and transmit to receiving hospital as able
- For Seizures refer to *Seizure Guidelines*

**AEMT**

- IV 0.9% NS Lock or KVO - Adults 18g IV in AC location is preferred for stroke patients
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - PEDs Bolus 20 mL/kg, *follow Hypovolemia & Shock guidelines*

**PARAMEDIC**

- Perform cardiac rhythm monitoring, 12-Lead EKGs, and treat any dysrhythmias per appropriate guidelines
- Monitor blood pressure and treat per *Hypertensive Emergency: Adult Guideline*

# 2.32 SYNCOPE/NEAR SYNCOPE/PRE-SYNCOPE

**Note:**

- Syncope involves the abrupt loss of consciousness and the loss of postural tone and resolves spontaneously without medical interventions. Syncope typically is abrupt in onset and resolves equally quickly. EMS clinicians may find the patient awake and alert on initial evaluation
- Near syncope is defined as the prodromal symptoms of syncope. The symptoms that can precede syncope last for seconds to minutes with signs and symptoms that may include pallor, palpitations, nausea sweating, lightheadedness, visual changes, or weakness
- Causes of syncope may include, but are not limited to dehydration, vasovagal reflexes, arrhythmias, stroke, pulmonary embolism, internal bleeding (GI bleeding, ectopic pregnancy, etc.), anaphylaxis
- Recommend transport for all syncope/near syncope patients given the potential for underlying serious causes that may not be readily assessed on scene

| | |
|---|---|
| Data | Blood glucose. EKG |
| Goals of Therapy | • Attempt to identify causative etiology<br>• Treat life threatening causes of syncope |
| Monitoring | Cardiac Rhythm monitoring, Heart rate and blood pressure |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Gently lower the patient to a supine position or Trendelenburg position if hypotensive/altered
- Administer oxygen to maintain $SpO_2 \geq 94\%$
- Check blood sugar if less than 70 mg/dL treat per *Diabetic Emergencies Guideline*

## EMT

- Obtain/transmit 12 lead EKG if capable

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated.
    - PEDs Bolus 20 mL/kg *follow Hypovolemia & Shock guidelines*

## PARAMEDIC

- Cardiac Monitoring

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# *Medical Guidelines*

# 2.33 TACHYCARDIA: ADULT

**Note:**

- Adult narrow complex rhythms have a QRS duration <0.12 seconds, wide complex rhythms have a QRS duration >0.12 seconds
- Symptomatic implies that an arrhythmia is causing subjective sensations such as lightheadedness, altered mental status, ischemic chest pain or dyspnea
- Criteria for characterizing an adult patient as "unstable" is the patient is symptomatic and:
    - Hemodynamic criteria:
        - SBP <90 mmHg AND Heart Rate >150 beats/min
    - Clinical Criteria
        - Signs of shock (poor perfusion) are present, including:
            - ALOC
            - Absent radial pulses
            - Pallor and diaphoresis
    - Signs of pulmonary edema are present, including:
        - Labored breathing
        - Rales (wet lungs)
        - Hypoxia ($SpO_2$ <94%)

| | |
|---|---|
| Data | Symptoms, $SpO_2$, 12-Lead EKG, $EtCO_2$, Blood Sugar if Diabetic or ALOC, Treatments |
| Goals of Therapy | To restore hemodynamic stability in a patient who exhibits a tachydysrhythmia that compromises effective perfusion or is symptomatic |
| Monitoring | Response to therapy, Continuous cardiac monitoring and $SpO_2$ |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ >94%
- For angina or chest pain, see *Chest Pain of Suspected Cardiac Origin Guideline*

## EMT

- Acquire 12-Lead EKG
    - If machine interpretation indicates "***ACUTE MI SUSPECTED***", refer to the *Chest Pain of Suspected Cardiac Origin Guidelines* call for ALS and make arrangements to transport to nearest STEMI receiving facility if operationally feasible, notify receiving facility
- Consider ALS intercept
- Consider Antipyretic to treat fever per pain management guidelines

## AEMT

- IV/IO 0.9% NS Lock or KVO, large bore IV catheter in an antecubital site is preferred
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated. *Follow Hypovolemia & Shock guideline*

## PARAMEDIC

- Perform continuous cardiac rhythm monitoring and 12-Lead, consider recording continuous EKG during treatments

**NARROW RHYTHMS (QRS duration <0.12 sec)**

- **Narrow Regular Rhythms**
    - **Sinus Tachycardia** (The upper rate of sinus tachycardia is calculated at approximately 220 beats/min minus the patient's age in years)

- Note beat to beat variability with activity, breathing or stress level
- Identify and treat underlying cause e.g. pain, dehydration, shock, hypoglycemia, hemorrhage, hypoxemia, anxiety, fever, sepsis, drug induced, recent exertion, hyperthyroidism, and anemia
- Do not treat sinus tachycardia with cardiac medications or cardioversion, address the above causes

- **Supraventricular Tachycardia** (Generally Heart Rate >180 beats/min in adults)
  - *Unstable and rate > 150 BPM* → Perform Synchronized cardioversion as below
  - *Stable*
    - Vagal maneuvers are considered first line therapy in stable patients
      - Have the patient bear down
      - If no success, have seated patient blow through a 10 mL syringe trying to move plunger until out of breath, then lie them flat and elevate their legs into Trendelenburg position
    - **Adenosine** 6 mg IV over 1-2 seconds. If unsuccessful, repeat with 12 mg IV over 1-2 seconds. Follow all doses with a 20-30 mL saline flush by rapid IV push
      - Large bore IV catheter in an antecubital site is preferred for the administration of Adenosine
      - Warn patient about brief but unpleasant side effects of adenosine: including flushing, lightheadedness, slowing of heart rate, anxiety and chest pain
      - Record a rhythm strip during Adenosine administration
      - If Atrial Fibrillation/Flutter is noted, do not administer additional doses

- **Narrow Irregular Rhythms**
  - **Rapid Atrial Fibrillation or Flutter**
    - Do not treat Rapid Atrial Fibrillation or Flutter that is a normal physiologic response (e.g. Fever, Hypoxia, Shock, Sepsis, Hemorrhage)
    - *Unstable and rate > 150 BPM* → Perform Synchronized cardioversion as below
    - *Stable and* Rapid Atrial Fibrillation/Flutter if causing significant palpitations or dizziness
      - For HR >130 BPM and SBP >110 mmHg, if available, consider **Diltiazem (Cardizem)** 0.25 mg/kg (max dose is 20 mg) IV **SLOW** over 5 min
        - If inadequate response after 15 minutes, may re-bolus at 0.25 mg/kg (max dose 20mg) IV **SLOW** over 5 minutes. Hold if hypotensive
        - For patients older than 50 years of age, systolic blood pressure 110 -120 mmHg, known renal failure, or CHF, initial bolus 5–10 mg administered IV over 2 minutes
        - For patients older than 65 years old, recommend maximum initial dose of diltiazem 10 mg IV and a maximum second dose of 20 mg
        - Avoid Diltiazem in WPW or wide complex irregular rhythms
        - Refer to calcium channel blocker overdose in *Toxic Exposure/Biologics/Overdose Guideline* if the patient becomes hemodynamically or clinically unstable.
        - If Cardizem unavailable, and patient remains stable, monitor and transport

**WIDE RHYTHMS (QRS duration > 0.12 sec)**

- **Wide Regular Rhythms** (with HR >130 BPM)
  - Do not routinely treat PVCs or short (less than 6 beats) runs of asymptomatic Ventricular Tachycardia
  - For wide complex arrhythmia due to Tricyclic Antidepressant other Sodium Channel Blocking Drug Overdose, administer 1 mEq/kg **Sodium Bicarbonate**, not to exceed 50 mEq per dose, avoid amiodarone administration follow *Toxic Exposure/Biologics/Overdose Guideline*

  - **Monomorphic Ventricular Tachycardia**
    - *Unstable* → Perform Synchronized cardioversion as below
      - If the patient develops pulseless VT, defibrillate (i.e. unsynchronized cardioversion) at max Joules and follow *Cardiac Arrest guideline*
    - *Stable*
      - **Amiodarone** 150 mg slow IV over 10 minutes, may repeat x1
      - If amiodarone unsuccessful, consider **Magnesium** 2 g IV slowly (over 10 minutes)

- **Wide Irregular Rhythms** (with HR >130 BPM)
    - **Polymorphic Wide QRS (Torsades de Pointes)**
        - **Irregular rhythms are polymorphic VT (including *Torsades de Pointes*) until proven otherwise**
        - *Unstable* → Perform Synchronized cardioversion as below
            - If the patient develops pulseless VT, defibrillate (i.e. unsynchronized cardioversion) at max Joules and follow *Cardiac Arrest guideline*
            - **Magnesium** 2 g IV/IO in Cardiac Arrest
        - *Stable Torsades De Pointes or Tachycardic Rhythms with QTc >550ms* (especially patients with history of End Stage Renal Disease, alcoholism, Long QT Syndromes, or other risk factors)
            - Consider **Magnesium** up to 2 g IV (slowly over 20 minutes)
            - Amiodarone is contraindicated in Torsades de Pointes
            - Avoid QT prolonging medication (Zofran, Amiodarone, Diphenhydramine)
- **Wolf Parkinson White Syndrome**
    - *Unstable and Rate >150 BMP* → Perform Synchronized cardioversion as below
    - *Stable* → *Monitor and Transport*
- **Synchronized Cardioversion**
    - Consider pre-procedural sedation or analgesia (midazolam OR opioid). However, overall patient status, including BP, may affect ability to administer sedative/analgesia
        - **Fentanyl Citrate** up to 50-100 mcg IV/IO/IN/IM
        - **Versed** 2 mg IV/IO/IN/IM
        - Reduce dose by 50% for smaller framed and elderly
    - Perform first synchronized cardioversion at 150 Joules
    - If unsuccessful, increase by 50 joules for each subsequent attempt

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# *Medical Guidelines*

# 2.34 TACHYCARDIA: PEDIATRIC

**Note:**

- **Pediatric narrow complex rhythms have a QRS duration <0.09 sec., Wide complex rhythms have a QRS duration >0.09 sec.**
- Symptomatic implies that an arrhythmia is causing subjective sensations such as lightheadedness, altered mental status, ischemic chest pain or dyspnea
- Utilize Broselow tape or approved medical director product or application for pediatric medication dosing
- Criteria for characterizing a pediatric patient as "unstable" include the patient is symptomatic and:
    - Clinical signs of respiratory distress or failure/hypoxemia:
        - Apnea
        - Retractions, flaring or grunting
    - Signs of decreased perfusion:
        - AMS/Abnormal appearance
        - Inequality of central and distal pulses
        - Slowed or absent capillary refill <3 sec
        - Hypotension (See *Hypovolemia & Shock Guideline*)

| | |
|---|---|
| Data | Symptoms, $SpO_2$, 12-Lead EKG, $EtCO_2$, Blood Sugar if Diabetic or ALOC, Treatments |
| Goals of Therapy | To restore hemodynamic stability in a patient who exhibits a tachydysrhythmia that compromises effective perfusion or is symptomatic |
| Monitoring | Response to therapy, Cardiac monitoring and $SpO_2$ |

## EMERGENCY MEDICAL RESPONDER

- Follow *Routine Medical Care Guideline*
- Administer oxygen to keep $SpO_2$ >94%

## EMT

- Acquire 12-Lead EKG
- Consider ALS intercept
- Consider Antipyretic to treat fever per *Fever and Sepsis Guideline*

## AEMT

- IV 0.9% NS Lock or KVO, large bore IV catheter in an antecubital site is preferred
- PEDs Bolus 20 mL/kg, *Follow Hypovolemia & Shock Guideline*

## PARAMEDIC

- Perform and continuous cardiac rhythm monitoring and 12-Lead, consider recording continuous EKG during treatments

**NARROW RHYTHMS (QRS duration < 0.09 sec)**

- **Narrow Regular Tachycardias**
    - **Sinus Tachycardia** (The upper rate of sinus tachycardia is calculated at approximately 220 beats/min minus the patient's age in years (See *Pediatric normal vital signs*)
        - Note beat to beat variability with activity, breathing or stress level
        - Identify and treat underlying cause ex. pain, dehydration, shock, hypoglycemia, hypoxemia, anxiety, fever, sepsis, drug induced, recent exertion, hyperthyroidism, and anemia
        - Do not treat sinus tachycardia with cardiac medications or cardioversion, address the above causes

- **Supraventricular Tachycardia** Infants treat rate >220 beats/min Children treat rate >180 beats/min
  - *Unstable* → Perform Synchronized cardioversion as below
  - *Stable*
    - Vagal maneuvers are considered first line therapy in stable patients
    - Children old enough to cooperate can follow adult procedures
    - Consider applying ice to the face as Vagal Maneuver for infants
      - Inform parents of procedure prior to performing
      - Do not obstruct airway
    - **Adenosine** 0.1 mg/kg first dose (max 6 mg), Adenosine 0.2 mg/kg second dose (max 12 mg)
      - Follow all doses with a saline flush by rapid IV push
      - Large bore IV catheter in an antecubital site is preferred for the administration of Adenosine
      - Warn patient about brief but unpleasant side effects of adenosine: including flushing, lightheadedness, slowing of heart rate, anxiety, and chest pain
      - Record a rhythm strip during Adenosine administration
      - If Atrial Fibrillation/Flutter or Sinus Tachycardia is noted, do not administer additional doses

- **Narrow Irregular Rhythm**
  - **Rapid Atrial Fibrillation or Flutter**
    - *Unstable* → Perform Synchronized cardioversion as below
    - *Stable* → Monitor and Transport

**WIDE RHYTHMS (QRS duration < 0.09 sec)**

- **Wide Regular Rhythm** (with HR >220 BPM Infants, and >180 BPM Pediatric)
  - Do not routinely treat PVCs or short (less than 6 beats) runs of asymptomatic Ventricular Tachycardia
  - Wide complex arrhythmia due to Tricyclic Antidepressant other Sodium Channel Blocking Drug Overdose, administer 1 mEq/kg **Sodium Bicarbonate**, not to exceed 50 mEq per dose, avoid amiodarone administration
  - **Monomorphic Ventricular Tachycardia**
    - *Unstable* → Perform Synchronized cardioversion as below
      - If the patient is patient develops pulseless VT defibrillate (i.e., unsynchronized cardioversion) at max Joules and follow *Cardiac Arrest Guideline*
      - Following Cardioversion administer **Amiodarone** 5 mg/kg max 150 mg slow IV over 20 minutes
    - *Stable (Consider involvement of Medical Direction)*
      - For stable pediatric patients with regular monomorphic wide complex tachycardia believed to be SVT with aberrancy, consider **Adenosine** per SVT Dosing
      - **Amiodarone** 5 mg/kg max 150 mg slow IV over 20 minutes
- **Wide Irregular Rhythm** (with HR >130 BPM)
  - **Polymorphic Wide QRS (Torsades de Pointes)**
    - **Irregular rhythms are polymorphic VT (including *Torsades de Pointes*) until proven otherwise**
    - *Unstable* → Perform Synchronized cardioversion as below
      - If the patient develops pulseless VT defibrillate (i.e. unsynchronized cardioversion) at max Joules and follow Cardiac Arrest guidelines
      - Magnesium 50 mg/kg (max 2 g) IV/IO in Cardiac Arrest
    - *Stable Torsades De Pointes or Tachycardic Rhythms*
      - **Magnesium** 50 mg/kg (max 2 g) IV, administer over 10 minutes
        - Avoid QT prolonging medication (Zofran, Amiodarone, Diphenhydramine)

- **Wolf Parkinson White Syndrome**
  - *Unstable* → Perform Synchronized cardioversion as below
  - *Stable* → *Monitor and Transport*
- **Synchronized Cardioversion**
  - Consider pre-procedural sedation or analgesia (midazolam OR opioid). However, overall patient status, including BP, may affect ability to administer sedative/analgesia
    - **Fentanyl** up to 1 mcg/kg IV/IO or 2 mcg/kg IN max dose 100 mcg per bolus **or Midazolam** 0.1 mg/kg slow IVP (0.2 mg/kg IN/IM) (max single dose 2 mg)
  - Synchronized Cardioversion 1 j/kg first attempt
  - Synchronized Cardioversion 2 j/kg subsequent attempts

# 2.35 TOXIC EXPOSURE/BIOLOGICS/OVERDOSE

**Note:**

- **Scene Size-Up and Crew Safety:** Performing a scene size-up and maintaining crew safety are the top initial priorities. In a hazardous materials incident, crew members should stage in a safe location, don the appropriate level of PPE, request additional special resources, identify the hazardous substance, and decontaminate before initiating full patient care
- **Hazardous Materials or Terrorism Events:** Consider a hazardous materials or intentional/terrorism event whenever multiple people and/or animals display signs or symptoms of illness
- **Symptoms of Toxic Exposure:** Symptoms following toxic ingestion or other forms of exposure may include altered mental status, respiratory distress, lethal arrhythmias, severe vomiting, uncontrolled bleeding, seizures, shock, and death
- **Patient Deterioration:** Patients may deteriorate quickly or progressively over time based on the toxicity, dose, half-life, patient's weight or tolerance, or co-ingestion of other substances
- **Resources for Toxic Substance Management:** Available resources for identification, isolation, safe handling, patient care, and contamination management include:
    - Product container label or placard for name, UN number, colors and symbols, or ingredients listed according to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) or other standards
    - Emergency Response Guidebook
    - Safety Data Sheets (SDS)
    - Representative of the site or transport agency
    - Poison Control Center, 1-800-222-1222
    - Medical Direction
- **Decontamination:** If eye or skin contamination is present, decontaminate by irrigating with copious amounts of normal saline or tap water. Brush off dry chemicals prior to decontamination
- **Specific Considerations**
    - **Organophosphate Compounds:** These chemicals are used in industrial, domestic, and terrorism applications and can produce symptoms ranging from mild to rapidly fatal. Common sources include:
        - Insecticides: Malathion, parathion, diazinon, fenthion, dichlorvos, chlorpyrifos, ethion
        - Nerve gases: Soman, sarin, tabun, VX
        - Ophthalmic agents: Echothiophate, isoflurophate
        - Antihelminthics: Trichlorfon
        - Herbicides: Tribufos (DEF), merphos
        - Industrial chemicals: Tricresyl phosphate
    - **Anhydrous Ammonia:** This extremely toxic liquid or gas is used in manufacturing, refrigeration, and agriculture (as a fertilizer). It can cause severe and rapidly fatal irritation and corrosive damage to the skin, respiratory, or gastrointestinal tract. Additional PPE is required for uncontrolled venting/spills, close contact, or when not in a sufficiently well-ventilated area
    - **Cyanide Ingestion:** Following cyanide ingestion, emesis may off-gas toxic hydrogen cyanide, placing rescuers at risk

- **Biologic Agents:**
  - Category A: Anthrax, Botulism, Plague
  - Category B: Ricin, Cholera, T2 Mycotoxin
  - Category C: Viruses that cause Encephalitis, Hantavirus, Influenza
  - Notify medical direction and receiving facility if there is an actual or potential encounter
- **Stimulant Use or Abuse:** If the patient is found naked, this may elevate the suspicion for stimulant use or abuse, which increases the risk for sudden death secondary to hyperactive delirium with agitated behavior
- **Single Pill Ingestions:** Single pill ingestions can be fatal for toddlers. It is crucial that EMS carefully assess medications the toddler could have accessed and bring suspect medications to the ED
- **Carbon Monoxide Exposure:** Carbon monoxide is an odorless and tasteless gas that can cause headache, dizziness, fatigue, flu-like symptoms, confusion, decreased LOC, and in severe cases, death. Regardless of on-scene carbon monoxide levels or personal carbon monoxide levels, all symptomatic patients should be transported for formal evaluation
- **Fentanyl Exposure:** Fentanyl powder is not readily absorbed through the skin, making incidental skin contact unlikely to cause intoxication or overdose. If exposure occurs, brush off the powder and wash promptly with cool water and soap if available

| | |
|---|---|
| Data | Blood glucose, Identify toxic substances ingested/exposed too |
| Goals of Therapy | Identification of Agent. Decontamination to reduce exposure, stabilization and supportive care, provision of antidotes, anticipation and correction of toxic effects on the CNS, cardiovascular and respiratory systems |
| Monitoring | Cardiac monitoring, $EtCO_2$, temperature |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline*
- Administer Oxygen to keep $SpO_2$ ≥94%
- If the patient is unconscious, place him/her in the recovery position. Follow the *ALOC Guidelines*
  - Check blood glucose. If <70 mg/dL, follow the *Diabetic Emergencies Guideline*
- Any patient in a confined space with combustion products or for Carbon monoxide, Cyanide poisoning or inhaled poison, remove patient from exposure and treat with high-flow oxygen therapy regardless of $SpO_2$ reading
- Address all other issues with appropriate guidelines
- If opiate overdose suspected, consider **Narcan** 0.5-2 mg IN or IM (EMT only) per dose to support oxygenation/ventilation. PEDs dose 0.1 mg/kg, max 0.5 mg dose.
  - Examine patient and remove any opioid patches with gloves
  - Repeat dose as necessary based on patient's respiratory effort. Remove opioid patches with gloves

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
  - PEDs Bolus 20 mL/kg *follow Hypovolemia & shock guideline*
- **Narcan** IV may be administered at dosages and goals as above

## PARAMEDIC

- In cases of suspected cyanide exposure, presence of shock not attributed to other causes or respiratory/cardiac arrest or depression may be treated with a cyanide treatment kit per manufacturer's recommendation
  - Consider **Cyanokit (hydroxocobalamin)** 5 g (Pediatric dose 70 mg/kg) over 15 minutes
- See treatment of exposure/overdose of specific drug classes below

| *Class of drugs* | *Treatment Indications* | *Specific Paramedic Treatment(s)* |
|---|---|---|
| Amphetamines | Agitation, psychosis, Hypertensive Emergency or ventricular arrhythmias | **Versed:** dosing per *Agitated & Combative Patients Guideline* and *Seizure Guideline* |
| Benzodiazepines (BZD) | Treat signs and symptoms. Be aware for respiratory depression and treat. | Treat arrhythmias according to the appropriate guideline.<br>Treat seizures associated with benzodiazepine withdrawal according to the *Seizure Guideline* |
| Beta Blockers | Profound bradycardia, hypotension or conduction defects.<br>Check blood glucose level on all patients but especially on pediatric patients as beta-blockers can cause hypoglycemia | Consider **Glucagon** 2 mg slow IVP for adults and 0.1mg/kg (max 2mg) pediatrics with refractory hypotension or bradycardia per *Bradycardia Guideline*.<br>*Treat hypoglycemia* per guidelines |
| Calcium Channel Blockers | Profound bradycardia, hypotension or conduction defects | Consider **Calcium Chloride 10%** 1000 mg (10 mL) IV/IO **SLOW** over 10 minutes for adults and 20mg/kg **SLOW** IVP for pediatrics in extremis.<br>In refractory cases, consider **Glucagon** 2 mg slow IVP for adults and 0.1 mg/kg pediatrics. |
| Cocaine | Agitation, seizures, Hypertensive Emergency or ventricular arrhythmias, | Cooling per *Heat Emergencies Guideline*<br>**Versed:** Dosing per *Agitated & Combative Patients Guideline*<br>**Sodium Bicarbonate:** 1 mEq/kg up to 50 mEq may be given if a wide QRS or cardiac arrest is noted. May repeat in discussion with medical direction<br>**Nitroglycerin:** per *Chest Pain Guideline* or *Hypertensive Emergencies Guideline* |
| Opioids | Narcan may be administered in cases of over sedation due to opioid administration, or in suspected opioid overdoses in patients without a history of long-term use, chronic abuse or addiction. Avoid inducing acute narcotic withdrawal by providing low dose and repeating as needed for respiratory support | In the setting of an overdose, if the patient has ALOC – with or without a gag reflex, or shows signs of respiratory depression, ventilatory support takes precedence over reversing the overdose with Narcan.<br><br>**Naloxone (Narcan)** 0.5mg up to 2mg IV/IO/IN/IM per dose (Pediatric 0.1mg/kg) until the patient reaches normal respiratory pattern. |

| | | |
|---|---|---|
| Organophosphate Poisoning (Pesticides and Nerve Agents) | Profound bradycardia, seizures, abnormal (wet) lung sounds<br>The organophosphate toxidrome:<br>**S** – Salivation, Seizures<br>**L** – Lacrimation<br>**U** – Urination<br>**G** – GI vomiting and diarrhea<br>**B** – Bradycardia*, bronchorrhea, bronchospasm<br>**A** – Arrhythmias<br>**M** – Miosis (small pupils) *<br>* Tachycardia and mydriasis (dilated pupils) are also possible<br>Note: Organophosphates are highly toxic in very small quantities and pose a significant risk to EMS. | Autoinjector/Atropine IM dosing below every 5 min until lung sounds clear to auscultation and improvement in HR/BP. Use atropine in the initial treatment of bradycardia and seizures.<br><br>Signs of atropinization are the end point of EMS treatment: flushing, pupil dilation, dry mouth, and tachycardia.<br><br>If seizures develop **Versed** 0.1mg/kg IV/IO/ (max 5mg bolus) or 0.2mg/kg IM (max 10mg bolus) per seizure guidelines<br><br>As an adjunct to the above therapies: Administer Nebulizer Therapy: **Albuterol Sulfate** 2.5 mg in 3 mL with **Ipratropium Bromide (Atrovent)** 0.5 mg in 2 mL administer per handheld nebulizer, mask or in-line nebulizer; may repeat albuterol x 2 additional doses<br><br>For additional dosing information see [1] below |
| Tricyclic Antidepressants (TCA) | Decreased level of consciousness; hypotension, seizures, malignant arrhythmias (e.g., *Torsades de Pointes*, VT), prolongation of the QT or QRS intervals.<br>Caveat: Patients with TCA overdoses are prone to deteriorating very quickly.<br>Note: Sodium containing solutions act like antidotes, because they protect the heart against the toxic effects of the TCA. Induced alkalosis from bicarbonate and hyperventilation also help protects against the toxic effects of TCAs. | Run 1 or 2 IVs of Normal Saline wide open. Treat arrhythmias according to the appropriate guideline. Treat seizures according to the *Seizure Guidelines*<br>**Sodium Bicarbonate 8.4%** 1 mEq/kg up to 50 mEq may be given if a wide QRS is noted. May repeat once in discussion with online medical direction. For long adult transports, consider a Sodium Bicarbonate drip with up to 3 amps in a liter of NS @ 250 mL/hr after the initial boluses are in in discussion with online medical direction. Avoid Amiodarone.<br>If advanced airway in place, hyperventilate to $EtCO_2$ of 25-30 mmHg. |

| | | |
|---|---|---|
| Hydrofluoric (HF) Acid Exposure | An oral or large dermal exposure can result in significant systemic hypocalcemia with possible QT prolongation and cardiovascular collapse. Consult with Medical direction for calcium administration/application. Ensure appropriate PPE | 1) Vigorously irrigate all affected areas with water or normal saline for a minimum of 15 minutes<br>2) Apply a cardiac monitor for oral or large dermal exposures, assess for prolonged QT<br>3) Consider application calcium preparation to exposed external skin if pain or redness present by combining 10 mL of calcium chloride with 75-150 mL of water-soluble lubricant if available, contact medical direction for assistance. |

| | | |
|---|---|---|
| | | 4) Consider **Calcium Chloride 10%** 1000 mg (10 mL) IV/IO **SLOW** for adults and 20 mg/kg **SLOW** IVP for PEDS in cardiac arrest |

[1] **Mild Acetylcholinesterase Inhibitor Agent Exposure-** Miosis and severe rhinorrhea – Atropine Alone, do not administer 2-Pam

| Patient | Atropine Dose (Weight) IM or via Auto-injector |
|---|---|
| **Infant:** 0–2 years of age | 0.05 mg/kg IM or via auto-injector (i.e., *0.25 and/or 0.5 mg auto-injector(s))* |
| **Child:** 3–7 years of age (13–25 kg) | 1 mg IM or via auto-injector (i.e., *one 1 mg or two 0.5 mg auto-injectors)* |
| **Child:** 8–14 years of age (26–50 kg) | 2 mg IM or via auto-injector (i.e., *one 2 mg or two 1 mg auto-injectors)* |
| **Adolescent/Adult** | 2 mg IM or via auto-injector |
| **Pregnant Patients** | 2 mg IM or via auto-injector |
| **Geriatric/Frail** | 1 mg IM or via auto-injector |

**Mild to Moderate Acetylcholinesterase Inhibitor Agent Exposure -**These include localized swelling, muscle fasciculations, nausea and vomiting, weakness, shortness of breath. Utilize auto-injectors if available. May use a 600 mg 2PAM Cl auto-injector in an infant as small as 12 kg.

| Patient (Weight) | Atropine Dose IM or via Auto-injector | Pralidoxime Chloride Dose IM or via 600 mg Auto-injector |
|---|---|---|
| **Infant:** 0–2 years of age | 0.05 mg/kg IM or via auto-injector (i.e., *0.25 mg and/or 0.5 mg auto-injector)* | 15 mg/kg IM |
| **Child:** 3–7 years of age (13–25 kg) | 1 mg IM or via auto-injector (i.e., *one 1 mg auto-injector or two 0.5 mg auto-injectors)* | 15 mg/kg IM **OR** One auto-injector (600 mg) |
| **Child:** 8–14 years of age (26–50 kg) | 2 mg IM or via auto-injector (i.e., *one 2 mg auto-injector or two 1 mg auto-injectors)* | 15 mg/kg IM **OR** One auto-injector (600 mg) |
| **Adolescent/ Adult** | 2–4 mg IM or via auto-injector | 600 mg IM **OR** One auto-injector (600 mg) |
| **Pregnant Patients** | 2–4 mg IM or via auto-injector | 600 mg IM **OR** One auto-injector (600 mg) |
| **Geriatric/Frail** | 2 mg IM or via auto-injector | 10 mg/kg **IM** **OR** One auto-injector (600 mg) |

- Repeat initial dose (2 mg max) of atropine via autoinjector (preferable) or IM every 5 - 10 minutes until dyspnea, resistance to ventilation, and secretions are minimized.
- If resistance to ventilation is significant, requiring repeat dosing in less than 5 minutes utilize the higher doses and increase frequency depicted in the severe effects section below
- May repeat pralidoxime - up to a total of 45 mg/kg during the first hour.

- May repeat pralidoxime - up to 45 mg/kg 1 hour after initial treatment.

**Severe Acetylcholinesterase Inhibitor Agent Exposure-** These include the above as we all as unconsciousness, convulsions, apnea, flaccid paralysis and requiring assisted ventilation (severe respiratory distress). I.V. atropine has produced ventricular fibrillation in hypoxic animals with nerve agent poisoning. Therefore, it is recommended that hypoxia be corrected prior to atropine administration. However, atropine should not be withheld due to fears of this complication. It would be preferable to utilize an atropine autoinjector for the first dose in the hypoxic nerve agent exposed patient.

| Patient (Weight) | Atropine Dose IM or via 600 mg Auto-injector | Pralidoxime Chloride Dose IM or via Auto-injector |
|---|---|---|
| **Infant:** 0–2 years of age | 0.1 mg/kg IM or via auto-injector (i.e., *0.25 mg and/or 0.5 mg auto-injector)* | 45 mg/kg **IM** |
| **Child:** 3–7 years of age (13–25 kg) | 0.1 mg/kg IM **OR** 2 mg via auto-injector (i.e., one 2 mg auto-injector or four 0.5 mg auto-injectors) | 45 mg/kg **IM OR** One auto-injector (600 mg) |
| **Child:** 8–14 years of age (26–50 kg) | 4 mg IM or via auto-injector (i.e., *two 2 mg auto-injectors or four 1 mg auto-injectors)* | 45 mg/kg **IM OR** Two auto-injectors (1200 mg) |
| **Adolescent:** 14 years of age or older | 6 mg IM or via auto-injector (i.e., *three 2 mg auto-injectors)* | Three auto-injectors (1800 mg) |
| **Adult** | 6 mg IM or via auto-injector (i.e., *three 2 mg auto-injectors)* | Three auto-injectors (1800 mg) |
| **Pregnant Patients** | 6 mg IM or via auto-injector (i.e., *three 2 mg auto-injectors)* | Three auto-injectors (1800 mg) |
| **Geriatric/Frail** | 2–4 mg IM or via auto-injector (i.e., *one to two 2 mg auto-injectors)* | 25 mg/kg IM **OR** two to three auto-injectors (1200-1800 mg) |

# 2.36 VAGINAL BLEEDING AFTER DELIVERY

| | |
|---|---|
| Data | $SpO_2$, attempt to quantify maternal blood loss, bring blood-soaked items with patient to receiving facility |
| Goals of Therapy | • Identify potentially life-threatening hemorrhage.<br>• Treat for shock.<br>• Display sensitivity to the emotional needs of the parents.<br>• Reduce pain.<br>• Expeditious transport to the closest appropriate delivering facility |
| Monitoring | Monitor blood pressure, heart rate and mental status for signs of shock |

## EMERGENCY MEDICAL RESPONDER/EMT

- Administer Oxygen to maintain maternal $SpO_2$ > 94%
- Massage fundus vigorously while applying suprapubic pressure with your other hand to prevent uterus from expelling. This may cause discomfort to the mother
- Avoid NSAIDS
- Transport mother in head down, left lateral recumbent position
- Apply loose bulky dressings to vulva (do not pack vagina)
- Encourage mother to breastfeed baby if mother and newborn do not need immediate resuscitation
- Consider requesting MD-1 response for potential use of ***Pitocin*** to help reduce post-partum hemorrhage.

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated

## PARAMEDIC

- **TXA** 1 g IV/IO over 20 minutes if concerned for hemorrhagic shock; sustained SBP < 90 mmHg or sustained heart rate > 110 beats per minute. Hang blood tubing if available. May repeat x 1
- Consider pain medications for painful contractions. Avoid NSAIDS

# 2.37 VAGINAL BLEEDING BEFORE DELIVERY

**Note:**

- Vaginal bleeding and severe lower abdominal pain in the first trimester of pregnancy should be considered a ruptured ectopic pregnancy until proven otherwise. Be wary of the female of childbearing age who presents with signs of hemorrhagic shock or syncope
- Bleeding at any point in pregnancy can be associated with loss of the fetus. Be sensitive to of potential loss of pregnancy
- After about 20 weeks of pregnancy, when the mother is in a supine position, the gravid uterus can compress the inferior vena cava, which decreases preload and causes hypotension
- Pregnancy usually lowers a patient's blood pressure. If you get systolic readings between 80 – 100 mmHg, ask the mother what her most recent blood pressure was in her obstetric provider's office

| | |
|---|---|
| Data | $SpO_2$, Last Menstrual Period |
| Goals of Therapy | • Identify potentially life-threatening hemorrhage<br>• Treat for shock<br>• Display sensitivity to the emotional needs of the parents<br>• Reduce pain<br>• Expeditious transport to the closest appropriate facility with considerations for OB care |
| Monitoring | Monitor blood pressure, heart rate and mental status for signs of shock |

## EMERGENCY MEDICAL RESPONDER/EMT

- Administer Oxygen to maintain $SpO_2$ > 94%
- Place in supine position with legs elevated
- If > 20 weeks pregnant, place on left lateral side, recumbent, for transport
- Keep the mother warm and offer comfort measures
- Attempt to preserve any products of conception that pass in appropriate biohazard container and transport them to the receiving facility with the patient.
- Place the patient in left lateral Trendelenburg Position, if possible
- NSAIDS contraindicated in pregnancy

## AEMT

- IV 0.9% NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - Avoid permissive hypotension

## PARAMEDIC

- Monitor closely for any changes in abdominal exam or condition

*Mercyhealth System*

# *Medical Guidelines*

# 2.38 VENTRICULAR ASSIST DEVICE (VAD)

**Note:**

- VADs are implanted pumps that provide a means of perfusion for patients whose hearts otherwise could not. Typically, these patients have end-stage heart failure with very low ejection fractions
- VADs provide a continuous steady flow. Because of this, the patient will not have a palpable pulse
- These devices are very preload dependent, and afterload sensitive
- VADs are powered by battery packs, and patients typically carry spare battery packs with them at all times. Transport all VAD equipment with patient.
- Patients and their family members have unique knowledge in the care of the specific LVAD and its potential complications, utilize them as needed
- Call the VAD center as soon as possible for assistance in patient care. Typically, the family will have called the VAD center before calling EMS
- Left Ventricular Assist Devices (LVADs) are the most common. Right sided Ventricular Assist Devices (RVAD) and Bilateral Ventricular Assist Devices (BiVAD) exist, but are much less common
- Do not place defibrillation pads over device

| | |
|---|---|
| Data | LVAD Center, Battery charge, Device connections, Cardiac rhythm, $SpO_2$, $EtCO_2$ |
| Goals of Therapy | Troubleshoot device and restore function, restore and/or maintain adequate tissue perfusion |
| Monitoring | Mental status, capillary refill, cardiac rhythm, $SpO_2$, $EtCO_2$ |

## EMERGENCY MEDICAL RESPONDER/EMT

- Follow *Routine Medical Care Guideline*
- If unresponsive and not breathing, perform chest compressions, with hands placed above the nipple line, otherwise follow *Cardiac Arrest Guideline*
    - Apply AED and follow its direction, deliver shock if instructed for patient
- Administer oxygen to keep $SpO_2$ >94%
- If ventilations are inadequate, assist breathing with gentle synchronous ventilations with bag-valve mask (BVM) and 100% Oxygen; Support ventilation with 100% Oxygen if apnea or hypopnea occurs
- If there is altered level of consciousness but gag reflex present, consider placement of an appropriately sized nasopharyngeal airway
    - If patient is unresponsive with no gag reflex, consider oropharyngeal airway or supraglottic airway device
    - If patient becomes responsive or does not tolerate airway, remove advanced airway with patient in recovery position and suction oropharynx if needed
- Troubleshoot the device
    - Auscultate for humming in the chest, indicating the pump is working
    - Check the device for battery power, change if battery is low or dead
    - Check the drive site for signs of infection: warmth, redness, discharge
- LVAD patients are typically anticoagulated. Assess for bleeding and treat per *Routine Trauma Guideline* and *Hypovolemia & Shock Guideline*
- Initiate transport to the closest appropriate facility, typically the closest Emergency Department of any level, in conjunction with the VAD Center. Some VAD Centers will have preference for where the patient is transported

## AEMT

- IV 0.9% LR/NS Lock or KVO
- Initiate a 250 mL bolus if there are signs of hypotension, hypovolemia, or shock, reassess and repeat as indicated
    - Assessing blood pressure may be impossible with standard methods. Assess other signs of perfusion, including capillary refill, mental status, and $EtCO_2$

## PARAMEDIC

- For unresponsive patients who are not breathing, continue care per *Cardiac Arrest Guideline*
- For patients with respiratory failure, but with signs of adequate perfusion, follow Respiratory Distress Guidelines
- For patients with active bleeding, treat per *Routine Trauma Guideline* and *Hypovolemia & Shock Guideline*
- LVAD patients are at increased risk of infection. If signs of infection are present, refer to *Sepsis Guideline*

# SECTION 3 MEDICATIONS

# 3.01 Approved Medication List

| EMR | EMT | AEMT | Paramedic | Medication |
|---|---|---|---|---|
| | √ | √ | √ | Acetaminophen 325 mg tablet, 500 mg tablet, 160 mg / 5 mL liquid, 1000 mg / 100 mL (Optional for non-transport units) |
| | | | √ | Adenosine (Adenocard) 12 mg / 4 mL pre-loaded syringe, 6 mg, 12 mg vials |
| √ | √ | √ | √ | Albuterol Sulfate 0.83% 2.5 mg / 3 mL unit dose or Metered Dose Inhaler (MDI) |
| | | | √ | Amiodarone Hydrochloride (Cordarone) 150 mg / 3 mL |
| √ | √ | √ | √ | Aspirin bottle, chewable baby, 81 mg tablets |
| | | | √ | Atropine Sulfate 1 mg / 10 mL preloaded syringe |
| | | | √ | Calcium Chloride 10% solution, 1 g / 10 mL pre-loaded syringe or vial |
| | | | √ | Cefazolin (Ancef) 1 g / vial for reconstitution |
| | | √ | √ | Dextrose 10% 250 mL Bags |
| | | | √ | Diltiazem (Cardizem) 25 mg / 5 mL vial (refrigerated) [Optional] |
| | | | √ | Diphenhydramine Hydrochloride 50 mg / 1 mL vial |
| | √ | | √ | Diphenhydramine Hydrochloride 25 mg, 12.5 mg tablets, 12.5 mg / 5 mL liquid |
| | | | √ | Droperidol (Inapsine) 5 mg / 2 ml vial |
| | | | √ | Epinephrine 1 mg / 10 mL, 1 mg / 10 mL preloaded syringe |
| √ | √ | √ | √ | Epinephrine 1 mg / 1 mL, 1 mg / 1 mL ampule (Requires special training for EMTs) |
| √ | √ | √ | √ | Epinephrine (adult and pediatric) pre-loaded auto injector |
| | √ | √ | √ | Epinephrine (Inhaled) 2.25% (Optional) |
| | | | √ | Etomidate 40 mg / 20 mL, 20 mg / 10 mL vials (Optional, requires special training) |
| | | | √ | Fentanyl Citrate (Sublimaze) 100 mcg / 2 mL vial |
| | √ | √ | √ | Glucagon (Glucagen) 1 mg for reconstitution or autoinjector |
| √ | √ | √ | √ | Glucose Oral Gel 15-25 g/tube or Tablets |
| | | | √ | Hydromorphone 1 mg / 1 mL |
| | | | √ | Hydroxycobalamin (Cyanokit) 5gram vial for reconstitution |
| | √ | √ | √ | Ibuprofen (200 mg tablets, 100 mg / 5 mL liquid) [Optional for non-transport agencies] |
| | √ | √ | √ | Ipratropium Bromide (Atrovent) 0.5 mg / 2 mL unit dose |
| | | √ | √ | IV fluids (Normal Saline, Lactated Ringers, D10W) |
| | | | √ | Ketamine 500 mg / 5 mL |
| | | √ | √ | Ketorolac (Toradol) 15 mg / 1 mL, 30 mg / 1 mL or 60 mg / 2 mL vial |
| | | | √ | Labetalol 100 mg / 20 mL |
| | | √ | √ | Lidocaine Hydrochloride 2% 100 mg / 5 ml preloaded syringe |
| | | | √ | Magnesium Sulfate 2 g in 50 mL / 100 mL, 1 g vial |
| √ | √ | √ | √ | Mark I Kit/Duodote (Atropine & Pam2chloride) pre-loaded auto injector (Optional) |
| | | | √ | Methylprednisolone (Solu-Medro) 125 mg / 2 mL Act-O-Vial |
| | | | √ | Metoprolol tartrate (Lopressor) 5 mg / 5 mL vial (Optional) (If labetalol unavailable) |
| | | | √ | Midazolam Hydrochloride (Versed) 10 mg / 2 mL vial, 5 mg / 5 mL vial |
| √ | √ | √ | √ | Naloxone Hydrochloride (Narcan) 2 mg / 2 mL pre-loaded syringe or vial, 4mg autoinjector |
| | √ | √ | √ | Nitroglycerin 0.4 mg/tab or metered spray |
| | | | √ | Nitroglycerin Paste packet |
| | | | √ | Norepinephrine 4 mg / 250 mL or 8 mg / 250 mL (Optional, requires special training) |
| | | √ | √ | Ondansetron Hydrochloride (Zofran) 4mg/2ml vial, oral dissolving tab (ODT) |
| | | | √ | Rocuronium Bromide (Zemuron) 50 mg or 100 mg vial (Optional, requires special training) |
| | | | √ | Sodium Bicarbonate 8.4% 50 mEq / 50 mL, preload syringe |
| | | | √ | Succinylcholine Chloride (Anectine) 200 mg / 10 mL vial (Optional Medication, Requires special training) |
| | | | √ | Terbutaline (Brethine) 1mg/1ml vial |
| | | | √ | Tetracaine 0.5% (Optional Medication for Non-Transport) |
| | | | √ | Tranexamic Acid (TXA) 1 g vial |
| | | | √ | Vecuronium Bromide (Norcuron) 10 mg vial-powder (Optional Medication, Requires special training) |

*Concentrations above are preferred but may require substitution based on availability and medical director approval.*

# 3.02 ACETAMINOPHEN (TYLENOL)

INDICATIONS:
1. Pain
2. Fever

CONTRAINDICATION:
1. Known allergy or hypersensitivity to Acetaminophen
2. Liver Disease
3. Inability to tolerated PO in form available (Tablet/Liquid)

PRECAUTIONS:
1. Many prescriptions and over the counter medications are compounded with Acetaminophen. Ask patient about medications they have taken in the last 6 hours prior to administration
2. Potential for aspiration with altered mental status or after febrile seizure.
3. Can be toxic in overdose. Do not administer more than 15 mg/kg or 1000 mg per dose

ADVERSE REACTIONS:
1. Nausea, Vomiting
2. Rash

SPECIAL NOTES: Optional Medication for non-transport vehicles

*Fever/Sepsis*
*Pain Management*
1. For treatment of mild to moderate pain or fever, administer **Acetaminophen** 15 mg/kg (to a max of 1000 mg per dose) PO liquid or tablet for adults and pediatric patients.
2. Can administer simultaneously with Ibuprofen.

# 3.03 ADENOSINE (ADENOCARD)

INDICATION:
1. Supraventricular tachycardia (SVT)
   a. Adults and Peds generally HR >180 BPM
   b. Infants generally HR >220 BPM

CONTRAINDICATIONS:
1. 2nd or 3rd degree heart block
2. Sick Sinus Syndrome
3. Hypersensitivity

PRECAUTIONS:
1. May worsen bronchospasm in asthmatics and some patients with COPD
2. Flushing and chest pain may occur briefly after administration
3. A reduced dose must be used in heart transplant recipients, see dosing below based on reference guideline

SPECIAL NOTES:
1. Adenosine is cleared very rapidly, half-life of less than 10 seconds, so it must be administered rapidly via the port closest to the patients, followed by at least a 20 mL saline rapid flush to ensure the entire medication has cleared the IV tubing.
2. In doses of 6-12 mg, there are usually minimal hemodynamic side effects, i.e. hypotension. Any side effects are usually very short lived
3. At the time of conversion, a variety of new rhythms may appear on the ECG. Short-lasting first degree, second degree or third-degree heart block or transient asystole may result after administration. If a rhythm other than SVT becomes evident, an alternative treatment may be indicated instead of an additional dose of Adenosine once the rhythm is further identified.
4. May use during pregnancy

*Narrow Complex Tachycardia*
1. Use for stable adult patients with suspected SVT (regular rhythm, usually >180 bpm)
2. Initial adult dose of **Adenosine** is 6 mg IV bolus. Initial pediatric dose is **Adenosine** 0.1 mg/kg (max of 6 mg) IV bolus
3. Adult second dose is **Adenosine** 12 mg IV bolus. Pediatric second dose is **Adenosine** 0.2 mg/kg (max of 12 mg) IV bolus. Provide rapid saline flush after administration
4. SPECIAL CASE: In adult heart transplant recipients, the initial dose is 4 mg. If a second dose is necessary, 8 mg may be given after online medical direction consultation.

*Wide Complex Tachycardia*
1. Use for stable pediatric patients with regular monomorphic wide complex tachycardia believed to be SVT with aberrancy
2. Initial pediatric dose of **Adenosine** is 0.1 mg/kg (max of 6 mg) IV bolus
3. Second dose of **Adenosine** is 0.2 mg/kg (max of 12 mg) IV bolus followed by rapid saline flush
4. If SVT persists after second dose of **Adenosine**, consult online medical direction for **Amiodarone** 5 mg/kg (max of 150 mg) over 20 min

# 3.04 ALBUTEROL SULFATE

INDICATIONS:
1. Acute bronchospasm
2. Known or suspected hyperkalemia

CONTRAINDICATION:
1. Allergy or known hypersensitivity to albuterol

PRECAUTIONS:
1. Rarely may produce paradoxical bronchospasm, which can be life threatening. Discontinue treatment immediately if this occurs
2. Immediate allergic reactions may occur
3. Beta receptor blocking agents will inhibit the action of Albuterol Sulfate, decreasing effectiveness
4. Use with caution in patients with cardiovascular disorders, or in patients being treated with antidepressants
5. May dilute Albuterol with Normal Saline for Pediatric dosing, see individual treatment guidelines

SPECIAL NOTES:
1. Nebulizer treatment should be administered as soon as the need is identified and continued en route rather than delaying transport to complete administration of Albuterol dose
2. Treatments for the patient with active tuberculosis or other airborne pathogens should be performed in well-ventilated areas (outside patient compartment if possible) using appropriate PPE
3. Nebulizer solution should be clear and colorless to light yellow
4. May be administered nebulized via the inline route

*Asthma/COPD*
*Allergy and Anaphylaxis*
*Burns*
1. **Albuterol Sulfate** MDI with spacer (if available) 6 Puffs, may repeat X 2
2. **Albuterol Sulfate** nebulizer 2.5 mg, may repeat X 2
3. May administer **Albuterol Sulfate** with Ipratropium Bromide, if indicated, in patients >3 years old, no repeat dosing of Ipratropium Bromide

*Cardiac Arrest* *with suspected hyperkalemia* as an adjunctive treatment
*Wide Complex Tachycardia* *with suspected hyperkalemia* as an adjunctive treatment
*Crush Syndrome* as an adjunctive treatment
1. **Albuterol Sulfate** 10 mg via nebulizer
2. Pediatric patients less than 1 year of age, **Albuterol Sulfate** 2.5 mg via nebulizer
3. Pediatric patients older than 1 year of age, **Albuterol Sulfate** 5 mg via nebulizer

# 3.05 AMIODARONE HYDROCHLORIDE (CORDARONE)

INDICATIONS:
1. Management of wide complex tachycardia, ventricular fibrillation (VF) and ventricular tachycardia (VT)

CONTRAINDICATIONS:
1. Bradycardia
2. 2nd or 3rd degree AV block
3. Torsades de points

PRECAUTIONS:
1. May prolong the QT interval

ADMINISTRATION:
1. Amiodarone may be packaged as 150 mg in 3 mL vial, 300 mg in 10 mL preload syringe, or premixed infusion. Check concentration before administration
2. Apply continuous cardiac monitoring and defibrillation pads during administration

SPECIAL NOTES:
1. May cause: Bradycardia, arrhythmias, prolonged QT, heart failure, heart block, sinus arrest
2. May cause: Coagulation abnormality, hepatic failure, adult respiratory distress syndrome
3. May cause: Visual disturbance, malaise, fatigue, nausea and vomiting

*Cardiac Arrest, Post-ROSC*
1. For adult cardiac arrest with shockable rhythm, administer initial adult dose of **Amiodarone** 300 mg IV/IO
2. Administer second dose of **Amiodarone** 150 mg IV/IO if persistent shockable rhythm after 4 minutes
3. Pediatric dose of **Amiodarone** 5 mg/kg IV/IO to maximum dose of 300 mg
4. If adult patient regains pulse prior to amiodarone administration but has received defibrillations, initiate **Amiodarone** 300 mg IV/IO infusion and give slowly over 20 minutes to prevent further arrhythmias
    a. No maintenance drip is necessary if the patient has received **Amiodarone** 300mg or more bolus during the resuscitation

*Wide Complex Tachycardia*
1. In unstable patients, use cardioversion or defibrillation prior to Amiodarone administration
2. In stable adult patients with monomorphic VT: Administer **Amiodarone** 150 mg slow IV over 10 minutes, may repeat x1 if persistent monomorphic VT
3. In stable pediatric patients with monomorphic VT: Consider discussion with Medical Direction, and administer **Amiodarone** 5 mg/kg max 150 mg slow IV over 20 minutes

# 3.06 ASPIRIN

INDICATION:
1. Suspected adult cardiac ischemia

CONTRAINDICATIONS:
1. True allergy to aspirin or other non-steroidal anti-inflammatory agents, this includes many non-aspirin/non-acetaminophen pain relievers such as Advil and Aleve
2. Pediatric patient
3. Inability to tolerate PO or chew and swallow safely

PRECAUTIONS:
1. Internal bleeding within the last 3 months
2. Known bleeding diseases (hemophilia, glucose-6-phosphate dehydrogenase deficiency)
3. Surgery within the last 8 to 10 days
4. Possibility of pregnancy or known pregnancy
5. Currently using Coumadin (Warfarin)

SPECIAL NOTES:
1. If the patient has taken aspirin within the past 8 hours, do not administer additional aspirin.
2. An expected side effect of aspirin administration is an upset stomach, which is not a reason to not give it

*Chest Pain*
1. Adults: Administer **Aspirin** 324 mg PO as 4, 81 mg chewable tablets.

# 3.07 ATROPINE SULFATE

INDICATIONS:
1. Treatment of **symptomatic** bradycardia (less than 50 beats per minute)
2. Organophosphate poisoning

PRECAUTIONS:
1. Do not give less than 0.1 mg to pediatric patients as it may cause paradoxical bradycardia

SPECIAL NOTES:
1. Atropine Sulfate may be supplied as multidose vials, prefilled syringes, or autoinjectors. Check concentration before administration
2. Atropine may not be effective in idioventricular rhythm
3. **Caution: Limit atropine use in STEMI or suspected cardiac ischemia as tachycardia may increase ischemia**
4. Avoid use of Atropine in type II second degree AV block and third-degree AV block with a new wide QRS complex. Administration of IV epinephrine or use of transcutaneous pacing is preferred
5. Transcutaneous pacing is preferred in treatment of bradycardia after ROSC in cardiac arrest patients
6. Atropine is not recommended in asymptomatic bradycardia
7. Atropine will be ineffective in the transplanted heart
8. Always consider and treat hypoxia in the setting of bradycardia

*Bradycardia*
1. Unstable adult/adolescent patient with sinus bradycardia <50 bpm: Administer **Atropine Sulfate** 1 mg IV/IO while setting up transcutaneous pacing. May repeat every 3-5 minutes to a maximum dose of 3 mg
2. Increased vagal tone in pediatric patient: Administer **Atropine Sulfate** 0.02 mg/kg IV/IO (minimum dose 0.1 mg, max single dose 0.5 mg child). May repeat every 3-5 minutes to a maximum dose of 1 mg

*Toxic Exposure/Overdose-Organophosphate/Acetylcholinesterase Inhibitor Exposure*
1. See guideline for chart listing Atropine Sulfate IM or auto-injector dosing based on exposure dose and patient age/size
2. If autoinjectors unavailable Administer **Atropine Sulfate** 1-2 mg IV/IO until signs of pulmonary secretions decrease improve, signs of atropinization occur or medication supply is exhausted
3. PEDs If autoinjectors unavailable Administer **Atropine Sulfate** 0.02 mg/kg IV/IO (minimum dose 0.1 mg, max single dose 0.5 mg child) IV/IO until signs of pulmonary secretions decrease improve, signs of atropinization occur or medication supply is exhausted

# 3.08 CALCIUM CHLORIDE 10%

INDICATION:
1. Known or suspected hyperkalemia
2. Hypocalcemia, including as a supplement to blood transfusion
3. Calcium channel blocker toxicity in extremis
4. Hydrofluoric Acid Exposure
5. Known or Suspected Hypermagnesemia in extremis

PRECAUTIONS:
1. Rapid administration of calcium may produce slowing of the cardiac rate
2. Patients taking digitalis may have increased ventricular irritability and calcium may produce digitalis toxicity. Contact medical direction for dosing in digitalis toxicity
3. Do not inject Calcium in the same line as Sodium Bicarbonate as precipitation will occur
4. Infiltration will cause tissue necrosis. Ensure adequate flow through IV prior to use. Administer in largest, most proximal IV line possible, **SLOWLY** (approximately 1 mL/min unless cardiac arrest) and only in emergency situations, monitor closely during administration

ADMINISTRATION:
1. Supplied as 1000 mg per 10 mL (100 mg/mL) prefilled syringe
2. Must be administered slowly with constant cardiac monitoring

*Toxic Exposure/Overdose*
1. Adult calcium channel blocker overdose in extremis, consider **Calcium Chloride 10%** 1,000 mg (PED dose 20 mg/kg) SLOW IV/IO over 10 minutes
2. Pediatric calcium channel blocker overdose, consider **Calcium Chloride 10%** 20 mg/kg SLOW over 10 minutes IV/IO in extremis
3. For hydrofluoric (HF) acid exposure, consider application of topical calcium preparation to exposed external skin
    A. If commercial calcium gel unavailable can combine up to 10 mL of Calcium Chloride with 5oz of water-soluble lubricant and apply to decontaminated external skin. Contact medical direction for assistance
4. For hydrofluoric acid exposure with cardiovascular collapse, consider **Calcium Chloride 10%** 1000 mg (10 mL) IV/IO SLOW for adults and 20 mg/kg SLOW IVP for pediatric patients

*Routine Trauma Guideline*
1. For crush injuries greater than 30 minutes, consider **Calcium Chloride 10%** 1,000 mg (PEDS dose 20 mg/kg) SLOW IV/IO for signs of hyperkalemia such as: peaked T-waves, prolonged QRS (greater than 0.12 seconds), absent P wave, prolonged QTc, cardiovascular collapse, ventricular irritability, or sine waves.

*Blood Transfusion Adjunct*
1. Administer **Calcium Chloride 10%** 1000 mg (10 mL) IV/IO SLOW over 10 minutes following 2nd unit of blood PEDs: 20 mg/kg (max 1 g) per medical direction

# 3.09 CALCIUM GLUCONATE 10%

INDICATION:
1. Known or suspected hyperkalemia
2. Hypocalcemia, including as a supplement to blood transfusion
3. Calcium channel blocker toxicity in extremis
4. Hydrofluoric Acid Exposure
5. Known or Suspected Hypermagnesemia in extremis

PRECAUTIONS:
1. Rapid administration of calcium may produce slowing of the cardiac rate
2. Patients taking digitalis may have increased ventricular irritability and calcium may produce digitalis toxicity. Contact medical direction for dosing in digitalis toxicity
3. Do not inject Calcium in the same line as Sodium Bicarbonate as precipitation will occur
4. Infiltration will cause tissue necrosis. Ensure adequate flow through IV prior to use. Administer in largest, most proximal IV line possible, **SLOWLY** (approximately 1 mL/min unless cardiac arrest) and only in emergency situations, monitor closely during administration

ADMINISTRATION:
1. Supplied as 1000 mg per 10 mL (100 mg/mL) vial
2. Must be administered slowly with constant cardiac monitoring

*Toxic Exposure/Overdose*
1. Adult calcium channel blocker overdose, consider **Calcium Gluconate 10%** 1g (10 mL) IV/IO SLOW over 10 minutes. May repeat q 5 minutes x 3
2. Pediatric calcium channel blocker overdose, consider **Calcium Gluconate 10%** 60 mg/kg (max 1 g) SLOW IVP in extremis
3. For hydrofluoric (HF) acid exposure, consider application of topical calcium preparation to exposed external skin
    A. If commercial calcium gel unavailable for Hydrofluoric Acid Exposure can combine up to 10 mL of Calcium Chloride with 5 oz of water-soluble lubricant and apply to decontaminated external skin. Contact medical direction for assistance
4. For hydrofluoric acid exposure with cardiac arrest, consider **Calcium Gluconate 10%** 1 g (10 mL) IV/IO SLOW for adults may repeat x 3 and 60 mg/kg SLOW IVP for pediatric patients

*Routine Trauma Guideline*
1. For crush injuries greater than 30 minutes, consider **Calcium Gluconate 10%** peds 60 mg/kg (max 1,000 mg bolus) for signs of hyperkalemia such as: peaked T-waves, Prolonged QRS (greater than 0.12 seconds), absent P wave, prolonged QTc, cardiovascular collapse, ventricular irritability or sine wave

*Blood Transfusion Adjunct*
1. Adults Administer **Calcium Gluconate 10%** 1000 mg (10 mL) IV/IO SLOW over 10 minutes following 2nd unit of Blood, PEDs 60 mg/kg max 1000 mg per medical direction

# 3.10 CEFAZOLIN (ANCEF)

INDICATION:
1. Bacterial Infection
2. Bacterial Infection Prophylaxis for suspected open fractures, traumatic amputations, large soft tissue wounds

CONTRAINDICATION:
1. Hypersensitivity

PRECAUTIONS:
1. Hypersensitivity to Penicillin. Cefazolin is a safe option in patients with documented penicillin allergies due to its unique structural characteristics. Cross reactivity between PCN and advanced generation cephalosporins is also very rare
2. Seizure Disorders

ADVERSE REACTIONS:
1. Headaches, Dizziness, Seizures
2. Rash
3. Renal Impairment
4. Nausea, Vomiting, Diarrhea
5. Anaphylaxis

ADMINISTRATION:
1. Supplied as 1 or 2 g powder. Must be reconstituted prior to administration
2. May be given as IVP diluted in 5ml sterile water over 3-5min or infusion in 100ml NS over 15-30min
3. Administration should not take precedent over life threats

Adults: 2 g IV/IO. No repeat dosing.
Pediatric Dose: 30 mg/kg, max 2 g IV/IO. No repeat dosing.

*Routine Trauma Guideline*

1. Dress **open wounds associated with fractures** with saline-moistened gauze, administer **Ancef** 2 grams (PEDS dose 30 mg/kg) as IVP diluted in 5ml sterile water over 3-5min or infusion in 100ml NS over 15-30min

# 3.11 CYANIDE ANTIDOTES

INDICATION AND USAGE:

1. If clinical suspicion of cyanide toxicity is high, Cyanide antidote should be administered without delay
2. Cyanide toxicity should be considered in patients with sudden cardiovascular collapse, especially in the appropriate context of occupational exposure (e.g., laboratory or industrial work) or in a fire victim with hemodynamic instability, or coma
3. Draw blood for analysis prior to administration if possible

Any of the following antidote kits may be used in accordance with manufacturer guidelines:

Cyanokit

1. Reconstitute 5 g vial by adding 200 mL of NORMAL SALINE to the vial by using the transfer spike
2. With the vial in the upright position, fill to the "fill line"
3. Mix the solution by rocking or rotating the vial for 30 seconds. DO NOT SHAKE
4. Use vented IV tubing and infuse as indicated below
5. The CYANOKIT should be administered through a separate/dedicated IV/IO line

Do not use below with CO/smoke exposure:
Cyanide Package/Antidote Kit
Nithiodote

Hydroxocobalamin is only agent safe for treatment of cyanide poisoning in pregnant patients

Optional medication which requires additional training prior to use

REFERENCED GUIDELINE:

*Toxic Exposure/Biologics/Overdose*

# 3.12 DEXAMETHASONE (DECADRON)

INDICATIONS:
1. Treatment of severe exacerbation of asthma, COPD
2. Treatment of acute severe allergic reactions and anaphylaxis
3. Known Adrenal Insufficiency or long-term steroid dependence, with fluid-refractory shock requiring vasopressors

CONTRAINDICATIONS:
1. Hypersensitivity
2. Systemic Fungal Infection
3. Age less than 6 years old

PRECAUTIONS:
1. Hyperglycemia

SPECIAL NOTES:
1. Typically Supplied as 10 mg / 1 mL vial
2. Requires approval as an alternative medication prior to use

*Allergy & Anaphylaxis*
*Asthma/COPD*
1. Consider **Dexamethasone (Decadron)** 10 mg IV/IO/IM, adult. Pediatric dose: **Dexamethasone (Decadron)** 0.6 mg/kg IV/IO/IM to maximum dose of 10 mg

*Hypovolemia and Shock*
1. If the patient has a history of adrenal insufficiency or long-term steroid dependence, presenting with fluid-refractory shock requiring vasopressors, consider **Dexamethasone (Decadron)** 10mg IV/IO/IM, adult. Pediatric dose: **Dexamethasone (Decadron)** 0.6 mg/kg IV/IO/IM to maximum dose of 10 mg

# 3.13 DEXTROSE

INDICATION:
1. Suspected or known hypoglycemia (blood sugars of <70 mg/dL, neonates <45 mg/dL) in a patient that is unable to tolerate oral dextrose or is in shock

PRECAUTIONS:
1. Dextrose extravasation at any concentration can cause tissue necrosis. Ensure proper IV/IO patency prior to infusion and monitor IV/IO sites closely during administration
2. **IO Dextrose should only be administered if the patient is in extremis**

SPECIAL NOTES:
1. Perform blood glucose measurement. For an accurate reading, capillary blood should be used; however venous blood can be used and will be about 10% lower
2. Advanced level services: In patients with blood sugar of <70 mg/dL, IV dextrose and/or glucagon are considered first/second line treatment
3. All patients whose hypoglycemia is due to oral hypoglycemic agents should be monitored by family member and be given something to eat with high carbohydrate and protein content if they are refusing transport to the hospital
4. Patients with overdose of insulin, intentional or otherwise, should be transported to the hospital
5. All patients that are hypoglycemic and on sulfonylureas must be transported due to rebound hypoglycemia
6. Label all dilution bags or syringes with contents and concentration

*Diabetic Emergencies*, *Altered Level of Consciousness*

Pre-mixed **Dextrose 10% (D10)** dosing:
- Adult: 12.5 grams (125 mL) IV/IO, may repeat as needed
- PEDS: 5 mL/kg to max of 12.5 grams (125 mL) IV/IO, may repeat as needed
- Neonates: 2 mL/kg infusion, encourage breastfeeding in stable patients, goal to maintain blood sugar > 45 mg/dL

Preparation of D10 from **Dextrose 50% (D50)** when D10 is on shortage and 100ml or 250ml bags of 0.9 NS are available:
- Instill 25 mL of D50 into a 100 mL 0.9% NS bag (this makes 125 mL of D10 with 12.5 grams of dextrose in 125 mL of NS)

OR
- Draw out and waste 50ml of NS from a 250 mL 0.9% NS bag, then Instill 50 mL of D50 into the NS bag (this makes 250 mL of D10 with 25 grams of dextrose in 250 mL of NS)

Alternative dextrose administration when D10 and 100/250 mL bags of 0.9% NS on shortage:
1. Dextrose 50% will be authorized for patients 12 years old and greater
2. **Dextrose 25% (D25)** will be authorized for patients 1-11 years old
3. **Dextrose 12.5% (D12.5)** will be authorized for children less than 1 year of age
4. Administer as per below
   - Patients ≥ 12 years old:
     - If utilizing Dextrose 50%, administer 12.5 grams (25 mL), may repeat x 1
     - If utilizing Dextrose 25%, administer 5 grams (20 mL) increments and recheck blood sugar, may repeat as needed
   - Patients 1-11 years old:
     - If utilizing Dextrose 25% (2.5 grams per 10ml), administer 2 mL/kg IV per dose
     - If utilizing D50, prepare D25 from D50: Mix equal volumes of D50 with 0.9% NS (eg: using 20ml syringe), then administer 2 mL/kg IV per dose
     - May repeat the 2 ml/Kg dose as needed

- Patients < 1 year of age:
  - Administer Dextrose 12.5%, initial dose 2 mL/kg to maintain BG > 50 mg/dL, may repeat as needed
  - Dextrose 50% must be diluted with equal parts 0.9% NS twice to obtain a concentration of 12.5% OR
  - Dextrose 25% must be diluted once with 0.9% NS to obtain a concentration of 12.5%
- For any questions regarding preparation, dosing, or management, contact online medical direction

# 3.14 DILTIAZEM (CARDIZEM)

INDICATIONS:
1. Adult Stable, Symptomatic Atrial fibrillation or atrial flutter with Rapid Ventricular Response with:
    1. HR >130 BPM
    2. SBP >110 mmHg
2. Treatment of other types of supraventricular tachycardia following consultation with online medical direction.

CONTRAINDICATIONS:
1. Rate control of Atrial Fibrillation with rapid ventricular response that is a physiologic response (ex. Fever, hypoxia, shock)
2. Sick sinus syndrome
2. Second- or third-degree AV block
3. HR <130 BPM
3. SBP <110 mmHg, cardiogenic shock or heart failure
4. Patients who have demonstrated hypersensitivity to the drug
5. Wolf-Parkinson-White (WPW) syndrome
6. Ventricular tachycardia
8. Pediatric patients

PRECAUTIONS:
1. Symptomatic hypotension may result. Administer **SLOWLY** over approximately 5 minutes
2. PVCs may be present on conversion of PSVT to sinus rhythm. They are transient and typically benign
3. Use cautiously in patients with renal failure, congestive heart failure
4. Patients currently taking or who have been given a Beta-Blocker

SPECIAL NOTES:
1. Refer to calcium channel blocker overdose in Toxic Exposure/Overdose guideline if the patient becomes hemodynamically or clinically unstable
2. May require refrigeration or reconstitution

*Narrow Complex Tachycardia*
1. Stable and Rapid Atrial Fibrillation/Flutter if causing significant palpitations or dizziness
2. For HR >130 and SBP >110 mmHg, if available, consider Diltiazem (Cardizem) 0.25 mg/kg (max dose is 20 mg) IV SLOW over 5 min can be given
    1. If inadequate response after 15 minutes, may re-bolus at 0.25 mg/kg (max dose 20mg) IV SLOW over 5 minutes. Hold if hypotensive.
    2. For patients older than 50 years of age, blood pressure (SBP 110-120 mmHg), known renal failure, or CHF, initial bolus 5–10 mg administered IV over 2 minutes
    3. For patients older than 65 years old, recommend maximum initial dose of diltiazem 10 mg IV and a maximum second dose of 20 mg

# 3.15 DIPHENHYDRAMINE HYDROCHLORIDE (BENADRYL)

INDICATIONS:
1. Anaphylaxis, as an adjunct to epinephrine
2. Allergic reactions
3. Treatment or prevention of extrapyramidal symptoms

CONTRAINDICATIONS:
1. Allergy or known hypersensitivity to Diphenhydramine HCl
2. Inability to tolerate PO in form available (Tablet/Liquid)

PRECAUTIONS:
1. Use cautiously in children, as overdose may cause hallucinations, convulsions, or death
2. Antihistamines may cause dizziness, sedation, urinary retention and hypotension
3. Benadryl is an antihistamine with anticholinergic and sedative side effects, including dizziness, epigastric distress, and thickening of bronchial secretions
4. Benadryl has an atropine-like action, therefore use with avoid in patients with active bronchial asthma, hyperthyroidism, cardiovascular disease, hypertension, and COPD
5. Age less than 2 years old

SPECIAL NOTES:
1. Injectable Benadryl has a rapid onset of action
2. IV route is preferred. IM route can be used if unable to establish an IV and patient unable to tolerate PO

ADVERSE REACTIONS:
1. Sedation, dizziness, epigastric distress, urinary retention and thickening of bronchial secretion

*Allergic & Anaphylaxis*
1. Adults: Administer **Diphenhydramine** 50 mg IV, IM, PO. Pediatric dose is 1 mg/kg to a maximum of 50 mg
2. May use OTC **Diphenhydramine** liquid 12.5 mg / 5 mL for those >1y/o with extensive hives

*Nausea, Vertigo, Vomiting*
1. If extrapyramidal or dystonic symptoms, give **Diphenhydramine** 50 mg IM or IV. Pediatric dose: **Diphenhydramine** 1 mg/kg IM or IV. Max dose of 50 mg

# 3.16 DROPERIDOL (INAPSINE)

INDICATIONS:
1. Acute anxiety and /or agitation
2. Refractory acute nausea and vomiting, known history of cyclic vomiting syndrome or cannabis hyperemesis syndrome

CONTRAINDICATIONS:
1. Known prolonged QT interval
2. Known history of hypersensitivity
3. Agitation associated with Dementia
4. Pediatrics

PRECAUTIONS:
1. Consider half dose for critically ill or injured patients, as well as patients age > 65 years old
2. May prolong QT interval, especially in combination with other QT prolonging medications (e.g. Zofran), monitor and consider 12-lead EKG

ADMINISTRATION:
1. Ensure adequate access to airway and all resuscitation and monitoring equipment is immediately available prior to administration
2. Target highest possible IMCRASS score to safely care for patient
3. May require 10-20 minutes for full effect when given IM
4. Apply continuous EKG, $EtCO_2$, $SpO_2$ monitoring as soon as safe based on patient agitation

SPECIAL NOTES:
1. Effects include alpha-adrenergic blockade and peripheral vascular dilation which may result in hypotension
2. If rare extrapyramidal effects are observed, Benadryl can be given

*Agitated, Anxious, Combative and Violent*
IMCRASS Score 3+/4+:
- Consider administration of Droperidol 10 mg IM for adult patients.

IMCRASS Score = +2:
- Consider administration of Droperidol 5 mg IM, adults only.

*Nausea, Vertigo, Vomiting*
Adults: consider administration of Droperidol 1.25 mg IM (or IV slowly over 2 min) for acute nausea and vomiting refractory to Zofran, known history of cyclic vomiting syndrome or cannabis hyperemesis syndrome.

# 3.17 EPINEPHRINE 1 MG / 1 ML

INDICATIONS:
1. Anaphylaxis with evidence of severe respiratory distress, hives, and/or decreased blood pressure
2. Severe asthma
3. For Nebulized administration in stridor
4. Source dose for dilutional use in epinephrine infusion

CONTRAINDICATIONS:
1. Hypersensitivity

ADVERSE EFFECTS:
1. Hypertension
2. Tachydysrhythmias
3. Ischemia
4. Anxiety

PRECAUTIONS:
1. Do not use in patients with asthma exacerbation over the age of 55 or with known cardiac disease without physician order
2. Administration via peripheral vascular access should be closely monitored for signs of infiltration/extravasation. If signs infiltration/extravasation noted, discontinue infusion and notify receiving facility
3. Patients who are hypotensive from acute hemorrhage or hypovolemia. Initiate volume replacement
4. Do not give cardiac arrest doses (1mg) to patients with a pulse
5. Treatment for hypotension due to acute hemorrhage or hypovolemia should include volume replacement

SPECIAL NOTES:
1. Extravasation/Infiltration may cause injury, continually assess for patency and administer through largest vein/IO
2. Administration requires frequent blood pressure monitoring and continuous cardiac monitoring
3. May precipitate in IV tubing with sodium bicarbonate if tubing is not flushed between drugs
4. Possible limited effect in patients taking beta blocking or calcium channel blocking drugs
5. Consider obstructive shock
6. Supplied in ampule or vial, 1 mg/mL, verify concentration prior to use. May also be supplied as auto-injector with fixed dose administration
7. May be diluted for use as described in *Hypovolemia and Shock Guidelines*
8. Additional concentrations may be supplied for interfacility transport

*Allergic & Anaphylaxis*
1. Adult dose: **Epinephrine** 0.5 mg IM or auto-injector **Epinephrine** 0.3 mg IM
2. Pediatric dose: **Epinephrine** 0.01 mg/kg IM (max dose 0.5 mg) or pediatric auto-injector **Epinephrine** 0.15 mg IM

*Asthma*
1. Adult Status Asthmaticus unresponsive to nebs with impending respiratory failure give **Epinephrine** 0.5 mg IM
2. Pediatric dose: **Epinephrine** 0.01 mg/kg IM. Maximum dose of 0.5 mg

*Stridor: See Epinephrine Inhaled*

# 3.18 EPINEPHRINE 1 MG / 10 ML

INDICATION:
1. Cardiac Arrest
2. For Nebulized administration in stridor
3. Source dose for dilutional use in epinephrine infusion.
4. Pediatric Bradycardia

CONTRAINDICATIONS:
1. Hypersensitivity

ADVERSE EFFECTS:
1. Hypertension
2. Tachydysrhythmias
3. Ischemia
4. Anxiety

PRECAUTIONS:
1. Do not use in patients with asthma exacerbation over the age of 55 or with known cardiac disease without physician order
2. Administration via peripheral vascular access should be closely monitored for signs of infiltration/extravasation. If signs infiltration/extravasation noted, discontinue infusion and notify receiving facility
3. Patients who are hypotensive from acute hemorrhage or hypovolemia. Initiate volume replacement
4. Do not give cardiac arrest doses (1 mg) to patients with a pulse

SPECIAL NOTES:
1. Extravasation/Infiltration may cause injury, continually assess for patency and administer through largest vein/IO
2. Administration requires frequent blood pressure monitoring and continuous cardiac monitoring
3. May precipitate in IV tubing with sodium bicarbonate if tubing is not flushed between drugs
4. Possible limited effect in patients taking beta blocking or calcium channel blocking drugs
5. Consider obstructive shock
6. Supplied in ampule or vial, 1 mg / 10 mL, verify concentration prior to use.
7. May be given via ETT in neonatal resuscitation
8. May be diluted for use as during *Hypovolemia and Shock,* see procedure in *Epinephrine push dose and drip*
9. Additional concentrations may be supplied for interfacility transport

*Cardiac Arrest*
1. **Epinephrine** 1 mg IV/IO initially and then repeat every 5 minutes
2. Pediatric dose: **Epinephrine** 0.01mg/kg IV/IO. Maximum dose 1mg, repeat every 5 minutes as needed

*Unstable Bradycardia*
1. For unstable pediatric bradycardia, administer **Epinephrine** 0.01 mg/kg (0.1 mL/kg) IV/IO

*Respiratory Distress*
1. For severe bronchospasms in an intubated adult patient, **Epinephrine** 1 mg may be given directly in the ETT to improve compliance with ventilation. This is an extreme circumstance in an unstable peri-arrest patient only

*Stridor: See Epinephrine Inhaled*

# 3.19 EPINEPHRINE AUTOINJECTOR

INDICATIONS:
1. Severe allergic reaction from stings, and ingested, inhaled, injected, or absorbed allergens
2. Anaphylaxis with evidence of severe respiratory distress, hives, and/or decreased blood pressure
3. Severe asthma

CONTRAINDICATION:
1. None for anaphylaxis

PRECAUTIONS:
1. Do not use in patients with asthma exacerbation over the age of 55 or with known cardiac disease without physician order

SPECIAL NOTES:
1. Supplied in Adult and Pediatric Autoinjector, verify dose prior to use

*Allergic & Anaphylaxis*
1. **Adult Dose: Adult Epinephrine Autoinjector** IM 0.3 mg for **>66lbs/30kg)**
2. Pediatric Dose: Pediatric Epinephrine Autoinjector 0.15 mg for <66lbs/30kg
3. Repeat in consultation with Medical Direction x 1

*Asthma & COPD*
Status Asthmaticus unresponsive to nebs with impending respiratory failure
1. **Adult Dose: Adult Epinephrine Autoinjector** IM 0.3mg for **>66lbs/30kg)**
2. Pediatric Dose: Pediatric Epinephrine Autoinjector 0.15 mg for <66lbs/30kg

# 3.20 EPINEPHRINE (INHALED)

INDICATIONS:
1. Respiratory distress with stridor at rest
2. Severe Croup
3. Anaphylaxis in conjunction with IM Epinephrine
4. Severe bronchospasm in intubated patient

CONTRAINDICATIONS:
1. Known allergy or hypersensitivity to Epinephrine
2. Congenital heart problems

PRECAUTIONS:
1. Alternative cause of stridor should be considered, including:
    a. Airway Obstruction (choking)
    b. Aspiration
    c. Epiglottitis
2. Not to be used as a substitute for clearly indicated airway interventions
3. Do not use in patients over the age of 55 or with known cardiac disease without physician order
4. May worsen pre-existing glaucoma if it gets in the eyes. Have the patient close their eyes during nebulization

ADMINISTRATION:
1. Cardiac Monitoring indicated, discontinue for cardiac arrythmias

SIDE EFFECTS:
1. Nervousness/Tremors
2. Palpitations, Arrhythmias, Tachycardia
3. Flushing/Diaphoresis
4. Chest Discomfort
5. Dizziness/Headache

*Respiratory Distress - Stridor*
1. Pediatric: 1 mL of **Epinephrine** 1 mg / 1 mL mixed with 2 mL of normal saline in pediatric nebulizer connected to oxygen source at 6 LPM
2. Adult: **Epinephrine** 0.3 mg (3 mL of Epinephrine 1 mg / 10 mL) in adult nebulizer connected to oxygen source at 6 LPM
3. **Racemic epinephrine** 0.5 mL of 2.25%
    1. Adults 0.5 mL diluted with 3 mL Saline
    2. Pediatric: 0.05 mL/kg max 0.5 mL diluted to 3 mL with NS

# 3.21 ERTAPENEM (INVANZ)

INDICATIONS:
1. Bacterial Infection
2. Bacterial Infection Prophylaxis for indications such as suspected open fractures, traumatic amputations, large soft tissue wounds
3. Alternative to Cefazolin in patients with a history of Cephalosporin Allergy with bacterial infection or need for infection prophylaxis

CONTRAINDICATION:
1. Hypersensitivity

PRECAUTIONS:
1. Seizure Disorders

ADVERSE REACTIONS:
1. Headaches, Dizziness, Seizures
2. Rash
3. Nausea, Vomiting, Diarrhea
4. Anaphylaxis

ADMINISTRATION:
1. Supplied as 1 g powder. Must be reconstituted prior to administration as a slow infusion. Do not reconstitute with dextrose containing fluids
2. Administration should not take precedent over life threats
3. Medication requires special training and approval prior to use
4. Reduce Dose by 50% for known renal impairment

Adults Dose 1 g IV/IO. No repeat dosing
Pediatric Dose 15 mg/kg, max 1 g IV/IO. No repeat dosing

# 3.22 ETOMIDATE (AMIDATE)

INDICATION:
1. Sedation prior to paralysis for rapid sequence airway placement in credentialed RSA personnel

CONTRAINDICATIONS:
1. Hypersensitivity
2. Age less than 10 years old
3. Hypotension

PRECAUTIONS:
1. May cause skeletal muscle movements and masseter muscle spasm, laryngospasm

SPECIAL NOTES:
1. Intravenous injection of etomidate produces rapid onset of hypnosis, with brief duration of 3 to 5 minutes
2. Only administer when all equipment and personnel are ready for intubation
3. Be prepared to administer additional analgesia/sedation after intubation due to short half-life
4. Optional medication that requires special training and credentialing prior to use

*RAPID SEQUENCE AIRWAY PROCEDURE*
1. Administer for induction in patients >10 years old during RSA procedure, Etomidate 0.3 mg/kg IV/IO to maximum of 30 mg. Typical adult dose is 20 mg

# 3.23 FENTANYL CITRATE (SUBLIMAZE)

INDICATIONS:
1. Temporary relief of pain
2. Treatment of expected pain during, transcutaneous pacing, synchronized cardioversion and RSA procedures

CONTRAINDICATIONS:
1. Hypersensitivity to opiates
2. Myasthenia gravis
3. Respiratory depression without a secure airway

PRECAUTIONS:
1. Hypotension
2. Elderly patients
2. Opioid Naive
3. History of seizure disorders
4. Rapid administration can cause respiratory muscle rigidity
5. Concurrent use of CNS, Cardio/Respiratory depressant medications can lead to over sedation or respiratory arrest
6. Bowel Ileus/Obstruction may be worsened by administration of narcotic pain medications

SPECIAL NOTES:
1. Supplied in a vial containing 100 mcg / 2 mL
2. This medication is a controlled substance. Organization drug control measures and EMS system guidelines should be followed closely

*Pain Management*
1. Adult: **Fentanyl Citrate** 50-100 mcg IV/IM/IO/IN. May repeat x 1 in 10 minutes if indicated to maximum total dose of 200 mcg. Consider IN dosing in patient populations when an IV is not otherwise indicated. Reduce dose by 50% for smaller-framed or elderly patients
2. Pediatric: **Fentanyl Citrate** 1 mcg/kg IV/IO or 2 mcg/kg IN. Maximum dose 100 mcg per dose. Repeat x 1 in 10 minutes if indicated. Intranasal route preferred in pediatric patients where IV access may be problematic

# 3.24 GLUCAGON (GLUCAGEN)

INDICATIONS:
1. Suspected or known hypoglycemia in diabetic patients when IV access is not available and oral glucose is contraindicated
2. Beta Blocker overdose or ineffective response to Epinephrine when patient is taking a beta blocker
3. Calcium channel blocker overdose adjunct

CONTRAINDICATION:
1. Allergy or known hypersensitivity to glucagon

SIDE EFFECTS:
1. Nausea and vomiting
2. My cause transient increase in blood pressure and pulse rate

SPECIAL NOTES:
1. Glucagon is provided as one unit (1 mg) of powdered glucagon with a vial containing 1 mL of diluting solution (must use diluent packed with medication)
2. Glucagon Autoinjector may be utilized by EMRs as an optional medication for hypoglycemia as above
3. For hypoglycemia (blood sugar <70 mg/dL), dextrose IV is treatment of choice
4. For conscious patients, simple, oral carbohydrates are most effective at increasing blood sugar
5. If patient has already been given glucagon, a second dose may be given if unconscious after 15 minutes

*Allergy & Anaphylaxis*
1. Adult: Consider **Glucagon** 2 mg IV/IO if the patient is taking Beta Blockers and is not responding to Epinephrine. Repeat every 10 minutes until response or glucagon depleted

*Diabetic Emergencies*
1. Adult: Give **Glucagon** 1 mg IM, May repeat x1 in 15min
   Pediatric patient under 20 kg: Give **Glucagon** 0.5 mg IM. May repeat x1 in 15min

*Toxic Exposure/Overdose*
1. Beta-Blocker or Calcium Channel Blocker Overdose with hypotension or bradycardia: Consider **Glucagon** 2 mg slow IVP for adults and 0.1 mg/kg pediatrics. May repeat every 3 min up to 5 mg total for adults and 3 mg total for pediatrics (if available)

# 3.25 GLUCOSE ORAL GEL OR TABLETS

INDICATIONS:
1. Suspected, anticipated or known hypoglycemia (blood sugars of <70 mg/dL)
2. To support thermogenesis in a hypothermic patient

SPECIAL NOTES:
1. Common formulations include gel containing 15-25 g glucose per tube and tablets containing 4 g per tablet
2. ILS/ALS services: Not a substitute for IV dextrose in cases of significant hypoglycemia

*Diabetic Emergencies*
1. For blood sugar < 70 mg/dL in a conscious patient with intact gag reflex, give Glucose oral gel or tablet PO. Adult: **Glucose** 25 g. Pediatric: Glucose 0.5–1 g/kg

*Hypothermia & Frostbite*
1. Support thermogenesis by giving the patient warm fluids and calories and consider administration of Glucose oral gel or tablets

# 3.26 HALOPERIDOL (HALDOL)

INDICATIONS:
1. Acute anxiety and/or agitation
2. Refractory acute nausea and vomiting, known history of cyclic vomiting syndrome or cannabis hyperemesis syndrome

CONTRAINDICATIONS:
1. Known prolonged QT interval
2. Known history of hypersensitivity
3. Agitation associated with Dementia
4. Pediatrics

PRECAUTIONS:
1. **Consider half dose for critically ill or injured patients, as well as patients age > 65 years old**
2. May prolong QT interval, especially in combination with other QT prolonging medications (e.g.: Zofran), monitor and consider 12-lead EKG

ADMINISTRATION:
1. Ensure adequate access to airway and all resuscitation and monitoring equipment is immediately available prior to administration
2. Target highest possible IMCRASS score to safely care for patient
3. May require 10-20 minutes for full effect when given IM
4. Apply continuous EKG, $EtCO_2$, $SpO_2$ monitoring as soon as safe based on patient agitation
5. May administer with Versed and Diphenhydramine

SPECIAL NOTES:
1. Effects include alpha-adrenergic blockade and peripheral vascular dilation which may result in hypotension
2. If rare extrapyramidal effects are observed, Benadryl can be given

*Agitated, Anxious, Combative and Violent*

IMCRASS 4+
- Consider administration of Haloperidol 5-10 mg IM for adult patients. Consider administration with 50mg IM Diphenhydramine and 2.5-5 mg IM Versed.

IMCRASS 3+
- Consider administration of Haloperidol 5-10 mg IM for adult patients. Consider administration with 50mg IM Diphenhydramine.

IMCRASS 2+:
- Consider administration of Haloperidol 2.5-5 mg IM for adult patients.

# 3.27 HYDROMORPHONE (DILAUDID)

INDICATION:
1. Adult Moderate to Severe Pain

CONTRAINDICATIONS:
1. Allergy or known hypersensitivity
2. Hypotension
3. Respiratory Depression

PRECAUTIONS:
1. Elderly patients
2. Opioid naïve
3. Concurrent use of other CNS, Cardio/Respiratory depressing drugs
4. Bowel Ileus/Obstruction

ADMINISTRATION:
1. Attach tubex or carpujet to pre-filled 1 mg / 1 mL as applicable
2. Attach to needles port of IV tubing or attach needle for IM injection
3. Usual dose Adult 0.5-1 mg IV/IO/IM, may repeat in 20 minutes-max dose 3 mg
4. Monitor and treat for respiratory depression & hypotension

SPECIAL NOTES:
1. Not to be used for pediatric patients
2. Reduce dose by 50% for smaller framed and elderly
3. 1 mg Hydromorphone is equal to approximately 8mg morphine
4. Monitor for and treat respiratory depression & hypotension
5. Controlled Substance and your organizational drug control measures and EMS system guidelines should be followed closely

*Pain Management*
1. Adult dose: **Hydromorphone (Dilaudid)** 0.5-1 mg IV/IO/IM. May repeat dose in 20 minutes. Maximum total dose 3 mg

# 3.28 IBUPROFEN (MOTRIN, ADVIL)

INDICATION:
1. Treatment of mild to moderate pain
2. Reduction of fever

CONTRAINDICATION:
1. Known allergy or hypersensitivity to Non-Steroidal Anti-Inflammatory medications (NSAIDS) – including Motrin or Advil (Ibuprofen), Aleve (Naproxen), Toradol (Ketorolac)
2. Active hemorrhage
3. Concern for intracranial hemorrhage due to trauma or active stroke
4. Under the age of 6 months
5. Current use of blood thinning agent Coumadin (Warfarin), Xarelto (Rivaroxaban), Eliquis (Apixaban), Aspirin
6. If other NSAID including Motrin or Advil (Ibuprofen), Aleve (Naproxen), Toradol (Ketorolac) has been administered within 6 hours
7. Shock, Dehydration or hypotension
8. Known or suspected renal insufficiency
9. History of GI bleeding
10. CHF
11. Inability to tolerate PO in available product (Tablet, Liquid)
12. Pregnancy or breast feeding

PRECAUTIONS:
1. Potential for aspiration with AMS or post febrile seizure.
2. Asthma

ADMINISTRATION:
1. Adults and Pediatrics: Dose 10 mg/kg to a max of 400 mg per dose
2. PO tablet or liquid
3. Can be administered with acetaminophen

ADVERSE REACTIONS:
1. GI Bleeding
2. Nausea/Vomiting
3. Headache

SPECIAL NOTES: Optional Medication for non-transport vehicles

*Fever/Sepsis*
*Pain Management*
1. Patients > 6 months of age: **Ibuprofen** PO 10mg/kg to a maximum of 400 mg per dose

# 3.29 IPRATROPIUM BROMIDE (ATROVENT)

INDICATION:
1. Asthma and COPD
2. Adjunct to organophosphate poisoning

CONTRAINDICATIONS:
1. Allergy or known hypersensitivity.
2. Known peanut or soy allergy
3. Hypersensitivity to atropine (chemically related)

PRECAUTIONS:
1. Use with caution in patients with heart disease, hypertension, glaucoma, and the elderly
2. May worsen the condition of glaucoma if it gets in the eyes. *Have the patient close their eyes during nebulization*
3. Common side effects include cough, dry mouth, or unpleasant taste
4. Less common side effects include vision changes, eye burning or pain, dizziness, headache, nausea, nervousness, palpitations, sweating, trembling, increased wheezing or dyspnea, chest tightness, rash, hives, or facial swelling
5. Must contact online medical direction for use in patients under 3 years of age

PEDIATRIC CONSIDERATIONS:
1. Atrovent is not indicated in routine childhood asthma. Contact online medical direction if considering the use of Atrovent
2. Ipratropium should not be given in suspected pediatric bronchiolitis

SPECIAL NOTES:
1. For active bronchospasm, Ipratropium is only used in combination with albuterol.
2. Nebulizer treatments for patients with potential infectious respiratory diseases should be performed in well-ventilated areas (outside patient compartment if possible) with appropriate PPE.
3. May be administered nebulized via the inline route

*Toxic Exposure/Overdose*
*Asthma/COPD*
1. Mix **Albuterol Sulfate** 2.5 mg in 3 mL with **Ipratropium Bromide (Atrovent)** 0.5 mg in 2 mL in nebulizer reservoir. Allow the patient to inhale vapor via handheld nebulizer, mask, or in-line nebulizer

# 3.30 KETAMINE (KETALAR)

INDICATIONS:
1. Dissociation for RSA
2. Dissociation for extreme agitation, combative, refractory to non-pharmacologic interventions
3. Dissociation for post intubation
4. Severe Pain

PRECAUTIONS:
1. Can cause respiratory depression/hypotension/laryngospasm, ensure administered **SLOW** if given IV/IO
2. Can cause extra secretions in the airway
3. Can cause emergence reactions
4. Pediatrics
5. Pregnancy
6. Consider Lower dose for:
    a. Hypertension
    b. Tachycardia
    c. Critically ill or injured
    d. Elderly/Frail
    e. SBP <100 mmHg

CONTRAINDICATIONS:
1. Cardiac decompensation
2. Hypersensitivity
3. Hypertensive Emergency- Withhold if increasing blood pressure poses a serious hazard

SPECIAL NOTES:
1. For emergence reactions, consider titrating **Versed** up to 2 mg (PEDS dose 0.05 mg/kg) IV/IO/IN/IM to treat mild to moderate agitation every 5 minutes as needed, max of 10 mg total all doses, be cautious of paradoxical effect
2. Generally avoid in pregnancy, discuss with medical direction prior to use in pregnancy
3. Ensure adequate access to airway and all resuscitation and monitoring equipment is immediately available prior to administration
4. Target highest possible IMCRASS score to safely care for patient for appropriate sedation

*Agitated, Anxious, Combative and Violent*
*Rapid Sequence Airway procedure*
*Sedation Post ROSC with a Secure Airway*
1. For initial dissociation, administer **Ketamine** 1 mg/kg slow push via IV/IO. Max dose 100 mg.
2. If IV/IO access is not available or is unsafe to obtain, administer **Ketamine** 4 mg/kg IM, Maximum dose 400 mg.
3. Repeat dose of Ketamine 0.5-1 mg/kg IV/IO as needed to maintain adequate dissociation, max dose 100mg per bolus.

*Pain Management*
1. For severe pain unresponsive to opioids, administer **Ketamine** 0.25 mg/kg IV/IM, max dose 25 mg.
2. For extreme pain dissociation with obvious severe traumatic injuries consider high dose or per **Medical Direction**, 1 mg/kg **SLOW** IV (max dose 100 mg) or 4 mg/kg IM (Adults Only), max dose 400 mg.

# 3.31 LABETALOL (TRANDATE)

INDICATION:
1. Hypertensive emergency in adults
2. Adjunct to Eclampsia and Preeclampsia

CONTRAINDICATIONS:
1. HR <60 BPM
2. AV block - second or third degree
3. Hypotension
4. Cardiogenic shock
5. Acute COPD or Asthma

PRECAUTIONS:
1. Use cautiously in elderly, hepatic or renal disease (increased risk of toxicity)
2. Bronchospastic disease (may aggravate)
3. Insulin dependent diabetes (may mask hypoglycemia)
4. May potentiate AV conduction delay in patients on Digitalis

SPECIAL NOTES:
1. Supplied in 100 mg / 20 mL vial
2. May be provided as an infusion of varying concentration during interfacility transport, check concentration and dosage prior to administration

*Eclampsia Pre-Eclampsia*

1. For ongoing Hypertension of SBP >160 mmHg and DBP >110 mmHg following Magnesium Infusion in Pre-eclampsia or Hypertension in a Pregnant Patient >20 weeks
    a. Consider **Labetalol** 10 mg IVP over 2 min, if no effect, may repeat 20 mg IVP in 10 min to a max of 100 mg

*Hypertensive Crisis*

1. **Labetalol** 10 mg IVP over 2 min to reduce blood pressure by 20% or alleviate symptoms of end organ dysfunction. If inadequate effect, may repeat Labetalol 20 mg IVP every 10 min to a maximum of 100 mg

# 3.32 LIDOCAINE HYDROCHLORIDE 2%

INDICATION:
1. Reduce pain of EZ-IO infusion
2. Alternative to Amiodarone for treatment of ventricular arrythmia during cardiac arrest

CONTRAINDICATION:
1. Allergy or known hypersensitivity to lidocaine.

PRECAUTIONS (Specific with Cardiac Arrest Dosing):
1. Second-degree heart block (Mobitz II) or third degree (complete) heart block in the absence of an artificial pacemaker
2. Junctional bradycardia
3. Ventricular ectopy associated with bradycardia
4. Idioventricular or escape rhythms
5. Dysrhythmias associated with cocaine use/abuse and hypothermia.

SPECIAL NOTES:
1. Observe for symptoms of toxicity such as seizures
2. Must use preservative free formulations
3. Supplied as Lidocaine 2%, 100 mg / 5 mL preloaded syringe

*EZ-IO Procedure*
1. May consider administration of **2% Lidocaine** 40 mg SLOWLY into IO over 2 minutes. Allow Lidocaine to dwell for 60 seconds (do not administer any other fluid or medication during this time) prior to administering a rapid saline flush of at least 10 mL
2. PEDs dose is 0.5 mg/kg maximum dose 20 mg

*Cardiac Arrest*
1. Alternative to Amiodarone in Adult and Pediatric Cardiac Arrest at 1-1.5 mg/kg (Max 100 mg) for initial dose and 0.5 mg/kg (max 50 mg) IV/IO for a second dose if required. May repeat every 5 min as needed (max dose 3 mg/kg)

# 3.33 MAGNESIUM SULFATE

INDICATIONS:
1. Recurrent ventricular tachycardia, Torsades de pointes, or persistent ventricular fibrillation
2. Eclampsia
3. Status Asthmaticus/Severe COPD Exacerbation

CONTRAINDICATION:
1. 2nd or 3rd Degree Heart blocks

PRECAUTIONS:
1. Use cautiously in patients with impaired renal function
2. Pediatric Magnesium Infusion without an IV pump
3. Myasthenia Gravis or other neuromuscular disease
4. Hypotension

SPECIAL NOTES:
1. Observe for symptoms of toxicity such as: Reduced Reflexes, Hypotension, Cardiac Conduction abnormalities or Respiratory failure. If signs of toxicity are observed, stop infusion and administer **Calcium Chloride** 500 mg IV/IO slowly over 5 minutes. PEDs dose 10 mg/kg, max 500 mg, IV/IO slowly over 500 mg or Calcium Gluconate 1 g over 5 minutes (PEDs dose 50 mg/kg max dose 2 g)
2. May cause flushing, sweating, warm sensation specifically with rapid administration.
3. Supplied as Vial or Bag, check concentration and dose prior to administration

*Asthma/COPD*
1. Consider **Magnesium Sulfate** 2 g IV/IO administered as a 10-minute infusion. Pediatric dose: Magnesium Sulfate 50 mg/kg IV/IO as 10-minute infusion. No repeat dose

*Cardiac Arrest*
1. Treatment of refractory VF or Torsades de pointes, consider **Magnesium Sulfate** 2 g IV/IO administered over 1-2 minutes. Pediatric dose: Magnesium Sulfate 50 mg/kg IV/IO to a maximum dose of 2 g

*Pregnancy + Hypertension with Severe Features or Eclampsia*
1. Administer Magnesium Sulfate 4 g IVPB over 20 min with primary IV running wide open during administration

*Wide Complex Tachycardia*
1. In stable patients with polymorphic VT, Torsades de pointes, or tachycardia with QTC > 500 ms, consider administration of **Magnesium Sulfate** 2 g IV/IO as an infusion over 10 minutes

# 3.34 MARK I KIT/DUODOTE

INDICATION:
1. Nerve agent chemical or Organophosphate exposure >30 kg unless pediatric autoinjectors available

PRECAUTIONS:
1. Auto-injectors may penetrate clothing. Attempt to minimize the amount of clothing between injector and skin, while ensuring rapid provision of injection.
2. Once injector is pulled from cap, it is activated. Do not place thumb over end.

SPECIAL NOTES:
1. Supplied in two-pre-loaded, auto-injector syringes containing Atropine, Pralidoxime
2. May not be routinely stocked on all EMS vehicles

*Toxic Exposure/Overdose*
1. Autoinjector dosing chart is present in guideline and may include providing multiple doses, every 5 min until lung sounds clear to auscultation and improvement in HR/BP

# 3.35 METHYLPREDNISOLONE SODIUM SUCCINATE (SOLU-MEDROL)

INDICATION:
1. Treatment of severe exacerbation of asthma, COPD
2. Treatment of acute severe allergic reactions and anaphylaxis
3. Known Adrenal Insufficiency or long-term steroid dependence, with fluid-refractory shock requiring vasopressors

CONTRAINDICATIONS:
1. Hypersensitivity
2. Known Systemic Fungal Infections

PRECAUTIONS:
1. Hyperglycemia

SPECIAL NOTES:
1. Supplied as Act-O-Vial (125 mg / 2 mL) that separates the white powder from the solute until ready to use

*Allergy & Anaphylaxis*
*Asthma/COPD*
1. Consider **Methylprednisolone (Solu-Medrol**) 125 mg IV/IO/IM. Pediatric dose: Methylprednisolone 2 mg/kg IV/IO/IM to maximum dose of 125 mg

*Hypovolemia and Shock*
1. If the patient has a history of adrenal insufficiency or long-term steroid dependence, presenting with fluid-refractory shock requiring vasopressors, consider **Methylprednisolone (Solu-Medrol)** 125 mg IV/IO. Pediatric dose: Methylprednisolone 2 mg/kg IV/IO

# 3.36 METOPROLOL TARTRATE (LOPRESSOR)

INDICATION:
1. Treatment of acute myocardial infarction, treatment of angina and hypertension
2. Treatment of dysrhythmia in consultation with medical direction
3. As an alternative medication to labetalol

CONTRAINDICATIONS:
1. AV block - second or third degree
2. Adult HR <60
3. Cardiogenic shock
4. Acute COPD or Asthma
5. Pediatrics

PRECAUTIONS:
1. Use cautiously in elderly, hepatic or renal disease (increased risk of toxicity)
2. Bronchospastic disease (may aggravate)
3. Insulin dependent diabetes (may mask hypoglycemia)
4. May potentiate AV conduction delay in patients on Digitalis

SPECIAL NOTES:
1. Supplied in 5 mL / 5 mg ampule
2. Contact Medical Direction if in doubt about administering second and third doses or if patient has CHF, asthma, or COPD
3. Life threatening Side Effects: Severe bradycardia, hypotension, AV block, cardiac arrest, cardiac failure, respiratory distress and bronchospasm
4. Other side effects: Mild CNS depression, nausea/vomiting, and wheezing/dyspnea
5. Optional/Alternative medication

*Eclampsia Pre-Eclampsia*
1. For ongoing Hypertension of SBP >160 and DBP >110 mmHg following Magnesium Infusion in **Pre-eclampsia or Hypertension in a Pregnant Patient >20 weeks**
2. **Metoprolol** (if labetalol unavailable) 5mg IVP. Repeat every 5 min to maximum dose of 15 mg
3. Do not administer initial or repeat doses if SBP <140 mmHg, DBP <80 mmHg, or HR <60 BPM

*Hypertensive Emergency*
1. If Labetalol not available, Consider **Metoprolol** 5 mg IVP. Repeat every 5 min to maximum dose of 15 mg
2. Do not administer initial or repeat doses if SBP <140 mmHg, DBP<80 mmHg, or HR <60 BPM

*Chest Pain of Suspected Cardiac Origin*
1. Consider Metoprolol 5mg IVP for patients who have BP above 140/90 and/or heart rate above 120. This dose may be repeated every 5 minutes up to three total doses

# 3.37 MIDAZOLAM HYDROCHLORIDE (VERSED)

INDICATION:
1. Seizures
2. Agitation ≥ IMCRASS 1
3. Need for Sedation
4. Anxiolysis
5. To facilitate intubation as part of RSA if other induction agent unavailable or contraindicated
6. Uncontrolled Shivering in Hypothermia
7. Emergence Reactions post Ketamine use

CONTRAINDICATION:
1. Allergy or known hypersensitivity
2. Hypotension
3. Pregnancy (unless actively seizing)
4. Respiratory depression in the patient without a secure airway

PRECAUTIONS:
1. May cause CNS, respiratory and cardiovascular depression (hypotension)
2. Concurrent use of CNS, Cardio/Respiratory depressants can lead to over sedation or respiratory arrest

SPECIAL NOTES:
1. Usually supplied in vial (5 mg / 5 mL). Be aware of other concentrations
2. This medication is a controlled substance and its use must be documented according to each service Controlled Substance Policy
3. Reduce dose by 50% for elderly or small framed patients
4. Can be administered via the intranasal route using a mucosal atomization device (MAD)
5. Midazolam is the preferred agent when the patient is suffering from agitation associated with cocaine/stimulant use or alcohol withdrawal

*Agitated & Combative*

1. Very agitated patient, routine care not possible, IMCRASS Score = +3:
   Versed up to 5 mg IM per dose (PEDs 0.05 mg/kg max 5 mg).
   - If IV/IO in place/inadequate response to initial dose. Repeat ½ dose IM/IV at 10 minutes x1
   - Versed is preferred when the patient is suffering from agitation associated with cocaine/stimulant use or alcohol withdrawal
2. Agitated or severely anxious patient, IMCRASS Score = +2:
   - Versed up to 2.5 mg (PEDs 0.05 mg/kg max 2.5 mg per dose) IV/IO/IN/IM per dose, every 5 minutes as needed, max of 5 mg total

*Sedation Post ROSC with a Secure Airway*

1. For sedation post ROSC consider low dose Midazolam (Versed) up to 2mg IV/IO per dose if SBP >90mmhg

*Bradycardia*/*Tachycardia*

1. For sedation during transcutaneous pacing or synchronized cardioversion, consider low dose Midazolam (Versed) 2 mg (PEDs 0.05 mg/kg max 2 mg per dose) IV/IO/IN/IM if SBP >90 mmHg

*Seizure/Status Epilepticus*

1. **Midazolam (Versed)** up to 0.1 mg/kg IV/IO. Maximum total 5 mg bolus. If other access is not available, administer Midazolam up to 0.2 mg/kg IM/IN. Maximum 10 mg bolus. If seizures persist, repeat dose of **Midazolam (Versed)** as above every 10 min until seizures stop. Maximum total dose of Midazolam (Versed) is 20 mg unless additional orders obtained in consultation with online medical direction

*Heat Emergencies* - Shivering which prevents cooling

1. Versed up to 2 mg (ped 0.05 mg/kg max 2mg per dose) IV/IO/IN/IM may repeat x 1 in 5 minutes

# 3.38 NALOXONE HYDROCHLORIDE (NARCAN)

INDICATION:
1. Respiratory depression in a confirmed or suspected opioid overdose

CONTRAINDICATION:
1. Allergy or known hypersensitivity

PRECAUTIONS:
1. Naloxone administration, may precipitate withdrawal symptoms (nausea, vomiting, tachycardia), miscarriage, pulmonary edema, or premature labor, or seizures in neonates
2. Short half-life

SPECIAL NOTES:
1. Therapeutic interventions to support the patient's airway, breathing, and circulation should be initiated prior to the administration of naloxone
2. If no response after 4-8 mg of Naloxone, it is unlikely to be effective, proceed to advanced airway if indicated
3. In cardiac arrest, focus first on high quality compressions and ventilation
4. Treatment goal is reversal of opiate effect enough to allow patient adequate independent oxygenation and ventilation, not necessarily to awaken patient fully
5. 4mg and other commercially available naloxone intranasal spray **autoinjectors** may be used by trained EMS providers at EMR and above

*Altered Level of Consciousness*
*Toxic Exposure/Overdose*
1. If a narcotic overdose is suspected, consider **Naloxone (Narcan)** 0.5mg up to 2mg IV/IN/IO/IM per dose to increase respirations
2. Pediatric dose: **Naloxone** 0.1mg/kg IV/IN/IO/IM to maximum of 2 mg per dose

# 3.39 NITROGLYCERIN

INDICATIONS:
1. Adult chest pain of suspected cardiac origin
2. Adult pulmonary edema
3. Adult Confirmed or suspected acute coronary syndrome
4. Adult Hypertensive Emergency

CONTRAINDICATIONS:
1. Allergy or known hypersensitivity
2. Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours

PRECAUTIONS:
1. Headache and hypotension may occur after nitroglycerin (NTG) administration
2. Do not administer if blood pressure is <110 systolic without IV in place
3. Do not give to pediatric patients without a physician order
4. Extreme bradycardia (less than 50 BPM), Tachycardia in the absence of heart failure (greater than 120 BPM)

ADMINISTRATION:
1. For Adults may be administered via paste, spray or tablet route
2. See specific guideline for dosing

SPECIAL NOTES:
1. Consider giving opioid as early adjunct for pain control
2. NTG may relieve angina pectoris. Other conditions such as esophageal spasm can also respond as well
3. Sublingual Nitroglycerin tablet(s) must be fully dissolved before resuming CPAP

*Chest Pain of Suspected Cardiac Origin*
1. Consider **Nitroglycerin** 0.4 mg SL, repeat every 5 minutes as long as Systolic BP > 110 mmHg is maintained, max of three doses
2. Consider **Nitroglycerin** paste. Apply 1" to left chest for adults. Remove if Systolic BP < 110 mmHg

*Congestive Heart Failure/Pulmonary Edema*
1. Consider **Nitroglycerin** 0.4 mg SL, repeat every 5 minutes as long as SBP > 110 mmHg is maintained, no maximum dose
2. If SBP > 160 mmHg, may administer **Nitroglycerin** 0.8 mg (2 sublingual sprays or tablets per dose) every 3-5 minutes. If SBP < 160 mmHg after initial 0.8 mg dose, use **Nitroglycerin** 0.4 mg for subsequent dose(s)

*Hypertensive Emergency*
1. Treatment of symptomatic patient with >220 mmHg systolic or >120 mmHg diastolic, consider application of **Nitroglycerin** paste, 1" to left chest. Goal is reduction of BP by no more than 20% in first hour or symptomatic improvement

# 3.40 NOREPINEPHRINE (LEVOPHED)

INDICATIONS:
1. Blood pressure control in acute hypotensive states
2. Vasodilatory Shock
3. Cardiogenic Shock

CONTRAINDICATION:
1. Hypersensitivity

ADVERSE EFFECTS:
1. Hypertension
2. Tachydysrhythmias
3. Ischemia
4. Anxiety

PRECAUTIONS:
1. During administration closely monitored for signs of infiltration/extravasation. If signs infiltration/extravasation noted, discontinue infusion and notify receiving facility
2. Treatment for hypotension due to acute hemorrhage or hypovolemia should include volume replacement
3. Pregnancy
4. Pediatrics

SPECIAL NOTES:
1. Norepinephrine is the preferred vasopressor, if available, for Cardiogenic, Neurogenic and Septic Shock
2. Extravasation/Infiltration may cause injury, continually assess for administration site for patency and administer through largest vein/IO
3. Requires IV pump for administration unless prior EMS MD approval has been obtained.
4. May be supplied in premixed bag 8 mg / 250 mL or may be supplied at 4 mg / 4 mL vials and require mixing
    a. Additional concentrations may be supplied for interfacility transport
5. Administration requires frequent blood pressure monitoring and continuous cardiac monitoring
6. May precipitate in IV tubing with sodium bicarbonate if tubing is not flushed between drugs.
7. Possible limited effect in patients taking beta blocking or calcium channel blocking drugs
8. If blood pressure does not seem to respond to administration, consider presence of and treatment for obstructive shock

*Shock*, *Sepsis*, *Cardiac Arrest*/*Post ROSC*, *Neurogenic Shock*
1. To achieve SBP of 90 mmHg or MAP 65 in setting of shock not amenable or not responsive to fluid administration consider **Norepinephrine (Levophed)** Adult: 2-20 mcg/min IV/IO,
2. Peds: Correction of hypotension for age per *Routine Medical Care Guideline*
    b. Consider **Norepinephrine (Levophed)** 0.05-0.1 mcg/kg/min IV, titrated to effect up to max of 2 mcg/kg/min

# 3.41 ONDANSETRON HYDROCHLORIDE (ZOFRAN)

INDICATION:
1. Treatment and or Prevention of Nausea and or vomiting

CONTRAINDICATION:
1. Hypersensitivity

PRECAUTIONS:
1. May cause headache and dizziness
2. May cause sedation/drowsiness
3. May prolong QT

ADMINISTRATION:
1. Supplied in vial containing 4 mg / 2 mL or 4 mg Oral Disintegrating Tablet, PO may be substituted if ODT unavailable
2. Administer IV slowly over 2 minutes into running IV

SPECIAL NOTES:
1. If rare extrapyramidal effects are observed, Benadryl can be given (IV Preferred)
2. Use in pregnant/nursing mothers when nausea/vomiting is associated with signs of dehydration

*Nausea, Vertigo, Vomiting*

Ondansetron (Zofran) 4 mg IV/IM or ODT. May repeat x1 in 15 min. Pediatric dose: 15 kg-26 kg: 2 mg, >27 kg: 4 mg

# 3.42 OXYTOCIN (PITOCIN)

INDICATION:
1. Stimulates post-partum contraction of the uterus to control bleeding

CONTRAINDICATIONS:
1. Hypersensitivity
2. Uterine Rupture

PRECAUTIONS:
1. Hypertension
2. Rapid administration may lead to hypotension and dysrhythmia

ADMINISTRATION:
1. May transport per interfacility initiated drip in the post-partum patient
2. 10-40 units added to 500-1000 mL IV fluid to control post-partum-hemorrhage
    a. Usual rate is 10-20 milliunits/minute
    b. Alternate is 10 U IM x 1

SPECIAL NOTES:
1. Optional Medication which requires medical director approval to carry
2. Monitor heart rhythm
3. Check BP frequently; vital sign monitoring required
4. Contact medical direction for any adverse effects
5. Continue sending facility rate on infusion pump

# 3.43 ROCURONIUM BROMIDE (ZEMURON)

INDICATION:
1. Paralysis for facilitation of RSA
2. Provision of long-acting paralysis for effective ventilation of the patient with an advanced airway

CONTRAINDICATIONS:
1. Hypersensitivity

PRECAUTIONS:
1. Cardiac, respiratory, neuromuscular, or liver disease
2. Pregnancy
3. Dehydration
4. Neuromuscular Disease, Patients with Myasthenia Gravis experience prolonged paralysis

SPECIAL NOTES:
1. Administer supplemental oxygen prior to and during paralysis
2. Only administer when all equipment and personnel are ready for invasive airway procedures and preoxygenation has been performed
3. Monitor heart rhythm, pulse oximetry, BP and $EtCO_2$
4. Duration of action >30 minutes, administer ongoing analgesia/sedation after intubation.
5. Prolonged onset may be seen in shock states
6. Contact medical direction for any adverse effects or concerns
7. $EtCO_2$ monitoring mandatory

*RAPID SEQUENCE AIRWAY PROCEDURE*
1. **Rocuronium Bromide** (Zemuron) 1 mg/kg IV/IO (max dose 100 mg). No repeat dosing without medical direction order

# 3.44 SODIUM BICARBONATE

INDICATION:
1. Known or suspected metabolic acidosis
2. Known or Suspected Hyperkalemia
3. Tricyclic overdoses
4. Cocaine overdose with wide QRS
5. Aspirin overdose
6. Urinary Alkalization
7. Crush Syndrome

PRECAUTIONS:
1. May cause hypernatremia and hyperosmolality
2. May precipitate with multiple medications if tubing is not flushed between drugs

CONTRAINDICATIONS:
1. Not effective in hypercarbic acidosis (e.g., cardiac arrest and CPR without secure airway)
2. Severe pulmonary edema

ADMINISTRATION:
1. Supplied in pre-loaded syringe or vial containing 50 mEq / 50 mL

SPECIAL NOTE:
1. For patients < 2 years old administration should include dilution to 4.2%

*Cardiac Arrest*
1. For hyperkalemia or other indication above, give **Sodium Bicarbonate** 50 mEq IV/IO. May repeat as indicated. PEDs dose **Sodium Bicarbonate** 1 mEq/Kg (max dose 50 mEq)

*Toxic Exposure/Overdose*
1. Cocaine overdose with wide QRS, administer **Sodium Bicarbonate** 1 mEq/kg IV/IO (max dose 50 mEq). May repeat once in discussion with online medical diretion
2. Tricyclic antidepressant overdose with wide QRS, consider **Sodium Bicarbonate** 8.4% 1 mEq/kg Iv/IO (max dose 50 mEq). May repeat once in discussion with online medical direction
   a. For prolonged transport of adult TCA overdose patients and after initial bolus administered, consider a **Sodium Bicarbonate** infusion in discussion with online medical direction
      -Add 3 pre-loaded syringes to 1 L of NS and infuse at 250 mL/hr

*Routine Trauma Guideline - Crush Syndrome*
1. For crush over 1-hour duration, consider dilute **Sodium Bicarbonate** infusion. Add 50 mEq **Sodium Bicarbonate** (1 pre-loaded syringe) to 1 L of NS for administration
   a. Adult dose:
      - Initiate 500 mL/hr infusion
      - Attempt to administer 1 L bolus of dilute sodium bicarbonate fluid just prior to extrication/release of crush
   b. Pediatric dose:
      - 10 kg: 4 mL/kg/hr infusion
      - 10-20 kg: 40 mL/hr plus 2 mL/kg/hr for each kg between 10-20 kg
      - >20 kg: 60 mL/hr plus 1 mL/kg/hr for each kg above 20 kg
      - Attempt to administer 20 mL/kg bolus of dilute sodium bicarbonate fluid (max dose 1000 mL) just prior to extrication/release of crush
   c. If suspicion for hyperkalemia as evident by peaked T-waves, Prolonged QRS (greater than 0.12 seconds), absent P wave, prolonged QTc, ventricular irritability or sine wave, or when cardiac monitoring not feasible
      - Administer 1 mEq/kg **Sodium Bicarbonate** (max 50 mEq bolus) **SLOW** IV/IO

# 3.45 SUCCINYLCHOLINE CHLORIDE (ANECTINE)

INDICATION:
1. Paralysis for facilitation of RSA - Single Dosing

CONTRAINDICATIONS:
1. Hypersensitivity
2. Malignant hyperthermia
3. Penetrating eye injury
4. Pediatric patients <2 y/o

PRECAUTIONS:
1. Pregnancy
2. Burns greater than 24 hrs
3. Glaucoma, eye surgery
4. Elderly or debilitated patients
5. Known or suspected hyperkalemia
6. Neuromuscular Disorders
7. Known Pseudocholinesterase deficiencies
8. Renal Failure
9. Organophosphate toxicity

SPECIAL NOTES:
1. Succinylcholine requires refrigeration for effectiveness until marked expiration date. If stored unrefrigerated, effectiveness expires in 90 days
2. Muscle fasciculation may occur
3. Administer supplemental oxygen prior to and during paralysis
4. Only administer when all equipment and personnel are ready for invasive airway methods and preoxygenation has been performed
5. Monitor heart rhythm, pulse oximetry, BP and $EtCO_2$ (mandatory)
6. If cardiac arrest occurs and no other cause identified, treat for hyperkalemia
7. Contact medical direction for any adverse effects or concerns
8. Administer ongoing analgesia/sedation after intubation

*RAPID SEQUENCE AIRWAY PROCEDURE*
1. **Succinylcholine Chloride (Anectine)** 2 mg/kg IV/IO/IM (max dose 200 mg). No repeat dosing.
   a. IM Succinylcholine has unreliable absorption and is only to be used in the event of IV/IO failure
   b. Do not repeat dose for long term paralysis after intubation

# 3.46 TERBUTALINE (BRETHINE)

INDICATIONS:
1. Reversal of bronchospasm
2. Tocolysis in consultation with Medical Direction

CONTRAINDICATIONS:
1. Known allergy or hypersensitivity
2. Less than 6 years of age

PRECAUTIONS:
1. Cardiovascular Disorders
2. Hyperthyroidism
3. Diabetes
4. Seizure Disorders
5. Kidney Disease
6. Use of MAO inhibitor or tricyclic antidepressant (TCA) within 14 days

SPECIAL NOTES:
1. Adverse Reactions: Nervousness/Tremors, Palpitations, Arrhythmias, Tachycardia, Flushing/Diaphoresis, Chest Discomfort, Drowsiness, Dizziness/Headache, Nausea/Vomiting

*Asthma/COPD*
1. Adult dose (12 years and older): 0.25 mg SC
2. Pediatric dose (6-11 years old): 0.01 mg/kg (max 0.25 mg) SC
3. May repeat in 15 to 30 minutes x1, if needed
4. Max total combined dose is 0.5 mg

# 3.47 TETRACAINE

INDICATION:
1. Temporary relief of pain due to corneal abrasion, foreign body, or burns to eye(s)

CONTRAINDICATIONS:
1. Open globe injury
2. Hypersensitivity including Lidocaine hypersensitivity

PRECAUTIONS:
1. Once drops are placed, be sure patient does not rub eyes
2. Not for prolonged use

*Routine Trauma Guideline*
1. For treatment of pain due to eye injury, consider **Tetracaine** 2 drops/eye. May repeat every 5-10 minutes, max 3 doses

# 3.48 TORADOL (KETOROLAC)

INDICATIONS:
1. Temporary relief of pain, especially pain related to isolated orthopedic injuries, kidney and gall stones
2. Treatment of fever if unable to tolerate PO

CONTRAINDICATIONS:
1. Known allergy or hypersensitivity to Non-Steroidal Anti-Inflammatory medications (NSAIDS) – including Motrin or Advil (Ibuprofen), Aleve (Naproxen)
2. Active hemorrhage
3. Concern for intracranial hemorrhage or stroke
4. Patients <1-year-old
5. Pregnancy or breastfeeding
6. History of GI bleeding
7. Known or suspected Renal Insufficiency/Disease
8. Current use of blood thinning agent e.g. Coumadin (Warfarin), Xarelto (Rivaroxaban), Eliquis (Apixaban), Aspirin
9. Shock, Dehydration, Hypotension
10. CHF
11. Asthma
12. Should not be given via the Intraosseous route

PRECAUTIONS:
1. Elderly (>65 y/o)
2. Post procedure/post-surgical patients

*Pain Management*
*Fever & Sepsis*
1. Adult: **Ketorolac (Toradol)** 15 mg IV/IM x1
2. Pediatric 1 year old and older: **Ketorolac (Toradol)** 0.5 mg/kg IV/IM x1. Max dose is 15 mg IV/IM

# 3.49 TRANEXAMIC ACID (TXA)

INDICATIONS:
1. Suspected Traumatic Hemorrhage Shock and suspected need for blood transfusion
2. Suspected Traumatic Intracranial Hemorrhage
3. Post-partum hemorrhage with suspected need for blood transfusion

Class: Anti-Fibrinolytic
Actions/Pharmacodynamics:
Decreases clot breakdown in the setting of massive hemorrhage.

CONTRAINDICATIONS:
1. Non-hemorrhagic shock(septic/spinal/cardiogenic)
2. Initiation of Bleeding > 3 hours
3. Hypersensitivity

PRECAUTIONS:
1. Rapid Administration may cause hypotension

ADMINISTRATION:
1. Supplied as 1 g / 10 mL vial or ampule (100 mg/mL), Administer diluted over 20 min in 100 mL or 250 mL NS

Special Notes:
1. Not indicated for Gastrointestinal hemorrhage without Medical Direction order
2. May be indicated for other, nontraumatic hemorrhagic shock, severe epistaxis, post-tonsillectomy hemorrhage - Contact Medical Directions

*Routine Trauma Guideline - Traumatic Hemorrhagic Shock* within 3 hours of injury
1. Over 12 years old: Consider diluted infusion of **TXA** 2 g IV/IO, over 20 minutes.
2. Under 12 years old: Consider diluted infusion of **TXA** 30 mg/kg (max dose 2 g) IV/IO over 20 minutes

*Routine Trauma Guideline - Traumatic Hemorrhagic Shock,* GCS <12 and within 3 hours of injury
1. Over 12 years old: Consider diluted infusion of **TXA** 1 g IV/IO, over 20 minutes
2. Under 12 years old: Consider diluted infusion of **TXA** 30 mg/kg (Max dose 2 g) IV/IO over 20 minutes

*Vaginal Bleeding After Delivery*
1. If post-partum bleeding and concern for hemorrhagic shock with sustained SBP < 90 mmHg or sustained heart rate > 110 beats per minute, administer diluted infusion of **TXA** 1 g IV/IO over 20 minutes. May repeat x 1

# 3.50 VASOPRESSIN (PITRESSIN)

INDICATIONS:
1. Shock
2. As an alternative medication

CONTRAINDICATION:
1. Hypersensitivity

ADMINISTRATION:
1. Per sending facility with IV pump

SPECIAL NOTES:
1. A non-adrenergic vasopressor, increases coronary perfusion pressure, vital organ flow, and cerebral oxygen delivery
2. A potent, peripheral vasoconstrictor for use in cardiac arrest. It causes no increase in myocardial oxygen consumption during CPR

REFERENCE GUIDELINE:

*Interfacility/Critical Care*

# 3.51 VECURONIUM BROMIDE (NORCURON)

INDICATION:
1. Skeletal muscle relaxation after secure airway has been established and confirmed

CONTRAINDICATIONS:
1. Hypersensitivity
2. Unsecured Airway
3. Patient <2 years old

PRECAUTIONS:
1. Cardiac, respiratory, neuromuscular, or liver disease
2. Pregnancy
3. Dehydration

ADMINISTRATION:
1. Supplied in vial in powder form 10mg or 20mg
2. Reconstitute prior to use

SPECIAL NOTES:
1. Administer supplemental oxygen prior to and during paralysis
2. Only administer when all equipment and personnel are ready for invasive airway procedures and preoxygenation has been performed
3. Monitor heart rhythm, pulse oximetry, BP and $EtCO_2$ (mandatory)
4. Administer with ongoing analgesia/sedation
5. Contact medical direction for any adverse effects or concerns.

*Rapid Sequence Airway procedure*
1. For paralysis following confirmed airway placement administer **Vecuronium Bromide (Norcuron)** 0.1 mg/kg IV/IO max of 10 mg x 1

# 3.52 XOPENEX (LEVABUTEROL)

INDICATION:
1. May be used in place of Albuterol in any guidelines

CONTRAINDICATION:
1. Hypersensitivity

PRECAUTIONS:
1. Rarely may produce paradoxical bronchospasm, which can be life threatening, discontinue treatment immediately if this occurs
2. Beta receptor blocking agents and albuterol inhibit the effect of each other
3. Use with caution in patients with cardiovascular disorders, or in patients being treated with antidepressants
4. Arrythmias

SPECIAL NOTES:
1. Only to be used in Albuterol shortage or as authorized by medical direction
2. May be supplied as MDI
3. May be administered nebulized via the inline route
4. Nebulizer treatment should be administered as soon as the need is identified and continued en route rather than delaying transport to complete administration of Albuterol dose
5. Treatments for the patient with active tuberculosis or other airborne pathogens should be performed in well-ventilated areas (outside patient compartment if possible) using appropriate PPE

*Asthma/COPD*
*Allergy and Anaphylaxis*
*Burns*
1. **Levalbuterol (Xopenex)** nebulizer 1.25mg, may repeat X 2
2. Pediatric dosing
   a. 6-11 years of age: **Levalbuterol (Xopenex)** nebulizer 0.63 mg
   b. <6 years of age: **Levalbuterol (Xopenex)** nebulizer 0.31 mg

*Cardiac Arrest with suspected hyperkalemia* as an adjunctive treatment
*Wide Complex Tachycardia with suspected hyperkalemia* as an adjunctive treatment, Crush Syndrome as an adjunctive treatment
1. **Levalbuterol (Xopenex)** 5 mg via nebulizer
2. Pediatric patients less than 1 year of age, **Levalbuterol (Xopenex)** 1.25 mg via nebulizer
3. Pediatric patients older than 1 year of age, **Levalbuterol (Xopenex)** 2.5 mg via nebulizer

# 3.53 Liquid Dosing Chart

| Patient Weight (kg) | Patient Weight (lbs) | Acetaminophen Dose (mg) | Acetaminophen 160 mg / 5 mL Dose (mL) | Ibuprofen Dose (mg) | Ibuprofen 100 mg / 5 mL Dose (mL) | Diphenhydramine Dose (mg) | Diphenhydramine 12.5 mg / 5 mL Dose (mL) |
|---|---|---|---|---|---|---|---|
| **3** | 6.6 | 45 | 1.4 | XXX | Do | XXX | XXX |
| **4** | 8.8 | 60 | 1.9 | XXX | Not | XXX | Do |
| **5** | 11 | 75 | 2.3 | XXX | Use | XXX | Not |
| **6** | 13.2 | 90 | 2.8 | XXX | <6 months/old | XXX | Use |
| **7** | 15.4 | 105 | 3.3 | XXX | XXX | XXX | < 1y/o |
| **8** | 17.6 | 120 | 3.8 | 80 | 4 | 8 | XXX |
| **9** | 19.8 | 135 | 4.2 | 90 | 4.5 | 9 | XXX |
| 10 | 22 | 150 | 4.7 | 100 | 5 | 10 | 4 |
| 11 | 24.2 | 165 | 5.2 | 110 | 5.5 | 11 | 4.4 |
| **12** | 26.4 | 180 | 5.6 | 120 | 6 | 12 | 4.8 |
| **13** | 28.6 | 195 | 6.1 | 130 | 6.5 | 13 | 5.2 |
| **14** | 30.8 | 210 | 6.6 | 140 | 7 | 14 | 5.6 |
| **15** | 33 | 225 | 7.0 | 150 | 7.5 | 15 | 6 |
| **16** | 35.2 | 240 | 7.5 | 160 | 8 | 16 | 6.4 |
| **17** | 37.4 | 255 | 8.0 | 170 | 8.5 | 17 | 6.8 |
| **18** | 39.6 | 270 | 8.4 | 180 | 9 | 18 | 7.2 |
| **19** | 41.8 | 285 | 8.9 | 190 | 9.5 | 19 | 7.6 |
| **20** | 44 | 300 | 9.4 | 200 | 10 | 20 | 8 |
| **22** | 48.4 | 330 | 10.3 | 220 | 11 | 22 | 8.8 |
| **24** | 52.8 | 360 | 11.3 | 240 | 12 | 24 | 9.6 |
| **26** | 57.2 | 390 | 12.2 | 260 | 13 | 26 | 10.4 |
| **28** | 61.6 | 420 | 13.1 | 280 | 14 | 28 | 11.2 |
| **30** | 66 | 450 | 14.1 | 300 | 15 | 30 | 12 |
| **32** | 70.4 | 480 | 15.0 | 320 | 16 | 32 | 12.8 |
| **34** | 74.8 | 510 | 15.9 | 340 | 17 | 34 | 13.6 |
| **36** | 79.2 | 540 | 16.9 | 360 | 18 | 36 | 14.4 |
| **38** | 83.6 | 570 | 17.8 | 380 | 19 | 38 | 15.2 |
| **40** | 88 | 600 | 18.8 | 400 | 20 | 40 | 16 |
| **42** | 92.4 | 630 | 19.7 | 400 | 20 | 42 | 16.8 |
| **44** | 96.8 | 660 | 20.6 | 400 | 20 | 44 | 17.6 |
| **46** | 101.2 | 690 | 21.6 | 400 | 20 | 46 | 18.4 |
| **48** | 105.6 | 750 | 23.4 | 400 | 20 | 48 | 19.2 |
| **50** | 110 | 750 | 23.4 | 400 | 20 | 50 | 20 |
| **Patient Weight (kg)** | **Patient Weight (lbs)** | **Acetaminophen Dose (mg)** | **Acetaminophen 160 mg / 5 mL Dose (mL)** | **Ibuprofen Dose (mg)** | **Ibuprofen 100 mg / 5 mL Dose (mL)** | **Diphenhydramine Dose (mg)** | **Diphenhydramine 12.5 mg / 5 mL Dose (mL)** |

# SECTION 4 PRACTICAL SKILLS

# 4.01 12 LEAD ACQUISITION AND TRANSMISSION

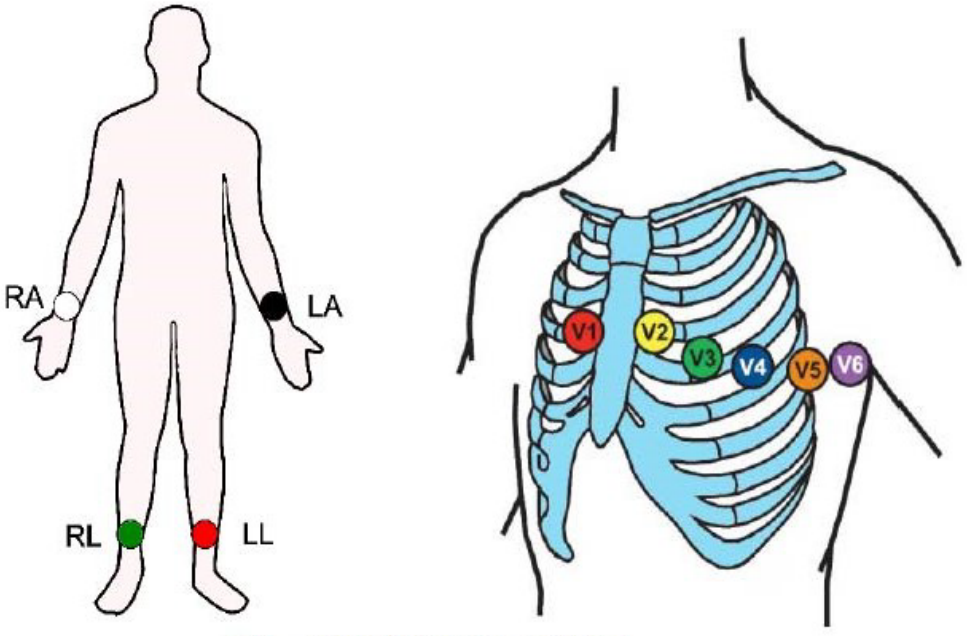
Early (Goal <10 min of first medical contact) prehospital 12-Lead ECGs may decrease the time to percutaneous coronary intervention (PCI) for patients with acute ST segment elevation myocardial infarctions (STEMI). 12-Lead ECGs done by EMTs are a non-diagnostic skill and should be interpreted by Paramedics or transmitted for interpretation. If hospital is closer than advanced level intercept services, transport should proceed to the hospital.

Indications

I. Chest pain, pressure or discomfort suggestive of acute coronary syndrome.
II. Acute onset of dyspnea
III. Syncope, generalized weakness, new onset seizures or altered level of consciousness.
IV. New onset of cardiac dysrhythmia (palpitations, irregular heart rate, heart rate <60 or >120)
V. Any patient who has sustained chest trauma and exhibits signs or symptoms of myocardial injury
VI. Other concerning signs/symptoms in which a 12-lead EKG would be beneficial

Procedure

I. Place the patient in a supine position or semi-fowler if orthopnea. Explain the procedure, its importance and get consent
II. Maintain modesty when possible, clean/dry skin, encourage patient to remain still.
III. Connect precordial leads to 5-lead monitoring cable
IV. Attach electrodes to all ten leads and place limb leads (not on torso) avoid placing electrodes over bony prominences
V. Position precordial chest leads:
    A. **V1** (4th intercostals space) then 1" off center
    B. **V2** same space other side
    C. **V4** (5th intercostals space) left midclavicular line
    D. **V3** directly between V2 & V4
    E. **V5** directly horizontal (level) left anterior axillary line
    F. **V6** directly horizontal (level) left midaxillary line
        1. Do not place V3-V6 on the breast, place underneath. Ask patient to lift left breast or use the back of your hand
VI. Acquire the 12-Lead ECG as directed by the manufacturer of the monitor. Encourage patient to remain still as 12-Lead is being acquired
VII. If BLS and printout states ***ACUTE MI SUSPECTED***, call for ALS, or if ALS interprets ECG as meeting STEMI criteria, transport to closest appropriate hospital and follow *Chest Pain guideline*
VIII. Attach a copy of the 12-Lead strip to the electronic EMS Patient Care Report and/or leave a copy at the receiving facility
IX. If patient condition changes, consider repeating ECG




**RA** – right forearm or wrist
**LA** – left forearm or wrist
**LL** – left lower leg, proximal to ankle
**RL** – right lower leg, proximal to ankle
**V1** – 4-th intercostal space, right sternal edge
**V2** – 4-th intercostal space, left sternal edge
**V3** – midway between V2 and V4
**V4** – 5-th intercostal space, mid-clavicular line
**V5** – anterior axillary line in straight line with V4
**V6** – mid-axillary line in straight line with V4 and V5

# 4.02 Adult and Pediatric Cardioversion

Procedure:

I. Ensure criteria are met for cardioversion per “unstable” criteria
II. If indicated perform sedation per appropriate guidelines
III. Apply limb leads
IV. Place conductive hands-free multi-function pads on the patient in appropriate location
    A. Anterior / Posterior: Place negative electrode on left anterior chest, halfway between the xiphoid process and the left nipple. This corresponds with the V2 – V3 EKG position. Place the positive electrode on left posterior chest beneath the scapula and lateral to the spine
    B. Anterior / Anterior: Place the negative electrode on the left chest, mid-axilla over the fourth intercostal space. Place positive electrode on anterior right chest, sub-clavicular area. Avoid placing the pads over any implantable electrical device or transcutaneous medication patches
V. Apply limb leads
VI. Select appropriate energy level for clinical situation
    A. Adult perform first synchronized cardioversion @ 150 Joules
        1. If unsuccessful, increase by 50 joules for each subsequent attempt
    B. Pediatric perform first synchronized cardioversion @ 1 j/kg
        1. If unsuccessful, increase synchronized cardioversion to 2 j/kg first attempt
VII. Press synchronizer switch/button
VIII. Assure machine is sensing R-wave
IX. Charge defibrillator
X. CLEAR patient. Ensure supplement oxygen is removed and has dissipated
XI. Press discharge button and hold button until delivery of shock occurs. Obtain rhythm strip
XII. Reassess patient and proceed as indicated by patient condition
XIII. If repeat shock is indicated increase to next energy level and ensure sync mode is activated as above

# 4.03 BLOOD DRAW

Medical blood draws by EMS can be beneficial to the patient. When an IV or saline lock is to be established, blood may be drawn for hospital use in those hospitals accepting prehospital blood draws. This may reduce the amount of needle sticks and increases the speed in which laboratory results are available to guide patient treatment in the hospital.

Bloodborne pathogen precautions must always be utilized. After initial venipuncture, either attach a non-flushed extension loop for blood draw or draw directly off the catheter with appropriate equipment or syringe. Commercial devices should be utilized, and at no time should needles be utilized to fill blood tubes. Limit tourniquet time.

Draw appropriate blood quantity to fill required blood tubes based on destination hospital requirements. Blood draws should be labeled and delivered directly to receiving nurse in ED. Name, DOB, date, and time should be documented to ensure the sample is properly identified.

Blood draws for legal purposes are not indicated by this EMS guideline.

# 4.04 CARDIAC ULTRASOUND PROCEDURE

Optional guideline for Mercyhealth US credentialed paramedics only

**Indication**:

I. Pulseless Electrical Activity (PEA) during Cardiac arrest
II. Termination of resuscitation

**Contraindications**:

Examiner is not trained to perform ultrasound or interpret ultrasound findings

**Procedure:**

I. For cardiac arrest patients with PEA as initial rhythm, or if PEA is persistent/ develops during cardiac arrest care:
   A. Obtain and record one cardiac ultrasound view (parasternal long axis, subxiphoid, OR apical 4 chamber views are acceptable) during a rhythm/pulse check pause of chest compressions to determine presence or absence of cardiac activity.
      1. Time to obtain and record the ultrasound image should not exceed 5 seconds.
      2. Do not let obtaining ultrasound images delay or cause interruptions in compressions.
      3. Use the recorded video to determine presence or absence of cardiac activity while resuming chest compressions if unable to immediately determine cardiac activity.
   B. If organized cardiac activity is ABSENT: immediately resume chest compressions and continue usual cardiac arrest care.
   C. If organized cardiac activity is PRESENT: obtain and record an ultrasound doppler view of one carotid artery for evaluation of forward blood flow.
      1. If carotid flow is ABSENT: immediately resume chest compressions and continue usual cardiac arrest care.
      2. If carotid flow is PRESENT: hold chest compressions, initiate heart rate and BP support for severe shock, including IV fluid and pressor administration. Continue frequent patient assessment and monitoring. Resume chest compressions if indicated.

II. If a pericardial effusion with tamponade is visualized during cardiac ultrasound, proceed to pericardiocentesis.
III. For cardiac arrest patients with any other cardiac rhythm (not PEA):
   A. Continue cardiac arrest care according to guideline. Do NOT obtain ultrasound imaging due to risk of delay in providing chest compressions or appropriate defibrillation.
IV. Prior to termination of resuscitation, obtain and record one cardiac ultrasound view to verify the absence of cardiac activity. Ultrasound should be used with other clinical information (e.g. time since cardiac arrest, end tidal CO2, other medical history) to determine whether termination of resuscitation is appropriate. Consult online medical direction as needed.
V. Video recording of images shall be catalogued and saved to PCR in all circumstances.
VI. After use of the ultrasound and completion of patient care, clean all parts of ultrasound device and probe according to ultrasound manufacturer instructions, allow to air dry prior to storage.

# 4.05 CENTRAL VENOUS CATHETER (CVC)

Paramedics should consider other routes of medication administration such as intramuscular (IM), intraosseous (IO), or intranasal (IN) before using pre-existing vascular access devices.

Paramedics may utilize these devices when intravenous or intraosseous access at other sites is not practical or feasible for all age patients who are critically ill or in consultation with Medical Direction.

EMS providers may occasionally encounter a patient with a pre-existing central venous catheter. Numerous devices exist, but all utilize a catheter which terminates in a large central vein, often the vena cava. Some devices are temporary, while others may be long-term or permanent. They are often placed for patients who need multiple or frequent injections, or for patients who require medications which may be more corrosive on the peripheral vasculature, such as some chemotherapy agents. Additionally, dialysis catheters, a specific type of central venous catheter, are utilized for hemodialysis.

Most central venous catheters utilize Luer-lock medication ports. To utilize one of these devices, it is crucial to first thoroughly clean the port with an alcohol prep, chlorhexidine, or other similar antiseptic. Failure to complete this step may cause bacteremia, sepsis, and the need to remove the CVC. Some devices may utilize clamps along the tubing/device. Ensure that these are open, if present. Once the port is clean and all clamps are open, flush with 5 mL of normal saline to ensure patency. Aseptically administer the medication per standard methods of IV administration, and then flush again with 20 mL of normal saline. Close any clamps. For IV fluids, simply attach the IV tubing and administer in the same manner as through a peripheral IV, after thoroughly cleaning the port. Each device has different specific details relevant to access and use, as listed below:

<u>Peripherally Inserted Central Catheter (PICC Line):</u>
PICC lines resemble peripheral IVs externally, but are much longer, running from the insertion site in the arm (typically) into the central vasculature, usually the superior vena cava. These are often temporary devices, but may remain in place for years. Most have one port externally, but some have two or three ports. They will also have a larger dressing than is typical of a peripheral IV, due to increased risk of infection.

A PICC line may be accessed by Paramedics when the need for time-sensitive intravenous medication or fluids is present when peripheral IV access is anticipated to be difficult to obtain.

<u>Dialysis Catheters:</u>
Dialysis catheters are typically present on the patient's neck or chest, and may be tunneled or non-tunneled. Tunneled devices traverse under the soft tissue before entering the central vasculature, which reduces risk of infection, and allows them to be in place for much longer. These devices typically have two ports, though some have three, with colors indicating their use. The red port indicates the port utilized to remove blood from the patient, while the white or blue port is utilized to return blood to the patient.

Dialysis catheters should only be utilized by Paramedics during cardiac arrest when IV and IO access are not possible. Otherwise, the device should not be used. Any administration should be aseptically through the blue or white port.

<u>Implantable Ports:</u>
Implantable Ports are surgically placed devices, identified by a small palpable mass just below the skin on the chest wall. This mass is a small medication reservoir, which is connected to a catheter that travels to the central vasculature. These devices are often called "Port-a-Cath" or "Mediport," and are typically utilized in

patients receiving intermittent long-term intravenous treatments, including chemotherapy. The reservoir must be accessed by a specialized needle called a Huber needle.

If a patient has an Implantable Port which has already been accessed, typically in an outpatient medical office or transfusion center, then the Paramedic may aseptically utilize the port for medication or fluid administration. Paramedics should never attempt to access an Implantable Port.

Other Central Venous Catheters:
Numerous other central venous catheters exist, though most will not be present outside of the hospital. If an EMS provider encounters a patient with a CVC not previously discussed, attempt standard vascular access, and contact medical direction to determine whether use of the central line would be appropriate.

Complications of Central Venous Catheters:
Several clinically relevant complications may arise in patients with CVCs, and close monitoring for these complications is important.

I. Infection: Central Venous Catheters increase patient risk of infection. Monitor the site for redness, warmth, or discharge, and monitor the patient for fever or any other signs or symptoms of sepsis, and do not access if any signs of infection are present
II. Thrombus: clots may form in the deep veins around the tip of the catheter. Monitor the patient for swelling, pain, and redness of the limb with the central line
III. Air embolus: as with any vascular access device, air should not be injected into a CVC. Additionally, if clamps are present, keep them closed with the device is not being utilized, and if any caps are present, keep them in place when the device is not being utilized
IV. Line damage: CVCs may become damaged from a variety of causes, including breakage of the line, or the line inadvertently being cut. Avoid use of scissors in close proximity to any CVC. If a break or cut is identified externally, attempt to clamp the line proximal to the cut or break

Contact medical direction whenever any question arises regarding the use of a Central Venous Catheter, or when a complication is suspected.

# 4.06 CHEST DECOMPRESSION

Signs and symptoms of a patient suffering a tension pneumothorax may include restlessness and agitation; severe respiratory distress; increased airway resistance on ventilating patient; JVD, tracheal deviation; subcutaneous emphysema; unequal breath sounds and/or absent on the affected side; hyper-resonance to percussion on the affected side; hypotension; cyanosis; and traumatic cardiac and/or respiratory arrest.

**Purpose:**
Convert tension pneumothorax to an open pneumothorax.

**Equipment:**
ARS (Air Release System 3.5 inch) needle, other medical director approved devices or 10 or 14 gauge 3.5" angiocath.
Pediatrics use 18 gauge 1.88" angiocath.

**Patient Position:**
Supine

**Landmarks:**
Either the 5th intercostal space (ICS) in the anterior axillary line (AAL) or the 2nd ICS in the mid-clavicular line (MCL) may be used for needle decompression (NDC.) If the anterior (MCL) site is used, do not insert the needle medial to the nipple line. For Adults the lateral site is preferred. For Pediatrics the anterior site is preferred.

**Technique:**
Direct needle over top of the rib and insert at a 90-degree angle listening for air rush. Insert to hub, hold in place for 10 seconds prior to removing stylet. Remove stylet, but leave catheter in place after relief.

**Other:**
If the initial chest decompression fails to improve the signs/symptoms from the suspected tension pneumothorax: − Perform an additional chest decompression on the same side of the chest at whichever of the two recommended sites was not previously used. Use a new needle/catheter unit for the additional attempt(s).

# 4.07 CONDUCTED ELECTRICAL WEAPON (TASER)

If called upon to treat a person who has been subjected to the TASER, it is important to make sure that the patient has either been appropriately restrained by the police, or that there are sufficient police personnel available to assist with the patient prior to any intervention attempted. Typically, it is not the "TASER" event itself that leads to the need for transport to the hospital, rather the events that have led up to the individual being tased. Refer to *Agitated and Combative Guidelines* if indicated. Police personnel may have already removed the probes and you are only needed for patient evaluation for possible secondary injuries.

I. Gloves must be worn.

II. Confirm device has been turned off and that the barb cartridge has been disconnected from the electrical weapon.

III. Patients with conducted electrical weapon (Taser®) barb penetration in vulnerable areas of body as below should be transported to the hospital for further evaluation and probe removal.
   - A. Barbs embedded in skin above level of the clavicles, genitalia, hands/feet or female breasts.
   - B. Suspicion that probe might be embedded in bone, tendon, ligament, nerve, blood vessel or other sensitive structure.

IV. Following obtaining consent, barbs may be removed if not in an area listed above, by stabilizing the skin surrounding the barb and grasping the barb shaft and pulling straight out with a gentle but quick motion.

V. Once extracted, visually inspect barb to make sure it is intact and that nothing remains in patient. If concern exists, transport to hospital.
   - A. If the probes are not going to be collected and maintained for evidence by the LEO, dispose of the probe in a sharps container, being careful not to injure oneself with the probe
   - B. Document the removal location and time of removal in the patient care report

VI. Cleanse area, apply bandage to the area where the barb was removed.
   - A. Ensure hemostasis, for excessive bleeding, apply pressure and transport.
   - B. Inform the patient that they will need tetanus prophylaxis if they have not received one in the last five years or if primary series is not complete.
   - C. Advise patient to seek care for signs of infection including increased pain at the site, redness swelling or fever.

VII. Cardiac Monitoring/Transport is indicated if the patient has signs and or symptoms that could be cardiac in nature including but not limited to: irregular pulse, palpitations, abnormal vital signs, altered mental status, history of AICD/Pacemaker, or if the patients experienced a loss of consciousness and/or seizure following electrical discharge.

VIII. Be aware that secondary injuries are possible due to the subject falling from a standing position. A thorough physical examination should be performed in these cases.

IX. If the probes have been removed prehospital and the patient is being transported to the ED for further examination, make sure that the staff is notified and that the location of the puncture sites are communicated to the staff upon arrival.

X. If after removal of all TASER probes, the patients should generally be transported to the hospital by EMS. The patient may refuse medical treatment and/or transportation if they meet criteria established in the Refusal of Medical Care Guidelines and the Patient has no other acute medical or psychiatric condition requiring medical evaluation, such as: Traumatic injury sustained in taser induced fall or police encounter, hypoglycemia, acute psychiatric disturbance, or delirium.
   - A. Recommend that the patient be evaluated in an emergency department.
   - B. Complete refusal form as applicable per *Consent/Refusal of Medical Care*

# 4.08 CPAP

Indications: – Patients in respiratory distress for reasons other than suspected pneumothorax and:

- Is awake and alert
- Is over 12 years old and able to fit the CPAP mask
- Has the ability to maintain a patent airway
- Has a systolic blood pressure above 90 mmHg
  - Note: CPAP may decrease preload, which may lower blood pressure
- Using accessory muscles of respiration with $SpO_2$ <94%
- Signs and symptoms are consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia

Contraindications:

- Respiratory arrest
- Systolic BP < 90 mmHg
- Heavy oral secretions or vomiting
- Patient is suspected of having a pneumothorax
- Patient has a tracheostomy

Precautions: – Use care if the patient has:

- Impaired mental status and is not able to cooperate with the procedure
- Failed at past attempts at noninvasive ventilation
- Active upper GI bleeding or history of recent upper gastric surgery
- Complaints of nausea (remove if vomiting begins)
- Inadequate respiratory effort
- Excessive secretions
- Facial deformity that prevents the use of CPAP
- If a sublingual medication such as Nitroglycerin has been administered assure the tablet is fully dissolved prior to applying/resuming CPAP

Alternative: – Advanced airway maneuvers should be considered if:

- Respiratory or cardiac arrest
- Unresponsive to verbal stimuli and loss of gag reflex

Procedure:

- Assess patient for pneumothorax
- Explain procedure to patient
- Ensure adequate oxygen supply to ventilation device (100% when starting therapy and until $SpO_2$ is >94%)
- Place the patient on continuous pulse oximetry and $EtCO_2$
- Place the delivery device over the mouth and nose
- Secure the mask with provided straps or other provided devices per manufacturer recommendations
- Use 5 cm H2O of PEEP to start and titrate to effect up to 15 cm H2O. Monitor BP closely during titration
- Check for air leaks
- Monitor and document the patient's respiratory response to treatment
- Check and document vital signs every 5 minutes
  - If BP drops to < 90 mmHg, discontinue CPAP
- Continue to coach patient to keep mask in place and readjust as needed

- If respiratory status deteriorates, remove device and consider intermittent positive pressure ventilation with or without endotracheal intubation
- May utilize inline neb with CPAP mask per appropriate guideline(s)
- Note: Remove CPAP if patient worsens while on CPAP

Removal Procedure:

- CPAP therapy needs to be continuous and generally should not be removed unless the patient cannot tolerate the mask or experiences continued or worsening respiratory failure
- Intermittent positive pressure ventilation and/or intubation should be considered if the patient is removed from CPAP therapy

# 4.09 EMERGENCY SURGICAL AND NEEDLE CRICOTHYROTOMY

Indication:

I. Need for definitive airway control in patients in whom such control cannot otherwise be established by other methods

Contraindications:

I. The ability to obtain airway control and effective ventilation by less invasive means.
II. Inability to identify proper landmarks

ADULT PROCEDURE (Age approximately >12 y/o):

I. Unless contraindicated by trauma, place a small roll under or slightly extend neck. In patients suspected of having a spinal injury, inline stabilization should be maintained throughout the procedure
II. Locate cricothyroid membrane by tilting patient's head back (if not contraindicated by possible spinal injury) and palpating for the V-Notch of the thyroid cartilage (Adams Apple)
III. Prepare the skin with antiseptic solution and maintain aseptic technique
IV. Stabilize the thyroid cartilage between thumb and middle finger of one hand
V. Press index finger of same hand between the thyroid and cricoid cartilage to identify cricothyroid membrane
VI. Using a scalpel, make a vertical incision through the skin, to locate the cricothyroid membrane
VII. After identifying the cricothyroid membrane, make a horizontal incision using the scalpel blade. An adequate incision eases the introduction of the tube
VIII. Maintain opening in cricothyroid membrane with finger/Bougie/ scalpel/handle of scalpel
IX. Carefully insert the tracheostomy tube supplied in the surgical cricothyrotomy kit or ET tube (generally a size 6.0 for adults). Inflate the cuff
X. Provide ventilation by a bag-valve device with 100% oxygen
XI. Determine adequacy of ventilation through bilateral auscultation, epigastrium auscultation, and observation of rise and fall of the chest and waveform capnography and adjust the tube if necessary. Confirm via methods described in *Routine Medical Care Guideline*
XII. Securely fix the trach tube or ET tube in place, including manually guarding if necessary
XIII. Provide update of patient's status to hospital and transport immediately. All Emergency cricothyrotomies will be reported to the medical director

Transtracheal Jet/Needle Cricothyrotomy PEDIATRIC PROCEDURE (Age approximately <12 y/o):

I. Unless contraindicated by trauma place a small roll under patient's shoulder or slightly extend the neck
II. Locate cricothyroid membrane by tilting patient's head back and palpating for the V-notch of the thyroid cartilage (Adam's Apple)
III. Prepare the skin with antiseptic solution and maintain aseptic technique
IV. Stabilize the thyroid cartilage between the thumb and middle finger of one hand
V. Press index finger of same hand between the thyroid and cricoid cartilage to identify cricothyroid membrane
VI. Using index finger as a guide, rest middle or ring finger of hand holding needle/cannula on the skin to stabilize and prevent needle from penetrating membrane too deeply
VII. Make a puncture in the midline with a smooth motion
VIII. Insert cannula at a 45-60° angle
IX. After entry into trachea, begin removing needle and advancing cannula into place
X. Advance cannula into trachea at a 45° angle with tip toward patient's feet; care must be taken not to kink the catheter when removing the needle and syringe

XI. Draw back on the syringe to aspirate air bubbles to confirm placement in the trachea
XII. Tape cannula securely in place and hold the hub of the catheter to prevent accidental dislodgement while providing ventilation
XIII. Attach 3.0 mm ETT or appropriate adaptor to the end of the catheter
XIV. Ventilate with 100% oxygen using the pediatric BVM via the ETT adaptor; allow for exhalation after each ventilation. The ratio of inhalation to exhalation should be approximately 1:4
XV. Further check airway placement by ventilating and watching chest rise as well as listening for air exchange at site and observing patient for improved color and respiratory condition
XVI. Continue to assess for adequate air exchange
XVII. Provide update of patient's status to hospital and transport immediately
XVIII. All Emergency cricothyrotomies will be reported to the medical director

# 4.10 Epinephrine Push Dose and Drip

Do not give cardiac arrest doses (1 mg) to patients with a pulse.
Do not utilize as first line treatment for shock, initiate only after appropriate other resuscitation measures.

I. Pediatric Patients goals of resuscitation
   A. Avoid hypotension for age (lowest acceptable systolic blood pressure in mmHg)
      1. Less than 1 years of age: 60
      2. 1–10 years old: (age in years) (2) + 70
      3. Greater than 10 years old: 90
   B. Cap refill <3 seconds

BP must be monitored frequently, initially every 3-5 minutes to ensure stability.
Route: IV/IO. Use largest possible line in most proximal location. Closely monitor for extravasation, immediately discontinue if noted and report to receiving facility if noted. May cause tissue necrosis.

I. Perform all steps aseptically
II. Assemble a 1 mg / 10 mL epinephrine syringe and place a double female luer lock adaptor
III. Use an empty 20 mL syringe to draw up 2 mL of the 1 mg / 10 mL epinephrine
IV. With same 20 mL syringe, draw up 18 mL of normal saline to dilute the epinephrine
V. The concentration of epinephrine in the 20mL saline syringe is now 10 mcg/mL
VI. Label the syringe to avoid medication errors
VII. Administer as necessary to meet resuscitation goals

Onset: 1 minute
Duration: 5-10 minutes
Goal: Adult Maintain mean arterial pressure (MAP) >65 mmHg
Adult Dose:
2 mL (20 mcg)- 5 mL (50 mcg) slow IV/IO every 2-5 minutes as needed
Pediatric Dose:
Goal: see pediatric goals of resuscitation above
0.05-2 mcg/kg (max 50 mcg/dose) slow IV/IO every 2-5 minutes as needed

In situations where a continuous infusion is needed, an epinephrine drip for adults may be utilized.

I. Draw up 1mg of either 1 mg / 1 mL or 1 mg / 10 mL epinephrine
II. Inject into a 1 L bag of Normal Saline
III. The concentration of epinephrine in the 1 L is 1 mcg/mL
IV. Label the bag to avoid medication errors
V. Use a 10 gtt/mL macrodrip tubing set and piggyback into primary infusing fluid or administer via IV Pump.
VI. Administer IV/IO as necessary to maintain blood pressure

Onset: Immediate
Duration: Continuous while infused
Goal: Maintain mean arterial pressure (MAP) >65 mmHg
Adult Dose:
**Mild hypotension SBP <80 mmHg**
1 mcg/min or .001 mg/min = 1 gtt every 5 seconds
**Moderate hypotension SBP <70 mmHg**
24 mcg/min or 0.02 mg/min = 4 drops per second
**Severe hypotension (cardiovascular collapse)**
48 mcg/min or .05 mg/min = 8 drops per second

# 4.11 End-Tidal $CO_2$ (Capnography) Monitoring

**Key Considerations:** For $EtCO_2$ to be present, metabolism, perfusion, and ventilation must be occurring.

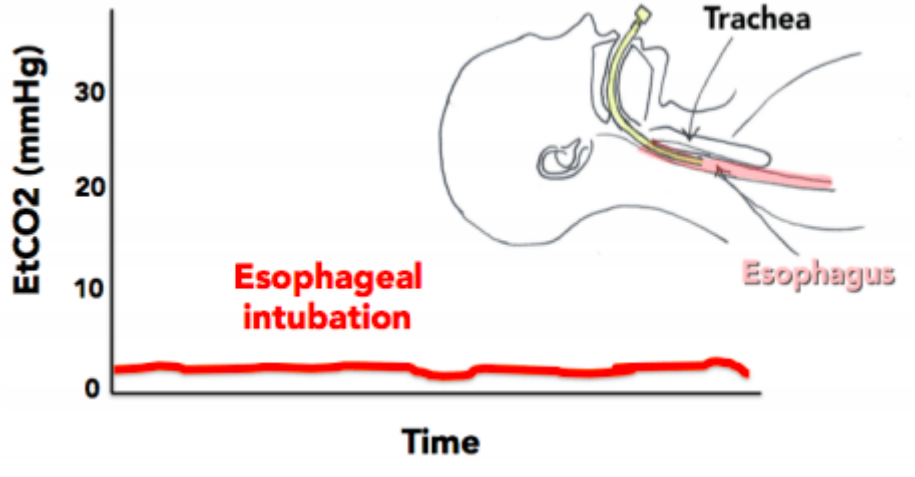
I. $EtCO_2$ value, respiratory rate, and waveform describe airway status
II. If $EtCO_2$ is low and not related to airway status, consider perfusion

Procedure:

I. Attach the appropriate capnography sensor for a patient with an advanced airway or a spontaneously breathing patient
II. Note the $EtCO_2$ level, respiratory rate and waveform. (See below for examples)
III. Normal $EtCO_2$ level is 35 – 45 mmHg
    A. If $EtCO_2$ is low and not related to airway status think perfusion (shock) or respiratory compensation for metabolic acidosis
    B. In patients with possible increased intracranial pressure attempt to maintain an $EtCO_2$ of approximately 35 mmHg
IV. $EtCO_2$ should be monitored as any other vital sign when appropriate when assessing a patient

Interpretation: PQRST Mnemonic

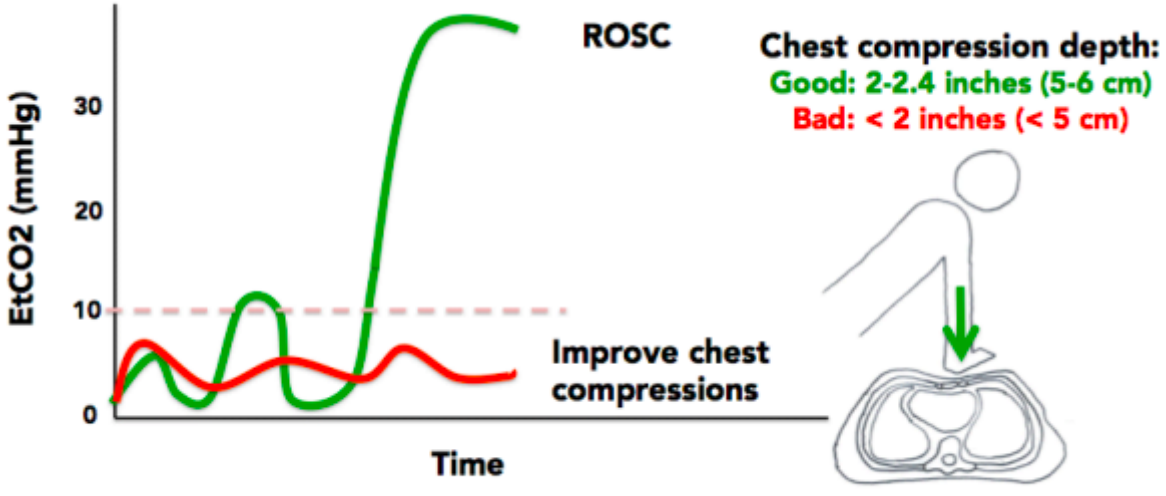
I. Position of the Advanced Airway
    A. Physical exam and fogging of advanced airway alone are not reliable indicators of proper placement of the airway device
    B. Colorimetric $EtC0_2$ may provide a false positive on the first few breaths




II. Quality of CPR
    A. In cardiac arrest, $EtCO_2$ may be low due to poor perfusion and/or metabolism. If $EtCO_2$ is below 10 mmHg, ensure high quality compressions are being performed.
        1. Should aim for >10 mmHg, ideally should be >20 mmHg
    B. Will also indicate rate at which respirations are being given and determine if this needs to be adjusted

C. Return of Spontaneous Circulation

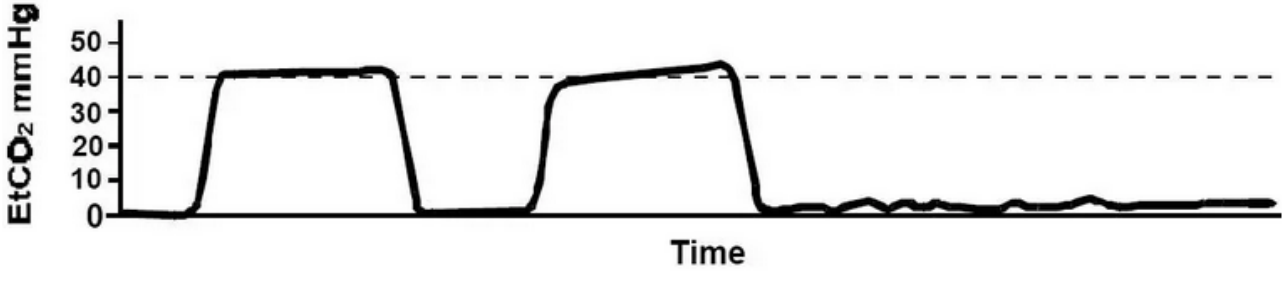
1. In a cardiac arrest a sudden increase in $EtCO_2$ may indicate ROSC
   a) This may be a return to normal values (35-45 mmHg) or an increase of 10 mmHg
   b) Administration of sodium bicarbonate may transiently raise $EtCO_2$ but may not reflect ROSC




This is an example of capnography during CPR. ROSC is reflected by a sudden rise in EtCO2.

D. Strategies for Treatment

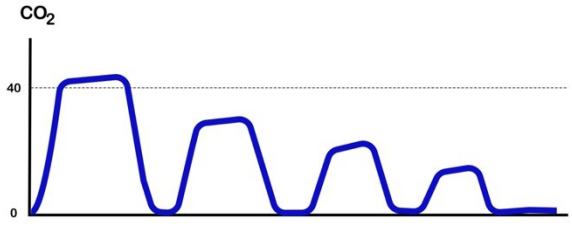
1. The $EtCO_2$ waveform may help guide our next intervention
2. Absence of Waveform may indicate:
   a) apnea, esophageal intubation, tube migration, obstruction




This is an example of a sudden loss of waveform capnography as seen with a dislodged ETT.

3. Loss of Signal may indicate:
   a) Equipment failure - disconnected or malfunctioning bag-valve or ventilator
   b) Soiling of sampler- pulmonary hemorrhage, secretions, etc.

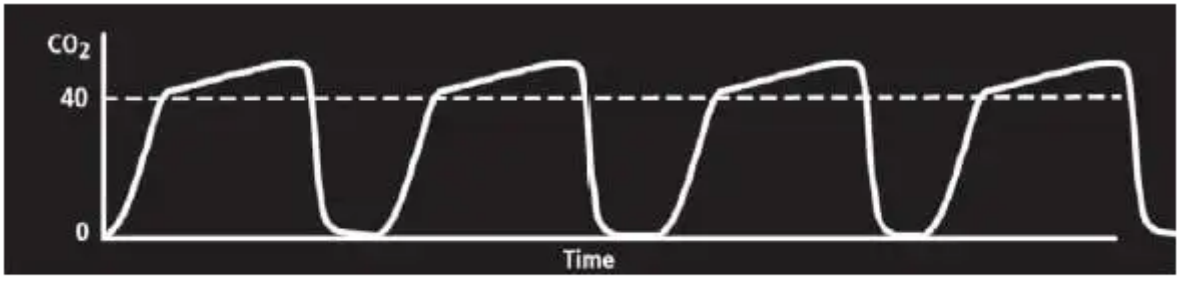
4. Sudden or Continuous Decrease in Value may indicate:
   a) Circulatory collapse – progressive shock, cardiac arrest, massive pulmonary embolism, exsanguination




5. Irregular Phase 3
   a) May be seen in a supraglottic tube placement, right main stem intubation, cuff leak

This is an example of a waveform with an irregular Phase 3, which can be seen in a supraglottic placement, right main stem intubation, or cuff leak.

6. Upsloping Phase 3 (“Sharkfin”)
   a) A waveform with an upsloping phase 3 (“shark fin”) pattern may indicate bronchospasm or a kinked ET tube




This is an example of a waveform that looks like a “sharkfin,” which indicates expiratory obstruction. This can be seen in bronchospasm or a kinked or blocked ETT or circuit.

7. Downsloping Phase 3
   a) Can be seen in emphysema or a pneumothorax

8. Pigtail
    a) A rounded, low waveform with sharp increase in angle at the end of phase 3
    b) Sign of poorly compliant lung tissue, obese chest wall, pregnancy
    c) Patients will rapidly progress from respiratory distress to respiratory failure

E. Termination of Resuscitation
    1. Provides an additional clinical indicator in likelihood of obtaining ROSC
    2. If remains under 10 mmHg despite resuscitation, the likelihood of obtaining ROSC is very low

# 4.12 Eye Irrigation, Morgan Lens Use

Purpose:
Immediate removal of toxic materials or particles from the eyes

Equipment:
Irrigation Fluid, IV tubing

Patient Position:
Preferably supine

Technique:
I. Close clamp on tubing, spike bag of irrigating solution
II. Select/Set tubing to 10 gtts/mL setting
III. Flush IV Line
IV. Place towels, blankets, or catch basin next to patient's head for run-off
V. Gently retract both upper and lower eyelids with fingers. (Retracting upper and lower eyelids separately is acceptable if this is all patient can tolerate)
VI. Hold tip of tubing over eye (avoid touching eye directly). Goal is for nasal to temporal flow of irrigation
VII. Open clamp on tubing to begin flow of saline solution. Adjust flow as needed to obtain good flush
VIII. Instruct patient to alternate looking up, down, and from side to side during fluid flow

Morgan Lens

Indication:
Exposure injury to the eye(s), (i.e. dry or liquid chemical)

Equipment:
I. PPE
II. 1000 mL IV bag Lactated Ringers preferred, or Normal Saline
III. IV tubing (macro drip)
IV. Morgan Lens
V. Tetracaine
VI. Towels or chux

Procedure:
I. Explain procedure to patient and give rationale
II. Use BSI (Body Substance Isolation)
III. Unless contraindicated, instill one or two drops of Tetracaine
IV. Instruct patient not to touch/rub eye(s)
V. Spike IV bag and attach/flush tubing, connect Morgan Lens, maintain sterile environment of Morgan Lens
VI. Have the patient look down, insert the Morgan Lens under the upper lid, then have the patient look up, retract lower lid and allow lens to drop into place
VII. Begin flow rate at wide open and maintain this rate per patient tolerance. Have plenty of towels or chux to absorb flow

# 4.13 EZ-IO PLACEMENT

**Training:**
EZ-IO® infusion systems require specific training/credentialing prior to use.
Site locations: Proximal Humerus (Adults only if landmarks palpable including surgical neck), Proximal Tibia, Distal Femur

**Indications:**
EZ-IO® 25mm (40 kg and over) & EZ-IO® 15mm (3–39 kg) EZ-IO® 45mm (40 kg and over)
**Difficult vascular access in emergent, or medically necessary cases**

**Contraindications:**
I. Fracture of a bone for the limb selected for IO infusion - *use alternate sites*
II. Excessive tissue at insertion site with the absence of palpable identifiable anatomical landmarks - *use alternate sites*
III. Previous significant orthopedic procedures (*IO within 24 – 48 hours, prosthesis - use alternate sites*)
IV. Infection at the site selected for insertion - *use alternate sites*
V. Use for >24 hours
VI. Known Osteogenesis Imperfecta

**Considerations:**
**Flow rate**: Ensure the administration of a rapid and vigorous 10 mL flush with normal saline prior to infusion. "**NO FLUSH = NO FLOW".** Repeat syringe bolus (flush) as needed.
**Pain:** AEMT and above may infuse 2% lidocaine without preservatives, but must be infused **SLOWLY** to prevent it from being sent directly into the central circulation. Medications intended to remain in the medullary space, such as a local anesthetic, must be administered **SLOWLY** until the desired anesthetic effect is achieved.

**Equipment:**
I. EZ-IO Power Driver
II. Appropriate size intraosseous Needle Set based on patient size and weight
III. One (1) EZ-Connect®
IV. Two (2) 10 mL syringes
V. Sterile saline solution for flush **Note:** Paramedic may consider 2% lidocaine without preservative for adults 40 mg, PEDs dose is 0.5 mg/kg maximum dose 20 mg. **Push SLOWLY over 2 minutes, let dwell for 60 seconds prior to administering rapid flush**
VI. Non-sterile non-latex gloves
VII. Antiseptic agent
VIII. One (1) semi-permeable transparent dressing (optional)
IX. One (1) sterile 2x2 or 4x4 gauze pad (optional)
X. One (1) (appropriate volume and type) intravenous solution
XI. One (1) fluid administration set
XII. One (1) fluid administration pump or pressure bag

**Procedure:** *If the patient is conscious, explain procedure and obtain consent*

I. Apply latex free gloves
II. Cleanse site using antiseptic agent
III. Allow to air dry thoroughly
IV. Connect appropriate Needle Set to driver
V. Stabilize site
VI. Remove needle cap
VII. Insert EZ-IO needle into the selected site. IMPORTANT: Keep hand and fingers away from Needle Set
VIII. Position the driver at the insertion site with the needle set at a 90-degree angle to the bone surface
IX. Gently pierce the skin with the Needle Set until the Needle Set tip touches the bone
X. Ensure visualization of at least one black line on Needle Set
XI. Penetrate the bone cortex by squeezing driver's trigger and applying gentle, consistent, steady, downward pressure (allow the driver to do the work)
***Do not use excessive force.** In some patients, insertion may take greater than 10 seconds, if the driver sounds like it is slowing down during insertion; reduce pressure on the driver to allow the RPMs of the needle tip to do the work
*Avoid penetration of the needle through the posterior cortex, if this occurs do not use site and inform hospital staff
    A. Insert per manufacturers recommendations
    B. On adult patients access the distal femur, 5cm proximal from the patella midline and perpendicular
    C. On pediatric patients when you feel a decrease in resistance indicating the Needle Set has entered the medullary space, release the trigger
XII. Remove EZ-IO Power Driver from Needle Set while stabilizing the catheter hub
XIII. Remove stylet from catheter by turning counterclockwise and immediately dispose of stylet in appropriate biohazard sharps container
***NEVER** return used stylet to the EZ-IO kit
XIV. Connect primed EZ-Connect to exposed Luer-lock hub
XV. Confirm placement, ensure no extravasation, discontinue if suspected
XVI. Syringe bolus: flush the catheter with 10 mL of normal saline
*If the patient is responsive to pain, AEMT and above may consider 2% lidocaine without preservatives 40 mg **SLOWLY** over 2 minutes for anesthetic effect. For pediatric patients for pain management **SLOWLY** administer 0.5 mg/kg Lidocaine 2% (not to exceed 20 mg)
XVII. Assess for potential IO complications
XVIII. Disconnect 10 mL syringe from EZ-Connect extension set
XIX. Secure IO as needed
XX. Connect primed EZ-Connect extension set to primed IV tubing
XXI. Begin infusion utilizing a pressure delivery system if needed
XXII. Secure tubing
XXIII. Continue to monitor extremity for complications
XXIV. Any medication or blood product administered intravenously (IV) can also be administered through the intraosseous (IO) route

# 4.14 Intranasal Drug Administration (MAD)

## INTRANASAL MEDICATION DELIVERY PROCEDURE

*using the MAD® Nasal (Mucosal Atomization Device)*

*Intranasal Medication Delivery*

### MATERIALS

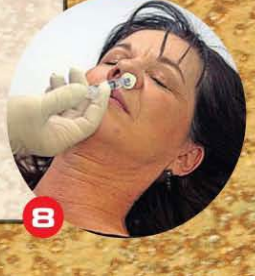
1. MAD® Nasal device with vial adapter and 3ml syringe (Cat. # MAD140)
2. Medication of appropriate concentration for intranasal medication delivery
   - » High concentration – Low volume

### PROCEDURE

1. Remove and discard the green vial adapter cap.
2. Pierce the medication vial with the syringe vial adapter.
3. Aspirate the proper volume of medication required to treat the patient (an extra 0.1ml of medication should be drawn up to account for the dead space in the device).
4. Remove (twist off) the syringe from the vial adapter.
5. Attach the MAD® device to the syringe via the luer-lock connector.
6. Using the free hand to hold the crown of the head stable, place the tip of the MAD® snugly against the nostril aiming slightly up and outward (toward the top of the ear).
7. Briskly compress the syringe plunger to deliver half of the medication into the nostril.
8. Move the device over to the opposite nostril and administer the remaining medication into that nostril.








### KEY CONCEPTS

*To improve Intranasal Medication Delivery success:*

1. Minimize volume, maximize concentration
   - » 1/3 ml per nostril is ideal, 1 ml is maximum
   - » Use the appropriately concentrated drug
2. Maximize total mucosal absorptive surface area
   - » Atomize the drug (rather than drip it in) to cover broad surface area
   - » Use BOTH nostrils to double the absorptive surface area
   - » Aim slightly up and outwards to cover the turbinates and olfactory mucosa
3. Beware of abnormal mucosal characteristics
   - » Mucous, blood and vasoconstrictors reduce absorption
   - » Suction nostrils or consider alternate drug delivery method in these situations

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**Toll Free: 888-380-9808**

# 4.15 Intravenous Infusion Pump (IV pump)

**Purpose:**
Describe the permitted use of an IV infusion pump for administration of medication or fluid.

**Indication:**
Care of a patient requiring specific medication infusions to ensure that medication and/or fluid delivered is at a safe and therapeutic rate. Any medication outlined in these MPESC guidelines with a route of administration identified as either slow IVP or infused intravenously / intraosseous over time may be delivered utilizing an IV pump.

**Equipment:**
IV Pumps shall be FDA approved for use as intended by the manufacturer. IV Pumps shall be approved by the agency and Mercyhealth EMS system for use prior to prehospital care.

**Considerations:**
I. Medications delivered using an IV pump can be provided via IV or IO, regardless of site, catheter size, or patient age
II. The use of an IV Infusion pump in the prehospital setting requires a credentialed/trained paramedic in continuous attendance during use
III. Paramedics who have not completed required competency training on agency specific IV pump make/model with appropriate documentation are not permitted to use the device
IV. Agencies shall provide all in-service and training updates as needed for the use per the manufacturer.
    a. Documentation of this training shall be provided to MPESC upon request
V. Contacting online medical direction is not required for use of the device, but is required for any deviation from agency policy or Mercyhealth medical guideline on its use

**Procedure:**
I. Medications requiring addition to saline prior to infusion will be aseptically mixed immediately prior to administration. Only qualified EMS personnel may mix or concentrate medications to be administered via IV pump. Labeling should be applied to any fluid container to which a medication has been added
II. Primed pump tubing should be inserted into the IV pump and connected into the luer lock IV/IO site or piggy backed into main IV tubing using aseptic technique.
III. The planned infusion should be programmed into the IV pump per manufacturer directions for the specific medication/infusion being administered. Whenever feasible, medications to be delivered and the programmed IV pump infusion will be verified by two qualified paramedics
IV. The medication infusion will be initiated on the IV pump by an appropriately trained paramedic after review of patient allergies, indication, medication concentration and dose
V. The IV pump will be constantly monitored for any alarms. The patient will be monitored with:
    A. Continuous pulse oximetry
    B. Continuous ECG monitoring
    C. Frequent blood pressure monitoring
    D. Evaluation for signs of infiltration at the IV/IO site
VI. IV pumps must be secured safely during movement and transport of patients
VII. All infusions administered via IV pump should be documented in the EPCR with total volume of fluid and/or medication dose infused, including the patient's response to treatment and any complications.

# 4.16 Management of Helmets and Protective Equipment

**Indications:** Helmet or other protective equipment should be removed if preventing access, assessment, or treatment of an injured patient.

**Contraindications:** Delay of emergency patient care to remove equipment which is not preventing access, assessment, or treatment of an injured patient.

**Considerations:**

I. The highest priority is maintenance of circulation, airway, and breathing (CAB). Access to the airway should be ensured before transport in patients with suspected cervical spine injury, altered mental status, airway compromise or high risk of developing airway compromise
II. If there are few or no gaps between the helmet's forehead pad, cheek or jaw pads and the athlete's head and it fits properly, it may not need to be removed. Chin strap should be left in place to secure helmet if it is not removed
III. Removal of only the face guard or visor can decrease the risk of improper movement of cervical spine during suspected injury. Quick release straps may be present to facilitate rapid removal
IV. A screwdriver or specialty tool may be required for removal of helmet face guards or visor, depending on helmet type. For sporting helmets, if the athletic trainer, coach, or team equipment manager is available in a timely fashion, seek their assistance with locating and/or using these tools
V. Other types of protective equipment (e.g. chest protector, extremity pads, ballistic vest) may need to be removed sequentially with the helmet to achieve appropriate spinal motion restriction. Assess neutral in-line position of spine with and without protective equipment prior to decision to remove
VI. Protective equipment is often easily removed by cutting or detaching the securing straps. Avoid cutting directly through the chin strap or protective fabric

**Procedure:**

I. Evaluate whether removal of the helmet and/or other protective equipment is necessary for patient assessment or treatment
II. Position yourself at the head of the patient and have an assistant stand to the side of the patient with access to the head and neck
III. Place one of your assistant's hands behind the occiput and upper neck. Place the assistant's other hand under the patient's mandible with the chin resting in the first webspace and fingers at the angle of the mandible to maintain in-line stabilization of cervical spine during removal of helmet
IV. Place the heels of both your hands at the side of the helmet and insert your fingers into the space between the helmet and patient's face, then gently pull outward to create space
V. Remove the helmet by pulling along the plane of the head and avoid hyperextending the neck. If the lower part of the helmet is stuck at the level of the nose, tilt the helmet posteriorly and pull until you clear the nose. After clearing the nose, return the helmet to the neutral position and continue to pull off the helmet
VI. After removing the helmet, use your hands to hold in-line immobilization while your assistant places the cervical collar or completes the *selective spinal immobilization* assessment.
VII. Apply padding as needed or remove shoulder pads/protective equipment to allow neutral in-line position of spine
VIII. Stabilize injured extremities during removal of other protective equipment to avoid neurovascular compromise
IX. Document neurovascular status of extremities before and after removal of helmet or other protective equipment

# 4.17 Mechanical Compression Device

This procedure describes the appropriate methods to apply, operate, and discontinue mechanical compression devices in a patient requiring chest compressions due to cardiac arrest.

Indications:

I. Mechanical compression devices may be used in adult patients where manual compressions would otherwise be used
II. Use, maintain and clean the compression device per manufacturer guidelines
III. Apply no sooner than the second round of manual compressions. Minimize interruptions

Contraindications:

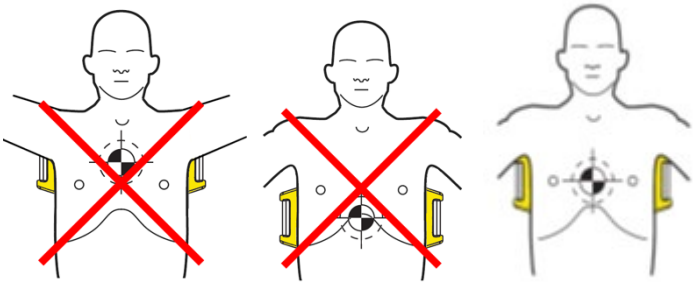
I. Any patient unable to have the mechanical compression device correctly placed and secured due to patient size or other anatomical variation
II. Pediatric patients

Precautions:

I. Refrain from application of mechanical compression device if, by history or physical examination, it is obvious that the patient has had open heart surgery within the last 2-3 months
II. Pregnancy >20 estimated gestational age: Position patient supine with right side elevated 10-15° to prevent decreased venous return associated with compression of IVC by the gravid uterus

Guideline for Placement:

I. Initiate resuscitative measures following Cardiac Arrest guideline. Perform rapid placement of defibrillation pads and early defibrillation as indicated. Perform manual compressions, prior to consideration of placement of mechanical compression device
II. Manual chest compressions should be initiated *immediately* upon recognition of cardiac arrest and continued until the mechanical compression device can be placed without prolonged interruption of compressions. The compression device may need to be placed in a stepwise fashion with placement of the back plate, resuming compressions until the next pulse check, then placement of remaining portions of compression device
III. The mechanical compression device should be placed according to manufacturer guidelines
    A. Center the backplate on the nipple line. The top of the backplate should be located just below the patient's armpits. Defibrillation pads and wires should not be underneath the suction cup



    B. Adjust the compression arm to the correct depth for the patient. If unable to achieve correct compression depth, discontinue use of device and restart manual chest compressions
    C. Initiate continuous compressions as soon as the device is properly positioned and secured
    D. Place the neck roll behind the patient's head and attach the straps to the LUCAS device and place patient's arms in the straps to decrease compression device migration during use

Resuscitation during use of mechanical compression device:

I. Prepare the defibrillator with appropriate charge prior to assessing the patient's underlying cardiac rhythm at a planned pulse check. If the rhythm strip cannot be assessed during compressions, compressions may be paused briefly for analysis. Restart compressions immediately after decision regarding need for defibrillation
II. Defibrillation can and should be performed during mechanical compressions to maintain cardiac perfusion
III. Airway management can be performed during mechanical compressions to maintain cardiac perfusion. If adequate visualization of airway is unable to be obtained during compressions, pause compressions briefly for airway placement and restart as soon as possible. Padding may be placed underneath the patient's head or neck to improve airway alignment. Do not place padding between the patient and the mechanical compression device or under the compression device
IV. Medications should be provided as indicated without interruption of mechanical or manual compressions
V. Assess patient pulses during compressions to ensure adequate perfusion is being obtained. If unable to feel pulses during compressions, check mechanical compression device position and depth of compressions. If unable to correct, remove device and restart manual compressions
VI. Frequently reassess the position of compression arm on patient's chest to ensure correct location. Pause compression device and reposition as needed while minimizing pause time

Discontinuation of mechanical compression device:

I. If the patient moves or is obviously responsive, the mechanical compression device should be paused and the patient evaluated for return of spontaneous circulation (ROSC). If ROSC is present, remove the compression device if it interferes with ongoing patient care. Leave back plate in place to allow rapid restart of mechanical compressions as needed for recurrent cardiac arrest. If no ROSC is present, restart compression device
II. If any disruption or malfunction of the compression device occurs, immediately resume manual chest compressions. If unable to resolve malfunction, remove the compression device and continue manual chest compressions throughout remaining resuscitation efforts
III. If physician orders for termination of resuscitation are received, discontinue and remove mechanical compression device and back plate from the patient. Leave all other tubes and lines in place

# 4.18 PEEP VALVE

**Indications:** PEEP should be considered if equipment is available in pulsatile patients requiring positive pressure ventilation of all age groups to increase alveolar recruitment, reduce risk of repetitive alveolar collapse injury, and increase oxygenation.

Patients presenting with the following history or signs may benefit from PEEP:

I. Conditions prior to respiratory arrest would indicate CPAP
II. Hypoxia despite supplemental oxygen
III. Lung disease prior to intubation such as ARDS, Asthma or COPD
IV. Atelectasis (alveoli collapse)
V. Extended duration of artificial respiration such as interfacility transfer (Greater than 30 minutes)
VI. Pulmonary contusion or flail chest

**Contraindications:**

I. Hypotension: Adult – Systolic BP less than 90 mmHg, lowest normal pediatric systolic blood pressure by age:
    A. Less than one month: > 60 mmHg
    B. One month to 1 year: > 70 mmHg
    C. Greater than 1 year: 70 + 2 x age in years
II. Cardiac Arrest (reduces effectiveness of CPR)
III. Suspected or known pneumothorax

**Special Considerations:**

I. Patients should be monitored closely for pneumothorax
II. Patients with Supraglottic airways in place should be closely monitored for the develop of leak when utilizing PEEP
III. The airway should be monitored closely for the need to suction
IV. Higher levels of PEEP can decrease $EtCO_2$
V. Monitor for stacked breaths (Auto-PEEP) due to incomplete exhalation. (Asthma, COPD)
VI. If at any time ventilation becomes difficult, or hypotension occurs, the PEEP valve should be removed
VII. Decreased tidal volumes are often required to achieve adequate chest rise with PEEP
VIII. Nebulized medications can be administered during PEEP use

**Procedure:**

I. Connect PEEP valve to exhalation port of BVM or ventilator circuit
II. If CPAP was used prior to mechanical ventilation, set PEEP valve to last CPAP level
III. If no previous CPAP, initially set PEEP valve at 3-5 cmH2O (physiologic PEEP)
IV. Titrate PEEP in 5 cmH2O increments as needed to achieve $SpO_2$ >93% and reduce adventitious lung sounds. Frequently monitor blood pressure
V. Contact Medical direction when PEEP greater than 10 cmH2O is indicated

**If abrupt decrease in $O_2$ saturation, evaluate for potential causes **DOPES**:
**Tube Displacement, Obstruction, Pneumothorax, Equipment, Stacked Breaths**

**Referenced Guidelines:** *Respiratory Distress*

**Photo credits:** Ambu USA

# 4.19 PELVIC BINDER

Note: All transport units must be equipped with means to bind the pelvis when indicated.

Goal: To provide circumferential compression to reduce and stabilize a suspected fractured pelvis with the potential to impact hemodynamics. Prompt recognition and treatment during primary survey.

**Equipment:**

I. Appropriately sized commercial pelvic binder
   OR
II. Folded bed sheet

**Indications:**

I. Hemodynamically unstable or potentially unstable patients with a suspected or confirmed traumatic pelvic fracture
II. Pelvic fracture can be suggested by:
   A. Abrasions and contusions around the pelvic area
   B. Superficial hematoma above inguinal ligament, scrotum, and thigh
   C. Limb length discrepancy, deformity, pain and movement of pelvis
   D. Unexplained shock/hypotension in trauma

**Procedure:**

I. Gather equipment and supplies, as needed. Anticipate need for spinal motion restriction
II. Assess pelvic area, distal circulation, sensation, and motor function of lower extremities
III. For sheets, fold smoothly (do not roll the sheet)
IV. Remove objects from patient's pockets or pelvic area. In male patients, make certain genitalia are out of the way
V. Center Pelvic Binder/sheet beneath patient at the level of trochanters (hips) or pubic symphysis
VI. Tighten per manufacturer guidelines or wrap and twist the two running ends of the sheet around the patient's pelvis. Once tightened, cross the running ends and tie, or clamp them to maintain tension
VII. Reassesses distal circulation, sensation, and motor function after splint application

# 4.20 PERICARDIOCENTESIS

Purpose:
To treat life threatening pericardial tamponade. Medical director must be notified of all pericardiocentesis procedures.

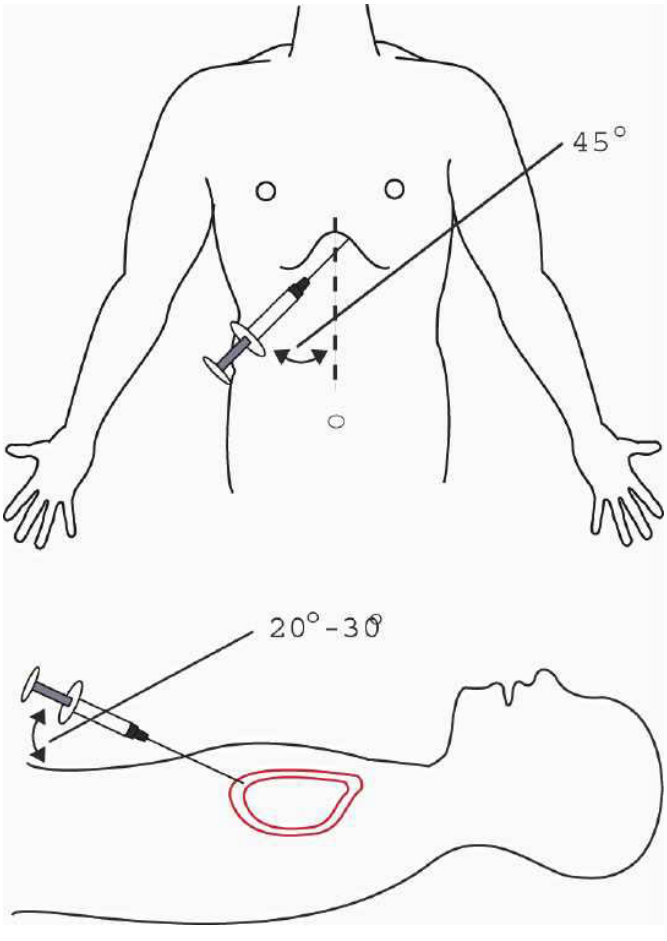
Equipment:
18-22-gauge spinal needle, 20 mL syringe.

Patient Position:
Supine.

Landmarks:
Insertion site is just below and patient left of the xiphoid process.

Technique:
Find landmarks, insert needle at a 90-degree angle to the skin approximately 1cm. Once under skin, direct needle toward inferior tip of left scapula with plunger of syringe retracted slightly during advancement. Stop advancement when blood return appears, aspirate all freely available blood. Remove needle.

Other:
Monitor any changes in EKG.



# 4.21 RAPID SEQUENCE AIRWAY

**Indication:** Protection of patient airway and/or anticipated need for prolonged administration of manual ventilations including:

I. Severe respiratory distress or failure not amenable to other less invasive methods
II. Persistent hypoxia after high-flow $O_2$ and other methods
III. Airway management in a combative/agitated patient
IV. Altered mental status with need to protect/secure airway
V. Airway compromise

**Contraindications:**

I. Known allergy to RSA medications (use available alternatives)
II. Suspected epiglottitis

**Caution:**

I. Intubation should be considered high risk (and reserved for those with inability to be ventilated/oxygenated with other means) for patients presenting with:
   A. Severe oral, mandibular, or anterior neck trauma
   B. Anatomic abnormalities that increase the risk of failed intubation including angioedema
   C. Pediatric, bariatric or pregnant patients

**Procedure:**

I. **Prepare**:
   A. Wide open flowing IV/IO access established. IM Medications have slower onset and are emergency backup only
   B. Increase pre-intubation SBP to goal >100mmHg with IV fluid bolus, if needed. If unresponsive to fluid bolus, refer to procedure for ***Epinephrine Push Dose and Drip*** or use **Levophed** to treat hypotension prior to intubation
   C. Have the following equipment immediately at patient bedside:
      1. Bag-valve with appropriately sized mask
      2. PEEP valve
      3. Supplemental oxygen, nasal cannula and non-rebreather mask
      4. Functional suction device
      5. $EtCO_2$ for waveform capnography
      6. Cardiac monitor
      7. Bougie
      8. Video laryngoscopy device and available direct laryngoscopy equipment
      9. Supraglottic airway
      10. Surgical airway device or equipment
   D. Select and prepare ET tube with stylet or Bougie
   E. *Optimize pH, hemodynamics and oxygenation*

II. **Pre-Oxygenate:**
   A. Initiate continuous $SpO_2$ and cardiac monitoring and continue throughout RSA procedure and during transport
   B. Apply high-flow oxygen via NC (15 LPM) and NRB (25 LPM)/CPAP for 3-5 minutes prior to intubation for spontaneously breathing patient. If providing manual ventilations, provide at least 8 vital capacity breaths at 100% $FiO_2$
   C. Continue high-flow oxygen via NC during intubation procedure

D. If patient experiences persistent hypoxia despite pre-oxygenation as above, consider addition of PEEP valve to the BVM. Continue high-flow oxygen administration via NC

III. **Protect and Position:**

A. Position the head and neck in sniffing position for intubation
B. If no concern for spinal injury, place towels behind the back of pediatric patients to improve visualization
C. Use towels, blankets to ramp up bariatric patients to improve visualization
D. Remove cervical collar and provide manual c-spine stabilization during intubation of trauma patients, if needed for airway visualization

IV. **Pre-paralysis Sedation/Induction (2 RSA trained and credentialed providers at patient's side):**

A. **Etomidate** 0.3 mg/kg IV/IO (max dose 30 mg). Do not repeat any administration of **Etomidate** after initial sedation. Use in older pediatric patients >10 years old or adult patients only

**OR**

B. **Ketamine** 1-2 mg/kg **SLOW** IV/IO (max dose 200 mg), or 4 mg/kg IM (max dose 400 mg). For patients with concern of cardiac ischemia, avoid **Ketamine.** Consider lower dose for patients with hypertension, tachycardia, critical illness or injury, elderly/frail, or SBP <100 mmHg

**OR**

C. If the above are unavailable or contraindicated, use **Midazolam** 0.1 mg/kg IV/IO (max dose 5 mg). Avoid if hypotensive, be prepared to treat resultant hypotension

V. **Paralyze:**

A. Ensure adequate sedation and induction prior to administration of paralytic
B. **Succinylcholine Chloride (Anectine)** 2 mg/kg IV/IO/IM (max dose 200 mg). No repeat dosing
   1. IM Succinylcholine has unreliable absorption and is only to be used in the event of IV/IO failures
   2. Do not repeat dose for long term paralysis after intubation. If inadequate paralysis, contact online medical direction for additional orders. If a repeat dose of **Succinylcholine Chloride (Anectine)** is ordered, have **Atropine** available for possible developing bradycardia, see *Bradycardia Guideline*

**OR**

C. **Rocuronium Bromide** (Zemuron) 1 mg/kg IV/IO (max dose 100 mg). No repeat dosing.
   1. Expect prolonged paralysis after administration, typically greater than 30 minutes

VI. **Placement:**

A. Insert the ET tube until the cuff passes the vocal cords
   1. If unsuccessful after initial attempt, proceed to the Difficult Airway Procedure below
B. Inflate the ET tube cuff
C. Immediately verify correct placement by viewing capnography waveform. Make every attempt to print or upload monitor capnography tracing to PCR
   1. A waveform should be visible with each breath. If not, assume intubation attempt was not successful and remove ET tube. Continue to ventilate patient using other appropriate airway management technique
D. Auscultate for bilateral breath sounds, negative gastric inflation, and equal chest rise
E. Monitor $SpO_2$, correct hypoxia
F. Secure ET tube with commercial holding device, document depth of tube placement, size of ET tube and continue manual ventilations

VII. **Difficult Airway Procedure:**

A. If the rescuer cannot intubate the trachea after one attempt as above, a second attempt at intubation may be indicated. Utilize bougie, alternative visualization device, or additional bedside RSA provider to maximize chance of success. Ventilate and ensure good oxygenation between attempts. If the patient is unable to be ventilated or is hypoxic, proceed directly to a supraglottic airway

B. **Failed Intubation:** If the second attempt to intubate is unsuccessful, proceed immediately to a supraglottic airway and ventilate patient. If utilized, allow succinylcholine effect to wane while ventilating

C. If the supraglottic airway fails or cannot be placed, and rescuer is unable to oxygenate or ventilate via any other means:

1. Consider a surgical airway, bougie cricothyroidotomy [age> approx. 12 y/o], transtracheal jet ventilation, or medical director approved commercial device. See ***Emergency Surgical and Needle Cricothyrotomy***

**MANAGEMENT OF INTUBATED PATIENTS:**

I. Secure ET tube and consider placement of c-collar or manually stabilize head for reduction of motion which could lead to accidental extubation

II. Paralysis may outlast initial sedation. Monitor vitals for tachycardia and hypertension which may indicate inadequate sedation. Provide ongoing sedation and/or pain management per guideline.

III. Monitor cardiac rhythm for signs of hyperkalemia

IV. Goal is to maintain $SpO_2$ 95-99% and $EtCO_2$ 35-45 mmHg

A. For acidotic patients (e.g. DKA, aspirin overdose, TCA toxicity, severe sepsis, crush syndrome), the $EtCO_2$ goal is generally closer to 30 mmHg. Note pre-intubation $EtCO_2$ to target for post-intubation ventilations

V. Provide adequate sedation. Long term paralysis is frequently unnecessary if patient is adequately sedated and soft restraints are utilized. Monitor vitals, as adjustment in sedation drugs may be necessary

A. **Ketamine** 1-2 mg/kg IV/IO (max 200 mg per bolus)

**OR**

B. **Fentanyl** up to 1 mcg/kg IV/IO (max 100 mcg per bolus)

**OR**

C. If possible ongoing seizures or inadequate sedation with other agents, use **Versed** 0.05-0.1 mg/kg IV/IO (max 5mg per bolus)

D. Fluid bolus or administration of **Epinephrine** or **Levophed** may be required to obtain adequate blood pressure to maintain adequate sedation

E. Avoid isolated use of **Fentanyl** for sedation as this does not provide amnestic effect

F. Avoid **Versed** if hypotensive

VI. Long-acting paralytics should only be used on patients at risk of self-extubation or those requiring full muscle paralysis for effective ventilation. Repeat doses are not usually indicated

A. **Vecuronium Bromide (Norcuron)** 0.1 mg/kg IV/IO max of 10 mg x 1

**OR**

B. **Rocuronium Bromide (Zemuron)** 1 mg/kg IV/IO max of 100 mg x 1

VII. Removing the ET tube in the field:
   A. In general, an ET tube should not be removed in the field unless the below indications are met:
      1. The patient wakes up, can maintain their own airway, and any medical indication for intubation has been resolved
      2. The ET tube is obstructed or otherwise not performing adequately
   B. Procedure for removing an ET tube
      1. Place the patient in the recovery position (left side)
      2. Deflate cuff and remove tube
      3. Be prepared to suction the pharynx
   C. Replace ET tube if indicated
   D. Continue to monitor and re-assess the patient frequently

VIII. If patient develops bradycardia, ensure adequate ventilation and recheck tube placement, then see *Bradycardia Guideline*

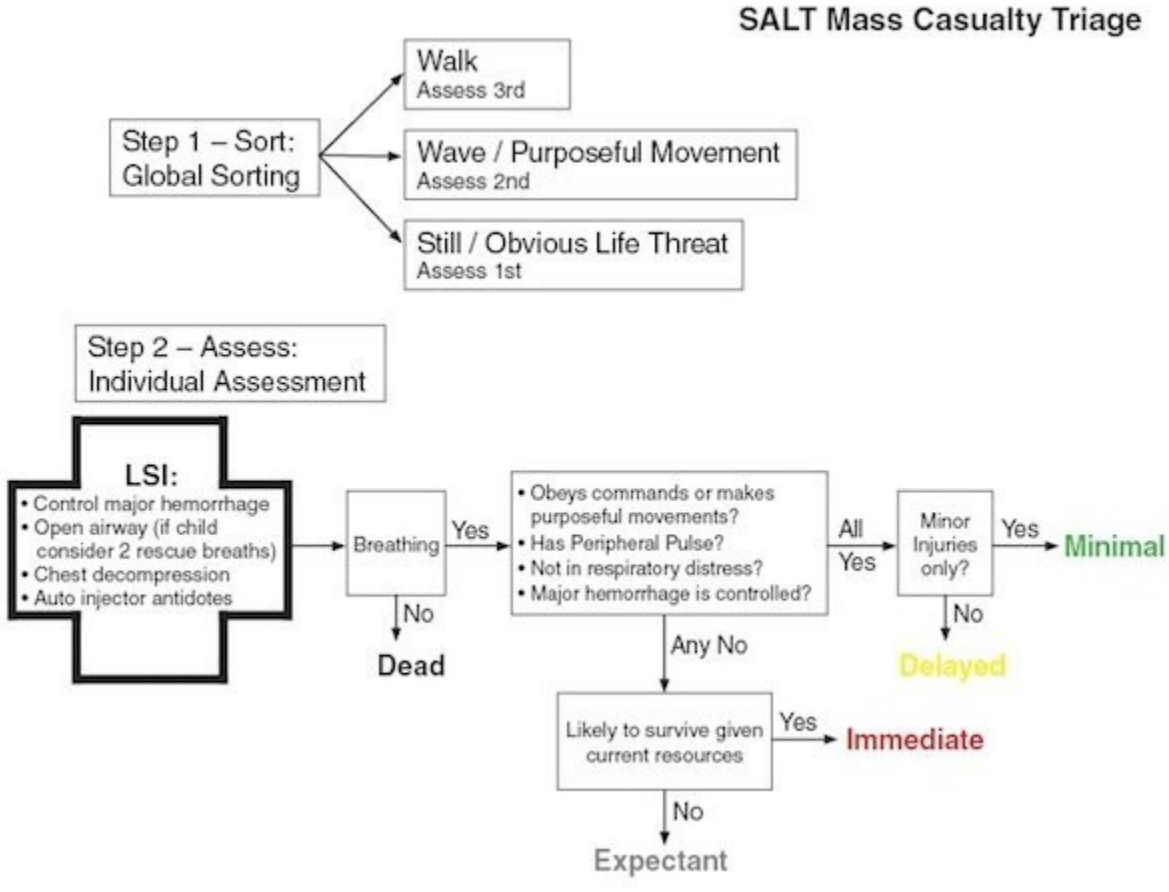
IX. Consider placement of naso/orogastric tube for gastric decompression (if trained and time allows), unless contraindicated by facial trauma, concern skull fracture or other contraindications

X. Monitor closely for signs of pneumothorax, treat tension pneumothorax if indicated. See *Chest Decompression Guideline*

XI. Utilize PEEP if needed to maintain oxygen saturations, monitor blood pressure. See *PEEP guideline*

XII. The mnemonic **DOPES** can help you remember the most common causes of post-intubation hypoxia or deterioration
   A. **D**isplacement
   B. **O**bstruction
   C. **P**neumothorax
   D. **E**quipment failure
   E. **S**tacked breaths

# 4.22 SALT TRIAGE




**Step 1: Sort**
Direct any patients who can walk to a designated safe area. These patients should be assigned last priority for individual assessment. Those who remain should be asked to wave (e.g., follow a command) or be observed for purposeful movement. Those who do not move and those with obvious life threat should be assessed first since they are most likely to need lifesaving interventions.

**Step 2: Assess**
Assess patients based on the above sorting steps, with priority given to those who did not walk to the designated safe area or show purposeful movements. Next, assess those who remained in place but were able to wave or show other purposeful movement. Finally, assess those who were able to walk to the designated area. Remember, triage is a fluid and ongoing process, and patients' conditions may change, so all patients must be assessed and reassessed.

The individual assessment should begin with limited rapid lifesaving interventions.

Life Saving Interventions:

- Control major hemorrhage using tourniquets or by direct pressure provided by other patients or devices
- Open the airway through positioning or basic airway adjuncts. If the patient is a child, give 2 rescue breaths
- Chest needle decompression
- Auto injector/antidotes as needed

Life Saving Interventions should only be performed within the responder's scope of practice and only if the appropriate equipment is immediately available.

Patients should be prioritized for treatment and/or transport by assigning them to one of five categories: Immediate, Expectant, Delayed, Minimal, Dead. If, after life-saving interventions are attempted as indicated, a patient remains not breathing may be triaged as dead, designated with the color black. For patients who are breathing but do not obey commands, **or** do not have a peripheral pulse, **or** are in respiratory distress, **or** have uncontrolled major hemorrhage, triage as immediate, designated with the color red. Providers must also consider those patients with injuries that are likely to be incompatible with life given the currently available resources, and these patients may be triaged as expectant, designated with the color gray. Patients who have mild injuries that are self-limited if not treated and can tolerate a delay in care without increasing their risk of mortality may be triaged as minimal, designated with the color green. The remaining patients may be triaged as delayed, designated with the color yellow.

**Step 3: Treatment and/or Transport**

In a large mass casualty event, treatment may need to be provided on scene for prolonged periods. Consider requesting additional resources, to provide on scene care.

- Transport should be provided to those designated immediate first, then delayed, and then minimal, as resources are available. In extreme circumstances, means of transportation other ambulances, such as buses, may be utilized for transport of appropriate patients.
- Destination determination will depend on the incident location, duration, and scope. Each agency, region, county, or MABAS division may have its own plan in place for MCI communications, follow these plans.
- When possible, patients should be distributed to area hospitals in an effort to not overwhelm any one particular hospital.
- Re-triage frequently for duration of MCI

# 4.23 SPECIAL NEEDS DEVICES

I. CSF SHUNT
   A. Assessment for infection
   B. Assessment for signs of increased intracranial pressure
   C. Ventilate patient if signs of brain herniation (unresponsiveness with equal pupils, fixed, dilated, or unresponsive pupils, or increased blood pressure and decreased heart rate). Ventilation rate should be the higher end of normal or to an $EtCO_2$ of 35 mmHg

II. COLOSTOMY OR ILEOSTOMY
   A. Assessment for infection, irritation/trauma, or peritonitis
   B. Direct pressure if bleeding at site
   C. Apply saline moistened sterile dressing covered by dry dressing if stoma is exposed

III. GASTROSTOMY (FEEDING) TUBE
   A. Assessment for displaced or obstructed tube
   B. Assessment for peritonitis or perforation of the stomach/bowel
   C. Assessment for equipment issues, such as kinked or cracked tubing or infusion pump failure
   D. Direct pressure if there is bleeding at the site
   E. Dry, sterile dressing over the area if tube is dislodged, or tape partially dislodged tube in place
   F. If tube is blocked (as noted by abdominal distension or vomiting) stop the feeding. Attach the connector to the tube and leave tube open and draining into a sterile container
   G. Bring tubing with patient to the hospital for sizing purposed and reinsertion/replacement of the tube

IV. URETEROSTOMY OR NEPHROSTOMY TUBE (OR FOLEY CATHETER)
   A. Assessment for infection, irritation/trauma, peritonitis, blocked urinary drainage
   B. Direct pressure if bleeding at site
   C. Saline moistened sterile dressing covered by dry dressing if stoma is exposed

V. FISTULA, SHUNT, OR ARTERIOVENOUS GRAFT (AV SHUNT)
   A. Blood pressure should not be taken in same extremity
   B. IV should not be started in same extremity
   C. Apply direct pressure to control bleeding at site

# 4.24 Spinal Assessment and Selective Spinal Motion Restriction

**Indication:** Evaluation of patient in the presence of a traumatic mechanism of injury which is concerning for spinal trauma

Examples of possible traumatic mechanisms concerning for spinal injury:

I. Fall from more than 5 stairs
II. Axial load to head (diving)
III. High-Risk Auto Crash:
    A. Partial or complete ejection
    B. Significant intrusion (including roof) of >12 inches at occupant site
    C. Significant intrusion >18 inches any site
    D. Need for extrication for entrapped patient
    E. Death in passenger compartment
    F. Child (age 0–9 years) unrestrained or in unsecured child safety seat
IV. Rider separated from transport vehicle with significant impact (e.g. motorcycle, ATV, horse, etc.)
V. Pedestrian/bicycle rider thrown, run over, or with significant impact
VI. Fall from height > 10 feet (all ages)

**Contraindication:** Patient with altered mental status or otherwise unable to cooperate with directions or examination.

**Procedure:**

I. Manually stabilize head and neck of the patient in the position found while completing further assessment for spinal motion restriction unless movement is needed to open the airway
II. Assess the patient and document presence or absence of:
    A. Neck or back pain
    B. Neck or back midline tenderness with palpation of spinous processes
    C. Numbness, tingling or weakness in any extremity
    D. Distracting injury
    E. Evidence of alcohol or drug intoxication
    F. Inability to communicate
    G. Major trauma to the head or face
    H. Altered level of consciousness on exam
    I. Age ≥65 years old
    J. Torticollis in children
III. If any of the above criteria are met, the patient should have a cervical collar applied for spinal motion restriction. See #8 below if patient is refusing cervical collar application, do **NOT** continue with assessment of movement and ask patient to voluntarily restrict spinal movement if possible
IV. If all the above criteria are negative, have the patient move their neck 45° to either side of midline, flex, and extend neck. If patient experiences pain or focal neurologic deficit with these movements, spinal motion restriction is indicated. Document examination result
V. Assess motor and sensory function before and after spinal motion restriction and regularly during transport
VI. Patients requiring spinal motion restriction should be transported supine or with the head of the bed minimally elevated
VII. Only remove a C-collar that has already been applied if you need to examine the neck (reapply when complete), for insertion of endotracheal tube (reapply when complete) or if the application is causing

more harm than good due to increased patient movement, pain or agitation. Document reason for removal

VIII. Patients may refuse indicated spinal motion restriction after discussion of risks and benefits, even while accepting other aspects of EMS care or transport. Potential risks of transport without cervical collar in the presence of the above criteria include permanent damage to spinal nerves, numbness, weakness or paralysis, incontinence of urine or stool, and rarely, death. Document reason for refusal

**Spinal Restriction Techniques**

I. Ambulatory patients
   A. Alert, cooperative patients may be allowed to self-limit movement, but a cervical collar is recommended
   B. Instruct patient to sit on the cot. Secure the patient in position of comfort. Limit the movement of the neck during this process, maintain in-line neutral position. Apply appropriately sized cervical collar. If the cervical collar does not fit, use alternate mode of stabilization

II. Non-ambulatory patients
   A. Place the patient in the best position suited to protect the airway, maintain in-line neutral position while applying appropriate spinal motion restriction. Apply appropriately sized cervical collar. If the cervical collar does not fit, use alternate mode of stabilization
   B. Extricate patient as needed by the safest method available. Limit flexion, extension, rotation and distraction of the spine. Tools such as pull sheets, scoop stretchers, KED, vacuum splints and long spine board may be used as required
   C. A long spine board should only be used for extrication or short-term patient movement. Maintain spinal motion restriction while rolling patient laterally for removal of long spine board as soon as possible
   D. If backboard is needed to immobilize long bone fractures, move patients, or in unique extrication/resuscitation/transport scenarios apply padding as needed.

III. Alternate modes of stabilization
   A. Use towels or blankets to support the head and minimize movement

**Special considerations**

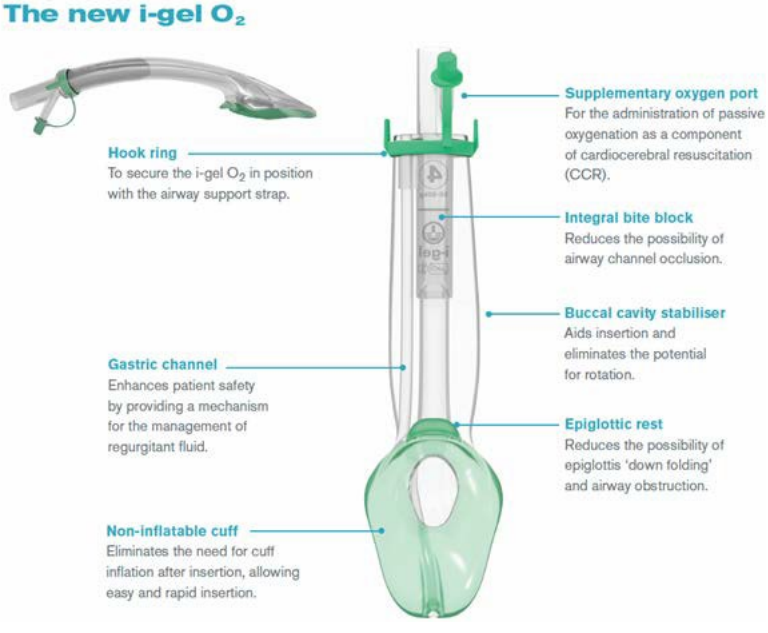
I. Patients with penetrating trauma and **without** spinal pain or neurological deficits do not need spinal motion restriction

II. **Pediatric Spinal Motion Restriction**
   A. Consider leaving the child in their uncompromised car seat, if available, with added padding to minimize movement of head and cervical spine
   B. If the child's parent/guardian is available, include them in the child's care
   C. If the child has been removed from the vehicle/car seat, consider the use of pediatric spinal motion restriction device or an adult device with additional padding if it provides a more appropriate fit. If this restriction causes increased agitation, movement and potential harm to the child, consider placing the child in a car seat and pad to restrict movement
   D. Children may require additional padding under the shoulders to avoid excessive cervical spine flexion

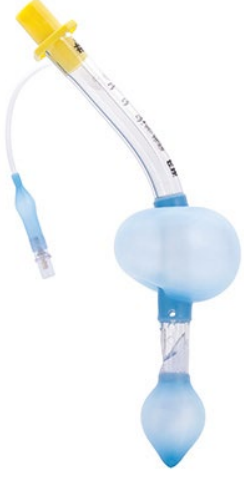
# 4.25 SUPRAGLOTTIC AIRWAYS

The current medical director approved Supraglottic Airways for adult and pediatric patients are the King Airway and the i-gel. One device may be carried. No other devices may be used without express written permission of the medical director. All personnel must be trained prior to utilizing these devices for patient care.

i-gel Airway




King Airway



**Indications**: Either device should be sized based on manufacturer guidance for patients with no gag reflex in need of advanced airway.

**Contraindications:**

I. Responsive patients with an intact gag reflex
II. Known esophageal disease
III. Caustic substance ingestion
IV. Patients with laryngectomy / tracheostomy
V. Complete airway obstruction
VI. Foreign body aspiration
VII. Pharyngeal hemorrhage

**Monitoring:** $EtCO_2$ with continuous waveform should be utilized if available to ensure proper ventilation with the device. Ensure working suction is available, suction as needed. Placement confirmation with colorimetric capnometry is required if continuous waveform $EtCO_2$ unavailable.
When using the colorimetric capnometry purple should change to Gold if $CO_2$ is present in the exhaled air.

Colorimetric Capnometry


**Procedure:**

<u>i-gel</u>

I. Have another trained provider ventilate the patient. Determine appropriate size i-gel
II. Open packaging and gently lubricate device
III. Open patient's mouth and insert device until it seats in position. If difficulty occurs, consider smaller size i-gel
IV. Attempt to ventilate patient. The chest should rise, there should be breath sounds, and absent epigastric sounds. If unable to ventilate, the device may be too deep or too shallow, adjust device and attempt to ventilate again. If unable to ventilate, remove device and resume BVM ventilations. Consider larger size i-gel and re-attempt if inadequate BVM ventilations
V. Confirm per *Routine Medical Care Guideline*
VI. Secure with strap, tape or commercial tube holder
VII. If equipped with suction port, consider placement of soft suction catheter to reduce aspiration risk

## I-GEL Airway Chart

| Size | Patient Criteria | Color |
|---|---|---|
| 1.0 | Neonate – 2-5 kg | Pink |
| 1.5 | Infant - 5-12 kg | Blue |
| 2.0 | Small Pediatric – 10-25 kg | Grey |
| 2.5 | Large Pediatric – 25-35 kg | White |
| 3 | Small Adult – 30-60 kg | Yellow |
| 4 | Medium Adult – 50-90 kg | Green |
| 5 | Large Adult – 90+ kg | Orange |

King

I. Have another trained provider ventilate the patient. Determine appropriate size King
II. Open packaging, inflate pilot balloon and leak check with manufacturer recommended volume of air. Gently lubricate device
III. Open patient's mouth and insert device until proximal portion of tube adaptor is at teeth or gumline. If difficulty is met, do to force, consider smaller size King
IV. Inflate to manufacturer's recommended volume of air and gently withdraw device
V. Once device is seated, attempt to ventilate patient. The chest should rise, there should be breath sounds, and absent epigastric sounds. If device is not ventilating, it may be too deep or too shallow, adjust device and attempt to ventilate again. If unable to ventilate, remove device and resume BVM ventilations. Consider adding additional air to cuff or replacing with larger size King airway.
VI. Confirm per *Routine Medical Care Guideline*
VII. Secure device with commercial tube holder
VIII. If equipped with suction port, consider placement of soft suction catheter to reduce aspiration risk

# 4.26 Traction Splint for Femur Fracture

**Indications**: Suspected isolated mid shaft femur fracture.

**Contraindications:**

I. Injury to ipsilateral knee, hip, pelvis, ankle, lower leg
II. Wounds over anchor points
III. Suspected fracture proximal or distal to mid shaft femur

**Procedure:**

I. Upon recognizing the injury, Rescuer One should stabilize leg in the position found
II. Rescuer Two will then expose the injured leg
    A. Assess neurological function distal to injury site
    B. Assess circulatory function distal to injury site
III. Rescuer Two should prepare traction splint
    A. Adjust splint to length of uninjured leg
    B. Secure
IV. Rescuer Two should apply the ankle hitch to the patient
V. Secure Proximal Anchor
VI. Rescuer One will now move the splint into position
VII. Applying mechanical traction until the pain and muscle spasms are improved
    A. Maintain manual traction until the mechanical traction takes over
    B. Traction can be stopped when the injured leg is approximately the same length as the uninjured leg
VIII. Secure the remaining straps around the leg avoiding suspected fracture site
IX. Reevaluate all of the straps. When splint is properly applied, the patient's foot should be upright
X. Reassess circulatory and neurological function distal to injury site. Compare to original findings and note any changes

Notes:

I. If the patient is determined to be in shock, do not waste time applying the traction splint. Splint the injured leg against the uninjured leg to expedite transport
II. Continue to reassess circulatory and neurological function distal to injury site during transport

# 4.27 USING KED (KENDRICK EXTRICATION DEVICE)

The KED can be used as a splint for pelvic stabilization and hip and/or femur stabilization. Two possible methods of adaptation are shown here.

## HIP AND/OR FEMUR STABILIZATION (Figure 1)

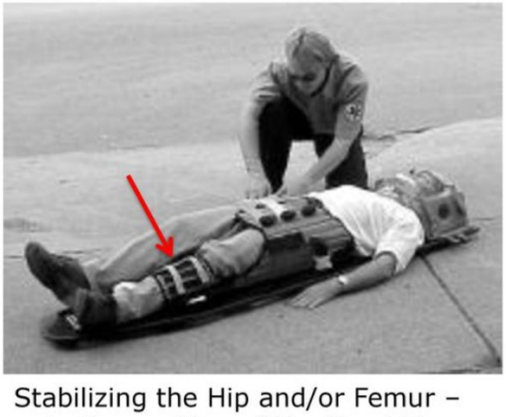
The KED is placed along the side of a supine patient with the head portion of the KED toward the foot end of the patient.

The torso portion of the KED positioned a little above the waist and centered. The torso flaps are secured around the patient and the head flaps are wrapped around the patient's **injured leg** and secured with the KED head straps.

## PELVIC STABLIZATION (Figure 2)

The KED is placed alongside a supine patient with the head portion of the KED toward the foot end of the patient. Note: this should not be used in place of a pelvic binder for concern for hemorrhagic shock.

The torso portion of the KED positioned a little above the waist and centered. The torso flaps are secured around the patient's pelvic area and the head flaps are wrapped around **both legs** and secured with the KED head straps.



Stabilizing the Hip and/or Femur – note the position of the Head Flaps

**Figure 1: Stabilizing Hip/Femur**

Stabilizing the Hip and/or Femur – note the position of the Head Flaps

**Figure 2: Stabilizing Pelvis**

# 4.28 VENTILATORS

**Guideline: Prehospital Ventilator Use by Credentialed Paramedics**

**Purpose**

I. To provide clear guidelines for the appropriate use of mechanical ventilators in the prehospital setting for patients who are intubated during cardiac arrest, post-ROSC care, or following rapid sequence intubation (RSI).

**Indications**

I. Mechanical ventilation may be initiated by paramedics in the following situations:
II. Cardiac arrest with a secured advanced airway (e.g., endotracheal tube, supraglottic airway).
III. Post-ROSC care when ventilatory support is continued
IV. Post-Delayed Sequence Intubation (DSI) when the patient requires ongoing ventilatory support.
V. Bi-Level Positive airway pressure – Non-invasive airway management

**Contraindications**

I. Inability to confirm correct airway placement.
II. Inadequate ventilator function or failure of equipment.
III. Patient with spontaneous breathing but no advanced airway in place.

**Equipment**

I. Portable transport ventilator capable of ACV and SIMV modes.
II. End-tidal $CO_2$ monitor (waveform capnography).
III. Pulse oximeter.
IV. Backup bag-valve-mask (BVM) with oxygen.
V. Ideal Body Weight (IBW) chart to assist in calculating tidal volume. The chart is provided at the end of the protocol.

**Procedure**

I. Confirm placement of advanced airway with $ETCO_2$, chest rise, breath sounds, absent abdominal sounds, and securement.
II. Select appropriate ventilator mode:
    - **Assist-Control Volume (ACV)** for patients in cardiac arrest, post-ROSC, or not initiating breaths.
    - **Synchronized Intermittent Mandatory Ventilation (SIMV)** for post-RSI patients with spontaneous respiratory effort.
III. Set initial ventilator parameters based on patient condition:

**For Cardiac Arrest: (Six-dial Strategy)**

I. Ventilator Mode:
    - Assist-Control Volume (ACV)
II. Tidal Volume (Vt):
    - Set to 400 mL to avoid barotrauma and ensure adequate alveolar ventilation
III. Respiratory Rate (RR):
    - Set to 6 breaths per minute during active chest compressions
IV. $FiO_2$ (Fraction of Inspired Oxygen):
    - Set to 100% to maximize oxygen delivery during resuscitation
V. PEEP (Positive End-Expiratory Pressure):
    - PEEP should be set to 0 cm $H_2O$ to avoid impairing venous return during CPR

VI. Trigger Sensitivity:
- Disable patient-triggered breaths during CPR to avoid asynchronous breaths interfering with chest compressions.

VII. I:E Ratio (Inspiratory: Expiratory Time Ratio):
- Set to 1:5 to provide adequate expiratory time, allowing complete exhalation and reducing auto-PEEP.

**For Post ROSC:**

I. Ventilator Mode:
- Assist-Control Volume (ACV)
- Synchronized Intermittent Mandatory Ventilation (SIMV) – if the pt. is breathing spontaneously

II. Tidal Volume (Vt):
- Set to 3-5 mL/kg of ideal body weight

III. Respiratory Rate (RR):
- Set to 10 breaths per minute but should be adjusted to maintain normal $ETCO_2$ between 35-45 mmHg

IV. $FiO_2$ (Fraction of Inspired Oxygen):
- Start at 100% and titrate to keep $SpO_2$ between 94%-98%

V. PEEP (Positive End-Expiratory Pressure):
- PEEP can be used if needed for oxygenation, but be mindful of increased intrathoracic pressure, reducing venous return, and maintaining cardiac output. Use the lowest amount of PEEP while maintaining target $SpO_2$ levels.

VI. I:E Ratio (Inspiratory: Expiratory Time Ratio):
- Set to 1:2 or 1:3

**For Post-DSI**

I. Ventilator Mode:
- *Synchronized Intermittent Mandatory Ventilation* (SIMV)
- Assist-Control Volume (ACV)

II. Tidal Volume (Vt):
- 3-5 mL/kg ideal body weight

III. Respiratory Rate (RR):
- 18-22 breaths per minute

IV. $FiO_2$ (Fraction of Inspired Oxygen):
- Start at 100%, titrate to maintain $SpO_2$ between 94%-98%

V. PEEP (Positive End-Expiratory Pressure):
- Don't use if the pt. has a systolic <90 (MAP <65)
- 5 cm $H_2O$ (May titrate as needed)

VI. I:E Ratio (Inspiratory: Expiratory Time Ratio):
- Set to 1:2 or 1:3

**Bi-Level Positive Airway Pressure**

COPD/Asthma

I. Pressure Settings
- 12/6 cm $H_2O$ (IPAP/EPAP)

II. Respiratory Rate
- Spontaneous

III. Flow Trigger
- 2-3 L/min

CHF

I. Pressure Settings
   - 16/8 cm $H_2O$ (IPAP/EPAP)

II. Respiratory Rate
   - Spontaneous

III. Flow Trigger
   - 2-3 L/min

*All Settings should be titrated to the patient's:

I. Comfort
II. $SpO_2$ (94-98%)
III. $ETCO_2$ (35-45 mmHg)

**Monitoring and Reassessment**

I. Continuously monitor $SpO_2$, $ETCO_2$, and vital signs.
II. Observe for adequate chest rise and breath sounds.
III. Reassess ventilator settings every 5–10 minutes or with changes in patient condition or transport status.
IV. Be prepared to return to BVM ventilation if the ventilator fails or the patient's condition worsens.
V. Use DOPE mnemonic

**Transport Considerations**

I. Secure ventilator and airway devices.
II. Ensure sufficient oxygen supply and battery charge.
III. Maintain access to manual ventilation equipment.
IV. Document ventilator settings, time initiated, and any adjustments made during transport.

## Ideal Body Weight (IBW) chart:

| Height (cm) | Height (feet) | IBW (kg) | Female | IBW (kg) | Male |
|---|---|---|---|---|---|
| <152 | <5'0 | 45 | <50 | 50 | <50 |
| 155 | 5'1 | 47.7 | <50 | 52.7 | 55 |
| 157 | 5'2 | 49.6 | <50 | 54.6 | 55 |
| 160 | 5'3 | 52.3 | 55 | 57.3 | 60 |
| 163 | 5'4 | 55.0 | 55 | 60.0 | 60 |
| 165 | 5'5 | 56.8 | 60 | 61.8 | 65 |
| 168 | 5'6 | 59.6 | 60 | 64.6 | 65 |
| 170 | 5'7 | 61.4 | 65 | 66.4 | 70 |
| 173 | 5'8 | 64.1 | 65 | 69.1 | 70 |
| 175 | 5'9 | 65.9 | 70 | 70.9 | 75 |
| 178 | 5'10 | 68.7 | 70 | 73.7 | 75 |
| 180 | 5'11 | 70.5 | 75 | 75.5 | 80 |
| 183 | 6'0 | 73.2 | 75 | 78.2 | 80 |
| 185 | 6'1 | 75.0 | 75 | 80.0 | 80 |
| 188 | 6'2 | 77.8 | 80 | 82.8 | 85 |
| 191 | 6'3 | 80.5 | 85 | 85.5 | 90 |
| 193 | 6'4 | 82.3 | 85 | 87.3 | 90 |
| 196 | 6'5 | 85.0 | 85 | 90.0 | 90 |
| 198 | 6'6 | 86.9 | 90 | 91.9 | 95 |

# SECTION 5 SCORES AND SCALES

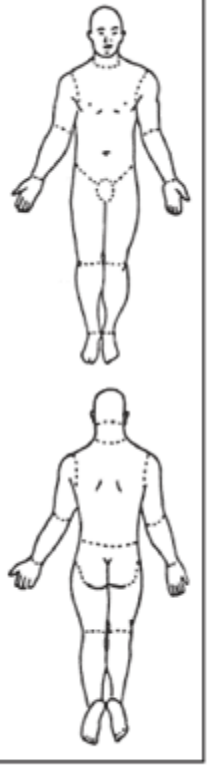
# 5.01 APGAR SCORE

| Sign | 0 | 1 | 2 | 1 min | 5 min |
|---|---|---|---|---|---|
| Heart Rate | Absent | <100/min | >100/min | | |
| Respiratory (Effort) | Absent | Slow or Irregular | Normal, Crying | | |
| Muscle Tone | Limp | Some Extremity Flexion | Active, Good Extremity Motion | | |
| Irritability (Grimace) | No response | Grimace, Crying, Some Motion | Strong Crying, Vigorous | | |
| Skin Color | Blue or Pale | Pink Trunk, extremities blue | Pink Throughout | | |
| **Total Score** | | | | | |

# 5.02 Burn Estimation

| *Area* | *Birth to 1 year* | *1 to 4 years* | *5 to 9 years* | *10 to 14 years* | *15 years* | *Adult* | *2nd** | *3rd** | *TBSA* |
|---|---|---|---|---|---|---|---|---|---|
| Head | 19 | 17 | 13 | 11 | 9 | 7 | | | |
| Neck | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| Anterior trunk | 13 | 13 | 13 | 13 | 13 | 13 | | | |
| Posterior trunk | 13 | 13 | 13 | 13 | 13 | 13 | | | |
| Right buttock | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | |
| Left buttock | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | |
| Genitalia | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Right upper arm | 4 | 4 | 4 | 4 | 4 | 4 | | | |
| Left upper arm | 4 | 4 | 4 | 4 | 4 | 4 | | | |
| Right lower arm | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| Left lower arm | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| Right hand | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | |
| Left hand | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | |
| Right thigh | 5.5 | 6.5 | 8 | 8.5 | 9 | 9.5 | | | |
| Left thigh | 5.5 | 6.5 | 8 | 8.5 | 9 | 9.5 | | | |
| Right leg | 5 | 5 | 5.5 | 6 | 6.5 | 7 | | | |
| Left leg | 5 | 5 | 5.5 | 6 | 6.5 | 7 | | | |
| Right foot | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | | |
| Left foot | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | | |
| | | | | | | Total: | | | |

Burn diagram



**—Second-degree burns are now more often designated as superficial partial-thickness or deep partial-thickness burns, and third-degree burns are designated as full-thickness burns.*

# 5.03 GLASGOW COMA SCALE

- The Glasgow Coma Scale provides a score in the range 3-15. The total score is the sum of the scores in three categories. For adults the scores are as follows:

| | | |
|---|---|---|
| **Eye Opening Response** | Spontaneous - open with blinking at baseline | 4 points |
| | Opens to verbal command, speech, or shout | 3 points |
| | Opens to pain, not applied to face | 2 points |
| | None | 1 point |
| **Verbal Response** | Oriented | 5 points |
| | Confused conversation, but able to answer questions | 4 points |
| | Inappropriate responses, words discernible | 3 points |
| | Incomprehensible speech | 2 points |
| | None | 1 point |
| **Motor Response** | Obeys commands for movement | 6 points |
| | Purposeful movement to painful stimulus | 5 points |
| | Withdraws from pain | 4 points |
| | Abnormal (spastic) flexion, decorticate posture | 3 points |
| | Extensor (rigid) response, decerebrate posture | 2 points |
| | None | 1 point |

For children under 5, the verbal response criteria are adjusted as follow

| SCORE | 2 to 5 YRS | 0 TO 23 Mos. |
|---|---|---|
| 5 | Appropriate words or phrases | Smiles or coos appropriately |
| 4 | Inappropriate words | Cries and consolable |
| 3 | Persistent cries and/or screams | Persistent inappropriate crying &/or screaming |
| 2 | Grunts | Grunts or is agitated or restless |
| 1 | No response | No response |

# 5.04 TRAUMA SCORES

## ADULT TRAUMA SCORE

The Trauma Score is a numerical grading system for estimating the severity of injury. The score is composed of the Glasgow Coma Scale (reduced to approximately one-third value) and measurements of cardiopulmonary function. Each parameter is given a number (high for normal and low for impaired function). Severity of injury is estimated by summing the numbers. The lowest score is 0, and the highest score is 12.

| | | |
|---|---|---|
| **RESPIRATORY RATE** (spontaneous patient-initiated inspirations/ minute) | 10 - 29 / minute | 4 |
| | greater than 29 | 3 |
| | 6 - 9 minutes | 2 |
| | 1 - 5 / minute | 1 |
| | None | 0 |
| **SYSTOLIC BLOOD PRESSURE** | Greater than 89 | 4 |
| | 76 - 89 mm Hg | 3 |
| | 50 - 75 mm Hg | 2 |
| | 1 - 49 mm Hg | 1 |
| | No pulse | 0 |
| **GLASGOW COMA SCALE** (see above) | 13 – 15 | 4 |
| | 9 – 12 | 3 |
| | 6 – 8 | 2 |
| | 4 – 5 | 1 |
| | 3 | 0 |
| **TOTAL POSSIBLE SCORE** | | **0 – 12** |

# PEDIATRIC TRAUMA SCORE (PTS)

| COMPONENT | +2 | +1 | -1 |
|---|---|---|---|
| **Size** | >20 kg<br>>5 years old | 11 – 20 kg<br>1 – 5 years old | ≤10 kg<br><1 year old |
| **Airway** | Normal | Maintainable | Unmaintained or intubated |
| **Systolic BP*** | >90 mmHg | 50 – 90 mmHg | <50 mmHg |
| **CNS** | Awake | Obtunded/lost Consciousness | Coma/unresponsive |
| **Skeletal Injury** | None | Closed fracture | Open/multiple fractures |
| **Open Wounds** | None | Minor | Major/penetrating |

*Score range is from -6 to +12*
*Score of less than 8 usually indicates the need for evaluation at a Trauma Center*
**If a proper sized blood pressure cuff is not available, blood pressure can be rates as: +2 = palpable at wrist; +1 = palpable at groin; -1 = no palpable pulse*

PEDIATRIC TRAUMA SCORE

| | VALUES | | |
|---|---|---|---|
| COMPONENT | +2 | +1 | -1 |
| Size | ≥ 20 kg | 10 – 20 kg | ≤ 10 kg |
| Airway | Normal | Maintainable | Unable to maintain |
| CNS | Awake | Obtunded | Coma |
| Systolic BP | ≥ 90 mmHg | 50 – 90 mmHg | ≤ 50 mmHg |
| Open wound | None | Minor | Major |
| Skeletal Injuries | None | Closed fracture | Open or multiple fractures |

Revised Trauma Score

| Glasgow Coma Scale (GCS) | Systolic Blood Pressure (SBP) | Respiratory Rate (RR) | Coded Value |
|---|---|---|---|
| 13-15 | >89 | 10-29 | **4** |
| 9-12 | 76-89 | >29 | **3** |
| 6-8 | 50-75 | 6-9 | **2** |
| 4-5 | 1-49 | 1-5 | **1** |
| 3 | 0 | 0 | **0** |

# SECTION 6 TEMS GUIDELINES

# 6.01 INTRODUCTION TO TEMS GUIDELINES:

Only those Paramedics with Tactical Endorsements and acting during a tactical event will operate under these guidelines. Tactical EMS providers will be required to undergo additional training and skills evaluation at the discretion of the EMS Medical Director.

Tactical EMS providers shall be comprised of experienced Paramedics who are selected by the EMS service director, the EMS Medical Director, and the SWAT Commander. Once deployed, or while actual training is underway, the Paramedics shall be under command of the SWAT Team Leader. All medical procedures shall be performed on an as need basis based on the circumstances and shall be carried out under authority of written guidelines or direct orders of the EMS Medical Director or Associate EMS Medical Director.

Once a patient is moved outside the warm zone perimeter, usual and customary practice shall commence. This typically shall occur once the patient is taken to the ambulance or a casualty collection point. The hospital which may receive patients from the SWAT encounter shall be notified that a SWAT call is underway. No other information is required.

All actual SWAT calls shall have a debriefing done. The medical director should be present at SWAT calls and debriefings when possible.

A Tactical Run File shall be instituted and kept in accordance with EMS Medical Director and State Office of EMS guidelines. All patient encounters and sick calls shall have a formal run sheet filled out. Minimal assistance or First Aid assessments of police officers do not require a run sheet, but documentation of the assistance given should be kept.

A Medical Threat Assessment shall be completed for all SWAT calls and training which has special logistics that puts officers and medical crews at risk. This assessment shall be given to the SWAT Commander.

When the Tactical EMS team is deployed outside their service area, Medical Direction shall remain with the EMS Medical Director or Associate EMS Medical Director, unless an accountable, pre-arranged and qualified Medical Direction source is identified and approved by the EMS Medical Director. The EMS Medical Director should be contacted when possible anytime a deployment is made outside the immediate area and arrangements made for voice contact if necessary.

These Tactical Guidelines will cover some specific care issues unique to medical care rendered while involved with a SWAT incident. It should be clear that TEMS Guidelines are in addition to the Mercy EMS Guidelines, and those guidelines should be referenced when the TEMS guidelines don't cover a specific situation.

# 6.02 TEMS APPROVED MEDICATIONS

Adenosine 6 mg pre-load syringe
Adenosine 12 mg pre-load syringe
Albuterol solution for nebulizer
Amiodarone 150 mg vials
Aspirin 81 mg chewable tablets
Atropine 1 mg pre-load syringe
Atrovent solution for nebulizer
Benadryl 50 mg pre-load syringe
Dextrose 50% pre-load syringe
Epinephrine 1 mg / 1 mL ampule
Epinephrine 1 mg / 10 mL pre-load syringe
Glucose for oral use
Ketamine 500 mg vial
Lidocaine 100 mg pre-load syringe
Magnesium Sulfate 5 g Pre-load syringe
Dilaudid/Hydromorphone 2 mg pre-load syringe
Narcan 2 mg pre-load syringe
Nitroglycerine spray 0.4 mg per dose
Norcuron 10 mg vial
Ondansetron 4 mg pre-load syringe and Ondansetron ODT
Tetracaine 1 bottle
TXA 1 g unit vial
Solumedrol 125 mg vial
Succinylcholine 100 mg vial
Versed 5 mg vial

Over-The-Counter (OTC) Medications (to be used in accordance with manufacturer instructions) approved to be carried by TEMS providers but not used to treat Patients:
Ibuprofen 200 mg tablets
Kaopectate
Loratadine 10 mg tablets
Sudafed tablets
Acetaminophen 500 mg tablets
Pepto Bismol
Imodium
Pepcid

# 6.03 AIRWAY MANAGEMENT

TEMS Paramedics will require expert airway skills and validation of these skills by the medical director. Oxygen will be provided per guidelines unless oxygen is unavailable due to the tactical situation. Oxygen will be administered as soon as the tactical situation permits.

It is feasible that the tactical situation will prohibit the use of BVM ventilations and/or endotracheal intubation. If this is the case and the patient needs a definitive airway, the supraglottic airway shall be placed as necessary. It is entirely permissible to remove the Supraglottic Airway and intubate if the patient condition warrants once outside the perimeter in a controlled setting. Nasal airways are acceptable airway devices in the hot zone or during care under fire period.

Rapid sequence airway may be instituted when felt appropriate by the Tactical Paramedic and the patient is unable to maintain their own airway. The Mercy EMS guidelines for RSA will be followed, but a colorimetric indicator may be used to immediately confirm tube placement in the hot zone if an $EtCO_2$ monitor is unavailable. It is mandatory that an advanced airway be checked and monitored for efficacy after every patient movement. A low threshold for surgical or supraglottic airway is expected of TEMS Paramedics.

If penetrating trauma has occurred to the chest and a tension pneumothorax is suspected, the Tactical Paramedic shall relieve the tension immediately using a large bore angiocath (14g 3.25" minimum). Place the needle into the chest 4th/5$^{th}$ intercostal space at the anterior axillary line. Once tension is relieved, remove the needle and leave catheter in place. Move the patient to safety once able and arrange for rapid transport as this patient will need a chest tube as a definitive treatment. Repeat as needed. Cover all sucking chest wounds with vaseline gauze or commercially available chest wound dressing. All four sides should be occluded, there is no role for an open side as this does not effectively relieve a tension pneumothorax and increases risk of drawing air into chest cavity.

# 6.04 HEMORRHAGE CONTROL

Normal treatments should be used when possible to control bleeding including direct pressure and/or tourniquet. The SAM junctional tourniquet is approved for inguinal and axillary use by TEMS trained medics.

For wounds to the neck, chest, or areas where a tourniquet can't be utilized, the use of HemCon, Combat Gauze, or other commercially available non-exothermic hemostatic dressings are to be utilized.

Dress **open wounds associated with fractures** with saline-moistened gauze, administer ***Ancef*** 2 grams (PEDS dose 30 mg/kg) as IVP diluted in 5 mL sterile water over 3-5min or infusion in 100 mL NS over 15-30 min.

For adult patient that is hypotensive (SBP <90 mmHg) or tachycardiac (HR >110 BPM) administer **TXA** 2 g IV/IO over 20 minutes. For unstable pediatric patients administer **TXA** 30 mg/kg (maximum 2 g). Make sure transporting service is aware that patient received TXA, so receiving facility is aware. TXA should not be administered more than 3 hours after the time of wounding. TXA may also be given for patients with Traumatic Brain Injury less than 3 hours ago and GCS 12 or lower.

# 6.05 USE OF IV FLUIDS

An IV or IO may be established at any time feasible. Use Normal Saline and follow routine guidelines. It is understood that needed IV access may be delayed until outside the perimeter if the situation warrants. In the event of prolonged scene and transport time LR is the preferred fluid for hemorrhagic shock resuscitation. LR is not compatible with blood transfusion and a secondary IV access with blood tubing and NS, or flushing the line with NS would be required.

# 6.06 SPINAL IMMOBILIZATION

Unless operating in a hot zone, selective spinal immobilization techniques shall be utilized. Routine use of c-spine precautions in penetrating trauma is not indicated.

If emergency evacuation from the hot zone is needed, and this movement is approved by the SWAT Commander, move the patient rapidly to a safe zone in the most appropriate manner. Once in a safe area, use selective immobilization techniques.

Perform neuro checks once the patient is safe and document these. Document why initial spinal immobilization was not done and how the person was moved.

# 6.07 CARE OF SWAT PERSONNEL

**Sprains and sprains:** Ibuprofen 600 mg PO, Tylenol 1 g PO, ice pack and elevate extremity. An ACE wrap may also be applied. Do not apply so tight that circulation is impaired.

**Minor Allergies:** Consider personal use of Loratadine OTC as per manufacturer guidelines.

**Anaphylaxis:** Epinephrine 1 mg / 1 mL 0.5 mg IM as per routine care. Benadryl 50 mg PO/IM/IV/IO. Solu-Medrol 125 mg IV/IO/IM.

**Fever:** If over 101 degrees F, advise SWAT Commander to remove from duty. For any level of fever, administer Acetaminophen, 1,000 mg PO or Ibuprofen 600 mg PO.

**Abrasions:** Check Tetanus status. If greater than 5 years advise officer to be immunized in next 72 hours. Clean wound, apply antibiotic ointment and dress as appropriate.

**Diarrhea:** Provide Kaopectate, Pepto Bismol, or Imodium for personal use.

# 6.08 WOUND CARE

**Lacerations:** If the wound is deep and pulls apart, it will likely require closure in the ED. Tetanus status may need to be updated with a vaccination. At times, you may be hours from an ED. In this case, it is important to stop bleeding and mitigate infection. Cleanse the wound with copious irrigation fluid and dress as appropriate. Advise SWAT Commander and patient of need for definitive care. Consider use of MD-1 physician for field response.

# 6.09 TRIAGE

Triage techniques should be utilized when feasible. The ability to get to injured persons and to perform triage may be inhibited or require modification based on the tactical circumstance.

The SWAT Commander dictates all activities of personnel, including Tactical Paramedics. Once threats are eliminated and the Commander deems an area secure, the Tactical EMS Personnel shall approach and triage as appropriate and feasible.

It is imperative that all non-SWAT persons be searched prior to removal to safe zone for treatment and transport.

When numerous victims are present and it is deemed safe to approach by the SWAT Commander, advise the need for appropriate ambulance support. Remove victims in order of need providing only the needed life-saving care such as airway and severe bleeding control. Allow safe zone crews to provide definitive management.
Approach of victims requires a direct order from the SWAT Commander UNDER ALL CIRCUMSTANCES.

**OTHER MEDICAL CARE ISSUES:**
Use of medications per routine guidelines for any encountered emergency is approved. Treat as time, situation, and equipment/meds available permit. Once to the safe zone, move to the ambulance and treat patients per standing medical guidelines. Contact medical direction any time you feel it is necessary and situation permits this communication.

# 6.10 USE OF MARK 1 INJECTOR KITS

THIS DEVICE IS FOR SWAT TREATMENT ONLY
The Mark 1 Kit contains two medications, Atropine and 2-Pam, both in automatic syringes and is used by crew members who have been exposed to nerve gas (Sarin, VX, Tabun, Soman) or organophosphates.
Symptoms of exposure include:

S – Salivation
L – Lacrimation (tearing)
U – Urination
D – Defecation
G – GI upset (cramps)
E – Emesis
M – Muscle Weakness or Twitching

1. Clear the area immediately. Do not stay downwind from scene.
2. Call for help and advise of threat so other responders are prepared.
3. Administer Mark 1 Kit to your crew partner or self as necessary.
4. Decontaminate yourself if agent is on skin or clothes. Do not move the emergency to a new location. Understand that you need immediate medical treatment and move to hospital ASAP.

PROCEDURE:

A. Remove Kit from package.
B. Select injection site. Any large muscle area is OK. Thigh is good place. May inject through clothing.
C. With your dominant hand grasp the Atropine auto injector which is the smaller of the two. Do not put your hand or thumb over the needle site.
D. Pull the auto injector out of the clip with a smooth motion. The injector is now armed.
E. Hold the auto injector between two fingers and your thumb like a pencil.
F. Position the green end onto the injection site. Stay away from joints.
G. Apply firm pressure (do not jab) until the needle goes into the skin.
H. Hold continuous pressure for 10 seconds to allow medication to be administered.
I. Remove the auto injector from the injection site and dispose of the device into a sharps container.
J. Remove the large auto injector which is 2-Pam. The black end is the needle end.
K. Repeat the steps above.
L. Dispose of device into sharps container.
M. Transport to hospital. You are now a patient, not a responder.

If SLUDGEM Symptoms are seen in anyone, immediate evacuation is mandatory. Inform the SWAT Commander that Nerve Gas appears to be in the area and rapidly withdraw from the area when the command is given to do so. Re-entry to the area for any person is prohibited until a response team geared for this emergency is on scene.

Decontaminate in a warm Zone before transport. If Mark I kits are exhausted, administer 3 mg of Atropine IV or IM as soon as possible to others in need.

# SECTION 7 – REFERENCED FORMS

**Mercyhealth Prehospital and Emergency Services Center Physician On-Scene Form**

ON-SCENE PHYSICIAN RESPONSIBILITY ACKNOWLEDGMENT

Thank you for your offer of assistance. Be advised the EMS personnel are operating under the authority of state law and regulations. No physician or other person may intercede in patient care without the Mercyhealth EMS Medical Director, or their appropriate designee, relinquishing responsibility of the scene or otherwise giving approval in accordance with EMS Regional and State guidelines.

**If YOU ARE A PHYSICIAN AND DESIRE TO ACCEPT RESPONSIBILITY FOR AND DIRECTION OF THE CARE OF THE PATIENT(S) AT THE SCENE:**

1. You MUST show your medical license to the EMT and verbalize your specialty.
2. You MUST accompany any patient whose care you direct to the medical facility in the ambulance or other attending medical vehicle.
3. Your direction of a case MUST be approved by the Mercyhealth EMS Medical Director or their appropriate designee.

*Please print except for your signature:*

I, _____ M.D. / D.O., assume full responsibility for the prehospital direction of medical care of the patient(s) identified below during this ambulance call, and I will accompany the patient(s) to the medical facility. I understand that the Mercyhealth EMS Medical Director, or his or her appropriate designee, retains the right to resume responsibility for the medical care of such patient(s) at his or her discretion in accordance with Mercyhealth Prehospital and Emergency Services Medical Guidelines at any time, and that the care of the patient(s) will be relinquished to the appropriate personnel upon arrival at the medical facility. Patient Identification (please initial and provide information as appropriate):

_____ All patients at the scene, OR
_____ The following patient(s):
_____
_____
_____ _____
Physician Signature (M.D. / D.O.) Date_____/_____/_____
IL Physician License Number_____

Specialty_____

EMS Personnel to complete:
Run Number _____ EMT Initials _____

**Mercyhealth Prehospital and Emergency Services Mass Refusal Form**

Date: / / Location of Call_____
Time: Dispatched: _____En route:_____ Arrived:_____ Completed: _____
Agency: Unit#: _____Call-#: _____
Type of incident: _____
_____

Medical Direction contacted? _____ M.D./D.O./ECRN Name:_____

## REFUSAL OF CARE/TRANSPORT AND RELEASE FROM LIABILTY

I, ***listed below***, am refusing care and transport to a hospital following the above incident. I acknowledge that all refusals carry the risk that my medical condition could get worse, up to and including death. In voluntarily making this decision, I release the Emergency Medical Services System(s), their affiliated hospital(s), physicians, and personnel from any responsibility for the worsening of my medical condition. If my medical condition worsens, I should call 911.

**Print Name** **DOB**

1. _____
Address _____
2. _____
Address _____
3. _____
Address _____
4. _____
Address _____
5. _____
Address _____
6. _____
Address _____
7. _____
Address _____

_____ _____
**Signature of EMS crew #l** **Signature of EMS crew #2**

If School Bus Accident: signature of authorized school designee: _____

## Rehab Tracking Form

| | | |
|---|---|---|
| Date: | Incident Address: | |
| Incident Command: | Rehab Division Manager: | |
| Ambient Temp: | Wind Speed: | Humidity: |
| Dept: | Ambulance #: | Incident #: |
| Ambulance Personnel: | | |

| Name, Dept, Company | | # Bottles | Time IN: Time OUT: | Vitals x 3 Times: | B/P | Pulse | Resp. | Temp. | $SpO_2$ | SpCO | Additional Info |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | | | | | | | | | | | |
| B | | | | | | | | | | | |
| C | | | | | | | | | | | |
| D | | | | | | | | | | | |
| E | | | | | | | | | | | |
| F | | | | | | | | | | | |
| G | | | | | | | | | | | |
| H | | | | | | | | | | | |
| I | | | | | | | | | | | |