



Mercyhealth Pre-Hospital & Emergency Services Center Medical Guidelines for Illinois EMS Providers

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SECTION 1 MERCY EMS ADMINISTRATIVE GUIDELINES

1.0 INTRODUCTION

- I. It is the understanding of the Medical Director that care is to be initiated for all patients upon assessment. Care will be provided in accordance with DHS 110 for WI EMS providers and IDPH (210 ILCS 50) for IL EMS providers. Care will be provided in accordance with applicable laws, rules, regulations, and these medical guidelines.
- II. Ambulances will be equipped with a copy of these protocols, all necessary patient care equipment and medications at the appropriate service level, and communications equipment (cellular phone, mobile and portable radios). This is in addition to any state equipment and supply requirements.
- III. The EMS Medical Director or On Call EMS Physician is available for consultation via phone. EMS Providers can be patched to this phone by calling RockCom at (815)968-0993.
- IV. To request an MD-1 response to a pre-hospital incident, contact RockCom at (815)968-0993. The EMS Medical Director or On Call EMS Physician will respond with EMS in the field when available and may respond to any call to provide on-scene assistance when available. When the EMS Medical Director or On Call EMS Physician is providing care in the field, they will be the medical direction. The receiving hospital is also authorized to provide on-line medical control 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.
- V. The following guidelines are to be used by all EMS Personnel under the medical direction of Mercyhealth System's EMS Medical Director in the pre-hospital setting once contact with a patient has been made.
 - A. All actions and treatments not qualified by the statement **Contact Medical Control** may be carried out without specific medical order or contact with Medical Control.
 - B. Actions qualified by the statement **Contact Medical Control** must have a verbal order from the appropriate On-Line Medical Control Physician.
 - C. In the event that communications cannot be established, are disrupted, or lost between the EMT and the hospital, document and continue to follow these guidelines including orders which typically require a verbal order. Every effort should be made to contact the hospital by cell phone, radio, or landline telephone. The EMS Medical Director or On Call EMS Physician must be made aware of these types of occurrences.
 - D. These guidelines are in effect until the patient arrives at the hospital and the patient's care has been turned over to the medical or nursing staff.

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- E. In situations where immediate action to preserve and save lives supersedes the need to communicate directly with the hospital, the requirement for Medical Control orders may be lifted provided guidelines/ recommendations are followed and/or sound medical judgment is used.
- F. If MD-1 responds on-scene , MD-1 will supplement, not replace, regularly assigned field personnel, and in most cases they will provide oversight and assistance. They will work at all times under the existing ICS.

Examples of incidents (not all inclusive) when an on-scene physician may be beneficial:

- Mass Casualty Situations
- Prolonged entrapments
- Structural Collapse
- Multiple Alarm Fires
- To provide surgical intervention if required
- To provide on-scene medical direction at major incidents
- To assist with triage and treatment at mass casualty incidents
- To provide operational and logistics support at mass casualty or prolonged incidents
- Other complex incidents where the IC determines their assistance would be of value
- Additional medications not carried by EMS (ex. Antibiotics, Cyanokit, Pitocin for post-partum hemorrhage)

On-scene care should not be delayed awaiting MD-1 arrival. Ambulances should initiate transport as soon as able, intercepting with MD-1 where possible. If the situation improves and a response is no longer necessary, the on-scene IC may request the response to be cancelled. MD-1 EMS Physicians have the authority to perform all skills and utilize all medications in these protocols. In addition, the MD-1 EMS Physicians may utilize additional medications approved by the medical director. Additional MD-1 EMS Physician procedures may also include additional skills such as tube thoracostomy, use of ultrasound, wound closure, fracture care, dislocation reduction, junctional tourniquets, central venous access, lateral canthotomy, life-saving amputation, and peri-mortem c-section.

- VI. Pediatric patients are addressed within the appropriate clinical care guideline. Although the medication doses vary, the procedures seldom change. Any specific adjustments are highlighted and identified where needed. The pediatric patient is identified by the development of puberty. Puberty is easily identified by breast development in females and underarm hair in males. Any child who has gone through puberty, gets the adult dose of medication. For those children under puberty and don't fit the Broselow tape, use ½ the adult dose. The Broselow tape or approved medical director product or app should be utilized for a more accurate dosing regime in patients under 30 kg or 4 feet. Pediatric ETT should be cuffed.

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- VII. All medical devices, IV pumps, ventilators, medications, and instruments must be approved by the EMS Medical Director prior to any patient use. Reference to specific makes, models, or manufacturers is for illustrative purposes only and is not an endorsement.
- VIII. Any guideline guides, references, notes, and patient care forms, whether written or electronic format must be approved by the EMS Medical Director.
- IX. All EMS providers at all levels will be required to undergo a credentialing process established by the medical director prior to providing any patient care. EMS providers will routinely be evaluated by skills evaluation, simulation, written exams, and QA activities. If providers are deemed by the medical director to be operating in an unsafe manner, they will be immediately suspended from patient care activities. Any providers requiring remediation will do so in the manner prescribed by the medical director.
- X. All EMS providers and students will at all times adhere to medical direction 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 medical director requirements. Providers may not utilize medications, devices, or perform skills that they are not credentialed, trained, and confident utilizing.
- XI. All Paramedics performing RSA will be required to complete additional RSA training, airway skills, and evaluation per medical director requirements.
- XII. Outdoor Emergency Care Technicians(OEC) will follow the First Responder guideline except where OEC Technicians have received additional training in skills approved by the medical director. For these skills, the OEC Technicians will follow the EMT Basic guideline.
- XIII. High risk medications such as Epinephrine 1mg/1ml, Succinylcholine, and Vecuronium should be labeled with high visibility markings. Epinephrine 1mg/1ml should be easily identified for IM use only. Placing it with a small volume syringe and IM needle will further reduce risk. Succinylcholine and Vecuronium should be easily identified as a paralytic.
- XIV. Generic substitution of medications and auto injectors are equivalent and acceptable even if these medications are not specifically named in the protocol. Alternative substitution during drug shortages or other situations will be addressed in real time by medical director.
- XV. Patients refusing to relinquish their weapons, whether or not they may legally carry, may be considered a refusal of care. If at any time, a crew feels unsafe they should immediately leave the area. All firearms and weapons should be handled by law enforcement personnel when possible on scene. EMS providers should not make efforts to safe or disable any weapons. Weapons should be left secured in their holsters or purses even if that means cutting the belt or other securement devices away from the holster or purse to detach from patient. If weapons need to be transported by EMS, they should be transported in a secure area outside the patient's reach. Document who the weapons were given to whether law enforcement or hospital security personnel.

- XVI. Agency controlled substance policies are to be reviewed by the medical director, pharmacist, and agency representatives. Controlled substances must be stored securely with the utmost oversight. Audit trail electronic safes should be used when possible. Any discrepancy must be reported immediately to the EMS system coordinator or medical director.
- XVII. All ambulance units are dispatched on a dedicated frequency. The officer or crew should acknowledge the dispatch or as appropriate call en-route, on-scene, and when transporting to hospital destination. 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.
- XVIII. Once dispatched, the EMS crew is obligated to respond to the incident barring mechanical failure. Assuring that someone is responding to the incident is a critical responsibility of both the crew and dispatch center. Departments 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.
- XIX. If cancelled while en-route due to corrected dispatch information, you should proceed to provide initial care and hand off to the transporting ambulance when they arrive. If the other ambulance will arrive first, then you can end response and return if they do not need further assistance. Once dispatched, you should only be cancelled by appropriate authority after an attempt to assess the patient or locate the patient. Downgrading to non-emergent response is reasonable based on updated dispatch information, but no responders should be cancelled until an initial physical assessment of the patient has been completed by an EMS provider.
- XX. SALT Mass Casualty Triage Algorithm (Sort, Assess, Lifesaving Interventions, Treatment/Transport) will be the official triage method.
- XXI. Where a skill or medication is mentioned for specific indication in a protocol for Paramedics, the Intermediate EMT(199) may perform those listed below. An Intermediate EMT(199) will be required to meet the same (and at times more stringent) system education and skill requirements of the Paramedic prior to acting in this role. Only Intermediate EMT(199) approved and credentialed by the EMS Medical Director will act in this capacity.
- XXII. The Intermediate EMT(199) shall only perform the following skills above EMT Basic level: ECG monitoring, Morgan lens eye irrigation, intubation, Magill, stoma suctioning, tracheostomy intubation, starting and maintaining IVs/IOs, drawing blood, needle decompression for thoracic injury, manual defibrillation, and pacing. The Intermediate EMT shall only administer the following medications: adenosine, amiodarone, atropine, benzodiazepines, dextrose, diphenhydramine, epinephrine, lidocaine, ondansetron, fentanyl, and methylprednisolone.

- XXIII. Blood glucose should judiciously be checked when it guides patient care. Routine use of blood glucose meters on alert patients without recent history of signs or symptoms of dizzy/weak/palpitations/falls/diaphoresis/confusion/CVA/altered mental status is usually not clinically indicated. Blood glucose evaluation should not be routinely utilized during cardiac arrest, as it is highly inaccurate.
- XXIV. EMS Providers are mandatory reporters of child and elder abuse. Any suspected abuse should be immediately reported to local law enforcement to provide immediate safety for at risk individuals. Ensure mandatory reporting is completed and documented immediately after safety of EMS and individual is accomplished.

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1.2 UNIVERSAL PRECAUTIONS

I. GLOVES

A. All personnel under the following conditions shall wear gloves

1. All patient contact.
2. If you are in contact with blood or blood products or other body fluid and secretions.
3. During contact with articles or surfaces potentially contaminated by the patient.
4. During placement of intravenous lines or while drawing blood.
5. While doing any other surgical or invasive procedure.
6. While cleaning re-usable equipment contaminated with body fluids or blood.
7. During all decontamination procedures.
8. Gloves used in the patient care area should not be worn in the drivers' compartment.

B. Gloves are to be disposed of after single use.

II. MASKS

- A. Masks should be worn any time there is risk of splash, spray or aerosolization of body fluids.
- B. Masks should be worn during intubation or when suctioning an intubated patient.
- C. Properly fitted N95 masks should be used when caring for patients with respiratory transmissible diseases.
- D. Masks should be placed on patients or over oxygen delivery devices as source control of respiratory borne illness.

III. EYE PROTECTION

- A. Eye protection should be worn any time there is risk of splash, spray or aerosolization of body fluids.
- B. Eye protection should be worn during intubation or when suctioning an intubated patient.
- C. EMTs wearing glasses should consider using additional eye shield.

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IV. GOWNS

- A. A gown should be worn any time there is risk of splash, spray or aerosolization of body fluids.
- B. Clothes contaminated with blood or body fluids should be appropriately laundered or discarded.

V. NEEDLESTICK INJURIES and SIGNIFICANT EXPOSURES

- A. Needles, blades, and other sharp objects must be disposed of immediately in a proper sharps rigid wall container. Used needles should in no way be manipulated by hand.
- B. Blunt fill needles, self-blunting needles, safety catheters are to be considered the standard. The use of non-safety style devices is considered hazardous. Use of extension sets to draw blood and start the IV will additionally reduce the amount of contact with blood.
- C. Personnel who may have a significant exposure of their own blood stream, mucous membrane, or eye with body secretion from a patient should notify the Emergency Department to which the patient was brought to at once.
- D. NEEDLE STICK INJURIES MUST BE REPORTED TO SUPERVISOR AS SOON AS POSSIBLE.**

VI. MISCELLANEOUS

- A. Thorough hand washing with and running water is mandatory after every patient encounter.
- B. Direct mouth-to-mouth resuscitation is not recommended.
- C. All specimens transported from a patient known or suspected to have HIV or hepatitis should be so marked.
- D. While not mandatory, it is highly recommended that all EMTs be vaccinated for Hepatitis B followed by appropriate titer to demonstrate immunity. In some cases, a second series may be warranted.
- E. HEPA filters should be utilized when possible in the respiratory circuit. Reduce aerosolizing procedures when possible with respiratory transmitted diseases.

VII. Lifting Precautions

- A. Automatic loading cots and adequate personnel for lifting are to be used to prevent injury to providers and patients. Appropriately sized bariatric equipment is also to be utilized when necessary.

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1.4 COMMUNICATION BETWEEN AMBULANCE CREW AND MEDICAL CONTROL

1. When communication with Medical Control and/or receiving facility has been established, briefly advise the receiving facility of the following:
 - A. Unit Designation and Level of Service
 - B. Patient's age
 - C. Chief Complaint
 - a) Early notification of STEMI, Stroke, or Trauma followed by a detailed report once en route.
 - b) If requesting orders/interventions, state these first.
 - D. Brief History of Present Illness including mechanism of injury (if appropriate)
 - E. Brief summary of symptoms, exam findings (including vital signs) and your impressions
 - F. Any medications the patient takes that may impact on the current problem
 - G. Monitor interpretations (if applicable)
 - H. Treatment you have rendered
 - I. An approximate ETA

2. Find the appropriate Guideline. Carry out all instructions exactly as written in the Guideline.
 - A. Contact Medical Control for orders if
 1. Unable to determine the appropriate Guideline.
 2. Circumstances require deviation from the appropriate Guideline.
 3. You reach a point in the appropriate Guideline where Contact Medical Control is indicated.
 - B. Repeat the orders to Medical Control exactly as you receive them; and once confirmed, carry them out exactly as ordered.
 - C. If in your opinion, the orders you receive are inappropriate and/or dangerous to the patient,
 1. Question the physician 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 that run sheet should be given to the Medical Director within 48 hours. DHS and IDPH rules require that a copy of the run form or other documentation approved by the department and receiving hospital must be left with the receiving hospital. All reports will be completed in accordance with appropriate state requirements and when required entered into state designated computer reporting systems.

3. Transfer of care must be a formalized process to ensure important data is not missed. Healthcare providers must all communicate effectively for the best patient care possible. EMS providers have information that is important to the overall care of the patient. This information must be presented in a concise fashion at time of patient care transfer. The MIST mnemonic is an example of how information can be successfully exchanged at patient hand offs.

- M** Age/Sex, **M**echanism of Injury or **M**edical Complaint
(If known include patient's name)

- I** Injuries or Inspections
(Time of injury/list injuries head to toe or time of onset/brief medical exam findings)

- S** Vital Signs
(First set and significant changes, include glucose)

- T** Treatments and response
(Interventions, medications given, and patient response)

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1.6 CRIME SCENE MANAGEMENT

It is clearly understood that the first and foremost duty of all personnel (law enforcement and EMS) is to protect and preserve human life. Pre-hospital providers must ensure that patient care is given the highest priority. In addition, and to the extent possible, this care should be given with consideration to the needs of law enforcement with respect to personnel safety, crime scene management and preservation of evidence. Pre-hospital personnel shall follow the direction of law enforcement with respect to crime scene management. The direction should not prevent nor detract from quality care. The following guidelines should be followed:

- I. Park EMS vehicles with consideration of the crime scene
 - Do not run over shell casings
 - Do not destroy evidence such as tire tracks, foot prints, or broken glass
- II. Consider wearing gloves for all activities at a crime scene including those not directly involved with patient care.
- III. Entry to the crime scene should be made with the minimum number of personnel necessary to access and provide care to the patient(s).
 - Do not send in multiple BLS first responders, ALS first responders and ambulance crew if it is likely to be a presumption of death
- IV. Entry to and exit from the crime scene should be accomplished by the same route.
 - Do not walk through fluids (blood) on the floor/ground
- V. Care should be taken not to disturb any physical evidence. (Physical evidence can be as small as a single hair)
- VI. Do not move or touch anything unless it is necessary to do so for patient care.
 - Observe and document any items moved
 - Notify law enforcement of, and document, any items removed from the scene (impaled object, bottles, and patient belongings)
 - Weapons should not be moved unless they pose an immediate threat
- VII. 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.
 - Do not cut through bullet holes or knife holes

- VIII. Clothing and all personal articles of the patient are to be left in the possession of law enforcement personnel whenever possible. Do not discard anything. If law enforcement is not immediately available to take possession of evidence or articles, place in paper bag and maintain in your possession to prevent any contamination of evidence. Law enforcement will take possession of evidence as soon as possible. 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.
- IX. 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 because evidence may be destroyed. On-scene law enforcement personnel may suggest a site to be used for trash which would be most ideal to maximize preservation of evidence.
- X. Do not clean or disturb a patient’s hands when involved with a firearm. Consider covering the patient’s hands with a paper bag during treatment and transport.
- XI. Patients who meet the “obvious death” criteria do not require EKG confirmation of asystole, or any manipulation of the body. These include:
- rigor mortis
 - dependent lividity
 - decomposition
 - decapitation
 - incineration
 - transected torso

Note: A single person can rapidly assess for pulse and respirations.

- XII. 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.
- XIII. Medical direction should be contacted in the event that a coroner, medical examiner, deputy coroner, deputy 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 presuming death. Law enforcement has been trained in obvious death criteria.

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.

- XIV. 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 superior for follow-up and/or action. If the disagreement involves, in the opinion of the pre-hospital 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 direct medical oversight advice.
- XV. In the event that EMS personnel discover a 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 assure their own safety and if possible, attempt to follow the guidelines contained in this document.
- XVI. Laundering of the scene at the completion of the investigation is not routinely in the scope of responsibility for the EMS or fire agencies and therefore these requests should be referred to the appropriate resources for completion of scene management.
- XVII. It is the suggestion of the County District Attorney's Office that all victims of a sexual assault be Examined by a certified Sexual Assault Nurse Examiner(SANE).
1. Paramedics who respond to a call for an alleged sexual assault victim should do a medical screening exam to determine any physical trauma that needs immediate attention. Treat appropriately. The paramedic should examine the genitalia only if severe injury is present or suspected.
 2. Inform the patient that this is the recommendation of the doctors and the District Attorney and secure permission. This must be an informed decision.
 3. When possible the paramedic should explain all procedures before initiating them.
 4. Patient history should be limited to the elements needed to provide emergency care.
 5. Be cognizant of preserving evidence during the process of patient assessment and care. This should include:
 - a. Cover cot with paper chux or sterile burn sheet
 - b. Handle clothing as little as possible
 - c. Do not clean wounds unless absolutely necessary
 - d. Do not allow the patient to drink or brush teeth
 - e. Ask the victim not to change clothes or bathe
 - f. Disturb the crime scene as little as possible.
 6. Contact Medical control and advise them of patient condition/injuries. Medical Control will advise to appropriate receiving facility.

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7. If the patient is stable, it may be necessary to inform your Fire Department Officer that you will be transporting the patient to a SANE facility. Document that the reason for transfer is for a SANE exam. Communicate with any police officers on scene that you will be going to the appropriate SANE facility, especially if the alleged victim is a child.
8. Contact the SANE facility as soon as possible and inform them that you are transporting a sexual assault victim.

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1.8 RESPONDER ENVIRONMENTAL REHABILITATION

This policy was developed to be used as desired by agencies under Mercy Medical Direction. It is written using NFPA 1584 and the FEMA Document as a guideline, with additional health and medical care guidelines that have since become understood. 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.

DETERMINING NEED FOR REHABILITATION ON SCENE

Each incident is unique and the Incident Commander must immediately assess whether there may be a need for rehabilitation for firefighters, EMS, law enforcement, and other responders on-site. Any incident expected to last 3 hours or longer should have rehabilitation ordered. When heat, high humidity, deep standing water, or cold exposure is likely on scene, rehabilitation should generally be initiated as soon as possible with regards to onset of the incident.

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. As humidity and wind play important factors in cooling, it is not sufficient to make rehab deployment decisions based on temperature alone.

Indications for immediate rehabilitation at a working fire scene:

- Heat stress index greater than 89 degrees if turnout gear or protective equipment and any exertion is anticipated
- Any heat stress index over 105
- Remember that direct sunlight and turnout gear add significant temperature stress
- Waist or deeper water is in operations area where personnel may need to stand or work
- Wind chill under 10 degrees or actual temperature below Zero Degrees

CREW REQUIREMENTS FOR REHABILITATION

Once the Incident Command determines that scene rehabilitation is warranted and it is operational, it is then mandatory that all personnel on scene follow rehab guidelines. It should never be left to individual discretion whether they need rehab or not. This has been shown time and again to be a dangerous behavior. While any personnel should be permitted to report to rehab at any time they feel they need it, they must report at specific intervals to be evaluated, hydrated, and obtain adequate cooling/warming, and rest. Reporting intervals shall be defined under normal and extreme operating conditions. Extreme conditions shall be defined as heat stress index greater than 105, temperature or wind chill at zero or below.

If at any time, a crewmember feels the need for rehab it should be provided as soon as possible. Crews should rehab together. High pressure SCBA will give crews more work time. Crews should be sent to rehab based on decreased work capability and fatigue, not only when their air tank is empty. These criteria are considered maximums, and crews should routinely be sent to rehab prior to reaching these maximums.

Normal operations- 30 minutes in turnout gear with SCBA
 40 minutes in turnout gear, if no SCBA used
 20 minutes of very strenuous work, even if no turnouts or SCBA used

Extreme operations- 20 minutes in turnout gear with SCBA
 30 minutes in turnout gear, if no SCBA used
 15 minutes of very strenuous work, even if no turnouts or SCBA used

(Ballistic and Chemical protective apparel is an extreme operation and frequent rehab is also needed.)

REHAB UNIT CONFIGURATION

- Distance from working scene enough to allow turn out gear and SCBA to be removed
- Appropriate shelter from conditions
- This may require warm vehicle or building or simple tent
- Fans and portable heaters as needed
- Must be free of smoke and apparatus exhaust
- Size must be large enough for anticipated use
- A clear entry and exit site must be established
- Easy and clear access for emergency ambulances must exist
- Should be staffed with dedicated medical personnel of highest level available
- The Rehab Chief Officer must have final say as to disposition of individuals in the unit

ROLE OF THE REHABILITATION UNIT DURING OPERATIONS

- Medical assessment on arrival- mental status, temperature, and manual vitals
- Rest, hydrate, normalize body temperature, and eliminate exposure stress
- Monitor those who meet observation parameters in designated treatment area
- Treat acute injuries; arrange transport when needed in designated treatment area
- Clear personnel to return to staging area for assignment

MEDICAL ASSESSMENT

On arrival obtain quick mental status, manual vitals, and oral temperature or axillary temperature (oral most accurate). Goal is under 100.6

Obtain pulse and BP. Pulse over 130 signifies trouble. BP above 150 systolic or 110 diastolic should be further evaluated

Blood Pressure Guidelines:

BP < 140 systolic and < 90 diastolic meet criteria for discharge

BP 140-160 systolic and 90-100 diastolic are discharged but told to follow-up with their physician for repeat BP measurement

BP > 160 but < 180 systolic and BP > 100 but < 120 diastolic are placed on light duty and removed from active operations on the scene. They must bring a fitness for duty note from their primary physician stating that the BP has been addressed prior to returning to duty

BP > 180 systolic or > 120 diastolic requires transport to the ED for evaluation

Vomiting, light-headedness, extreme pale skin color, profound nausea indicates serious heat exposure. These individuals should be moved to a treatment area and likely cannot return to action

Individuals who meet all parameters of assessment can move to rest, hydration area

Individuals with abnormal vital signs or findings shall be moved to a treatment area

REST AND RE-HYDRATION

Those personnel who are assessed to have acceptable parameters on arrival to rehabilitation unit should be moved to rest area. Here, they should cool their arms, palms of hands, soles of feet for 10 minutes if hot. Fluids orally should be partially water and partially a commercially made sports drink such as Power-aid or G2 for electrolyte replacement. Fluids should be on ice so they have a temperature close to 40 degrees. Gear should come off in hot operations with nothing on the head. Minimal time of rest is 10 minutes. If individual feels well, check pulse. If the pulse is under 110, may release to duty. If pulse is above 110, check temperature. Continue rest, cooling and hydration. Once temperature is under 100.6 and pulse is under 110, individual may be released.

Similarly in a cold environment, responders will need a warming process during rehab operations. Warm beverages, warm environment, and warming packs to the palms of hands and soles of feet have been shown to assist in warming. Removal of wet clothing and monitoring for mental status changes and early signs of hypothermia is also important.

Rest and rehab times shall be mandatory 10 minutes, and can be as long as deemed necessary by rehab commander. Personnel engaged utilizing SCBA greater than 45 minutes, wearing encapsulated protective equipment, doing 40 minutes of intense work, or working in extreme conditions should have 20 minutes of rehab time. When operations are expected to last over 3 hours, food should be made available. Food should be high energy snacks, bananas and fruit. Do not use caffeine, fatty foods or salty food until conclusion of event. Warm drinks without caffeine are mandatory in cold operation situations.

ON SCENE MEDICAL TREATMENT

Anyone symptomatic will be treated based on symptoms, not on CO level interpretation. Those with temperature or vital sign abnormalities are likely to have heat related illness. Follow EMS Guidelines for treatment. If they recover quickly and symptoms are mild, return to duty is possible. Use same parameters as above. Many will be restricted from return to duty. Medical Officer will determine safety of person returning to duty and will also determine if transport to the hospital is needed.

Burns, injuries, heat related emergencies shall be treated according to established EMS Guidelines. Working fires with ALS support should have at least one Cyano-Kit available on scene.

TRANSPORTATION TO HOSPITAL

If the patient shows signs or symptoms of:

- Persistent abnormal vital signs despite adequate rehabilitation times
- Shortness of breath that does not clear with 10 minutes rest or requires a breathing treatment
- 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 rehab/medical officer

If ALS is available, IV's should be used to re-hydrate those who are symptomatic. Anyone requiring IV fluids must be transported to hospital

REFUSAL OF REHAB CARE OR TRANSPORTATION TO HOSPITAL

If the department member refuses medical care or transportation, they will be required to sign a medical release waiver. The most Senior Fire Official/Incident Commander on scene should be made immediately aware of this situation, and the member must leave the scene. The department member should be encouraged to seek medical care. Online medical direction can be consulted immediately for any health concerns.

DEBRIEFING

All rehab operations should have a full de-briefing within 24 hours per Department Policies.

Date _____	Rehab Tracking Form	Start Time _____ End Time _____	
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Address _____	Incident # _____
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Name	Team #	Dept	Time In	B/P	Pulse	Resp	SpO2/CO	Temp	Time out
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1.10 USE OF LIGHTS AND SIREN

The use of lights and sirens should be reduced as much as possible and only reserved for emergency response and 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.

Each organization should develop and regularly review an emergent driving policy that provides for and enforces safe practices by all drivers. This policy should include a system to monitor the use of lights and siren.

Each organization should provide structured, emergent vehicle operation training prior to allowing personnel to drive the ambulance. Before privileges are granted, drivers should be observed by their supervisors or squad leadership.

Lastly, every possible effort should be taken to reduce the use of lights and siren. All responders have the ability to communicate with one another, and after assessing the patient, they have the ability to downgrade the response. When transporting the patient to the hospital, it is much easier to downgrade the transport. A thorough patient assessment has been completed with stabilizing care being provided.

Drivers should always come to a complete stop before entering an intersection where you do not already have the right-of-way. Driving with due regard for public safety is a critical and expected practice for agencies under our medical direction.

1.12 PARAMEDIC INTERCEPTS

This advanced level of care is readily available throughout our area. Paramedic response should be requested as soon as possible to ensure the patient receives the maximum benefit from the Paramedic provider. Immediate life threat calls should have Paramedic response initiated by dispatch, regardless of whether or not EMD is utilized. Agencies must work with their dispatch centers to ensure this process occurs prior to the incident. These call types at a minimum include:

- Cardiac Arrest with CPR indicated
- Trauma with altered mental status
- Trauma with severe hemorrhage
- Penetrating trauma to head, neck, or torso

The following type of calls may also benefit from rapid Paramedic response based on EMD or agency request:

- Cardiac Arrest
- Unresponsiveness
- Cardiac Chest Pain or STEMI
- Difficulty Breathing
- Anaphylaxis
- Severe Pain
- Major Burns
- Major Trauma
- Drowning or Near Drowning
- Drug Overdose
- Severe Hypothermia
- Multiple or Ongoing Seizures
- Abnormal vital signs(severe hyper/hypotension, brady/tachycardia)

Once dispatched, ALS should initiate contact with requesting agency and give an ETA. Additional communications should occur to give patient updates, and routes of travel if transport is initiated prior to ALS arrival. Direct radio communications will 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 advanced care is questioned, it would be prudent to downgrade the ALS response while further patient assessment is accomplished. If after a thorough assessment, it is determined that ALS care is not needed, then ALS can be cancelled. It is encouraged for our agencies to utilize the responding ALS crew or medical control to assist with assessment questions. All downgrades/cancellations need to be documented and will be reviewed by the medical director. Cancellation of EMD activated ALS can only be made after an on scene assessment of the patient by an EMS provider.

This page updated 1/10/22

1.14 HEMS GUIDELINES

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 emergenciesⁱ in reaching hospitals that can provide interventions IF the patient can be delivered during an interventional windowⁱⁱ AND Ground Emergency Medical Services (GEMS) are not able to appropriately deliver the patient to definitive care within that interventional window.

Examples include:

- Injured patients meeting Field Trauma Triage Guidelines that are greater than 30 minutes ground travel to the closest ACS verified Level I or Level II trauma center.
 - HEMS utilization for mechanism of injury or special population alone (Category 4 or 5) lacks clear evidence of benefit. Since these are patients that may not necessarily need the resources of the highest trauma level in a region, use of HEMS should be carefully considered. Standing guidelines or on-line medical consultation may offer individual guidance.
- Patients with acute STEMI needing transportation to a regional PCI capable hospital where ground transportation exceeds an interventional window.
- HEMS may provide clinical resources to patients needing critical care services if unable to obtain critical care services by GEMS (E.g. inter-facility transfer).
- HEMS may provide a mode of transport for geographically isolated, remote patients independent of medical urgency (E.g. Island) although this mode should be carefully considered.
- HEMS may provide a resource to local GEMS systems during disasters and times of low community resources.
- HEMS have unique risks of transport including economic.
- Hospital destination and mode of transport are two separate and distinct clinical issues.
- 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 stroke.

ii An interventional window can be defined as the period of time from 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 drop off after 60 minutes.

1.16 DESTINATION DETERMINATION

Purpose:

It is the purpose of this policy to provide guidelines for determining the appropriate transport destination for every patient.

Procedure:

Patient should be transported to the closest, most appropriate hospital, utilizing the most appropriate level of care. Air medical should only be utilized when ground transport would not provide the same level of care, or timeliness in transporting the patient. With transport times of less than 30 minutes, ground transport is typically a more rapid means of transport.

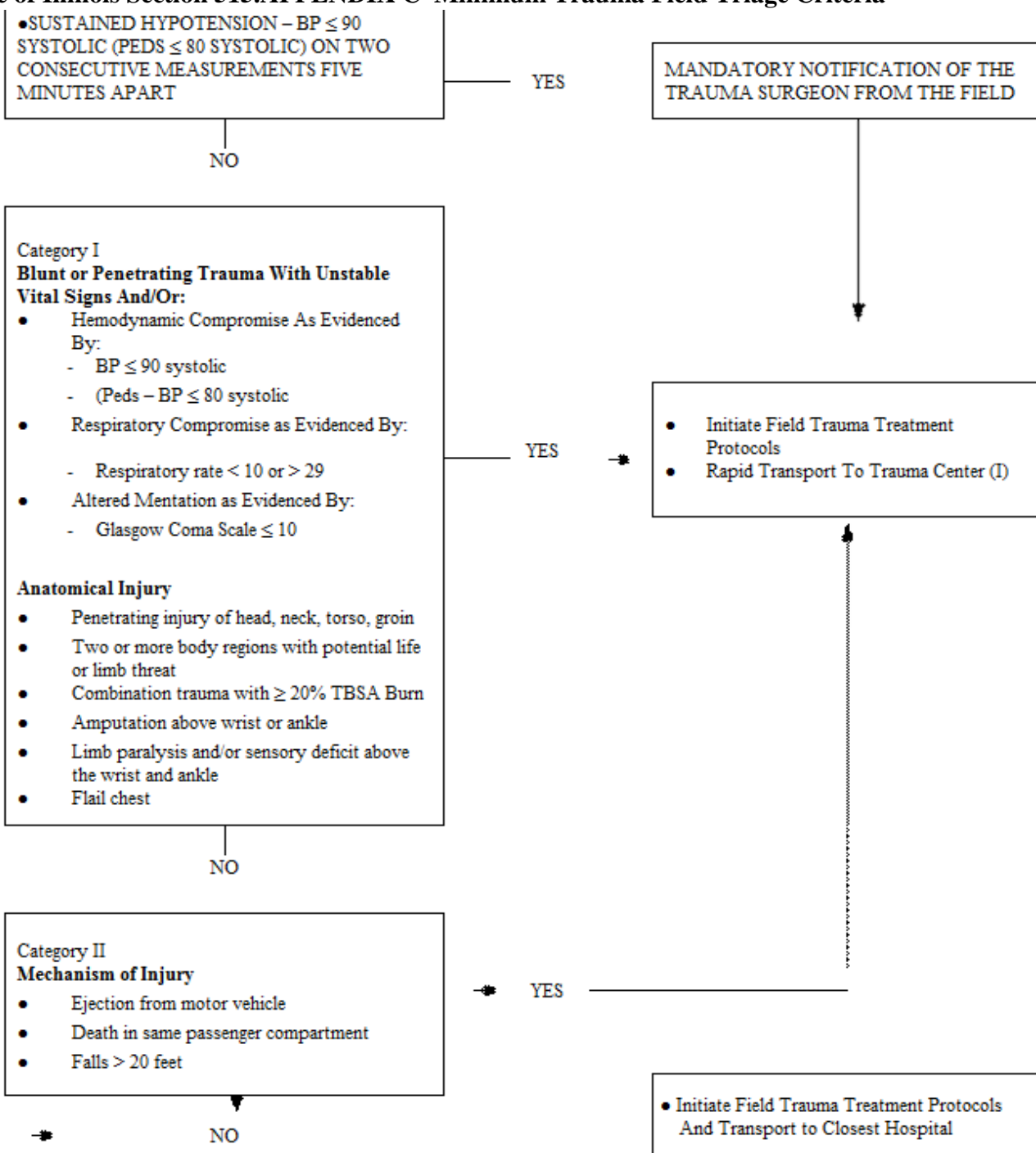
Appropriateness is determined by:

- Patient preference¹
- Specialty needs of the patient:
 - Burns (Severe)
 - Critical Pediatric
 - PNB (Cath Lab/Therapeutic Hypothermia)
 - STEMI
 - Stroke
 - Trauma
- Hospital's capacity to meet these needs
- Medical direction
- Hospital diversion status
- Patients medical home
- Weather

This page updated 1/10/22

¹ The patient has the right to make the ultimate decision on hospital destination as long as it is operationally available to the EMS service (a hospital the service would normally be allowed to transport to, that is not on diversion). If patient assessment dictates the patient should go to a different hospital than their original choice, but the patient is able to make decisions and wants to go another facility, attempt to quickly educate the patient regarding the reasons to go to the alternate facility. Transport per patient final request.

State of Illinois Section 515.APPENDIX C Minimum Trauma Field Triage Criteria



- (1) > 25 minutes from Trauma Center, transport to nearest participating trauma hospital.
- > 30 minutes from Trauma Center or participating trauma hospital, transport to nearest hospital.
- > 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.

1.18 STATEMENT OF RELEASE

- I. An official Statement of Release (SOR) must be obtained from any patient with whom the EMT makes verbal or physical contact who later decides against transport to the hospital. EMT may not sign off a patient and must have an EMT sign off the patient if any acute medical condition, deterioration from previous known health status, or likelihood of injury (e.g. lift assists on anticoagulants). As general guidelines, the following are situations where a SOR should be obtained. If a patient refuses treatment or transport and:
 - A. The mechanism of injury suggests medical attention needed.
 - B. Any form of treatment has already been rendered.
 - C. The patient has an obvious illness or injury, which appears to require medical evaluation and/or treatment.
 - D. Pediatric (age 18 or less) vital signs are outside of age appropriate ranges.

- II. **NEVER ADVISE AGAINST SEEKING MEDICAL ATTENTION!**

- III. Patients must sign a SOR form in front of a witness, in the following order of preference.
 - A. Police Officer
 - B. Family Member
 - C. Crew Member

- IV. Prior to signing
 - A. Attempt to obtain a set of vital signs.
 - B. Possible risks and consequences of refusing further treatment or transport must have been fully explained to the person by the EMT or on-line/on-scene medical direction.
 - C. The person must be deemed to have capacity to refuse care.
 - D. Specific documentation of these must be done on the run form and the run form attached to the signed and witnessed refusal form.

- V. When a patient is deemed to lack capacity and refuses care, law enforcement involvement and evaluation must be obtained. Ensuring the safety of EMS personnel is of paramount importance. 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 superior for follow-up and/or action. If the disagreement involves, in the opinion of the pre-hospital 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 direct medical oversight advice.

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V.

- A. Such situations include:
1. If the patient is a danger to self or others
 2. If the patient has altered thought processes
 3. If you suspect alcohol or other drug intoxication (not simply alcohol or drug use)
 4. All patients with suicide gestures or attempts.
 5. Any minor with self-injurious behavior
- B. Persons under the age of 18 (minors) are to be treated as pediatric patients and cannot be considered legally capable and therefore, cannot refuse care; they should be transported when possible. Exceptions include minors who are
1. Married
 2. In the armed forces
 3. Having a pregnancy related emergency
 4. Parent refuses care by phone (witnessed)
- C. With the exception of school bus(1.28), highway incidents(1.18 VII), and incidents with parents on scene, all minors(age less than 18) require a full patient care report.

VI. **Medical Control must be contacted** and informed of the patient's refusal in all situations when there has been patient contact and obvious injury is noted.

VII. In high risk interstate highway responses or MCI, the statement of release must be prioritized against life safety issues. If victims of these incidents are claiming no injuries, have minimal mechanism for injury, and are not obviously injured, name and contact information should be recorded in lieu of a full statement of release to expedite clearing the scene. Records will be maintained in secure manner in accordance with department policy. Law enforcement or EMR from your agency may cancel an EMS response if individuals appear uninjured, are claiming no injuries, and refusing EMS care. If EMS chooses to continue response to further evaluate, a non-emergent response is acceptable. Any roadway response should be conducted in accordance with Traffic Incident Management guidelines and coordinated with law enforcement to provide maximum safety to EMS responders, patients, victims, and bystanders.

This page updated 1/10/22

1.20 PHYSICIAN INTERVENER(ON-SCENE PHYSICIAN)

Introduction:

The EMS Medical Director and/or the on-line medical control physician are ordinarily responsible for patient care in the field. Occasionally, a physician will be present on the scene of a call, which may cause confusion, uneasiness, and medical/legal considerations. Two scenarios are potentially possible in this setting:

1. The physician who knows the patient and has established a formal doctor-patient relationship.
2. The physician who does **not** know the patient.
 - Both scenarios present with different physician responsibilities.
 - Cooperation and communication are essential.
 - Pre-hospital providers should recognize and acknowledge the expertise of other medical professionals (RN, LPN, Nurse Practitioner, Respiratory Therapist, Physician Assistant, etc.) and use them as needed for the best outcome of the patient.

The Physician with an Established Doctor-Patient Relationship:

1. EMS personnel will assess and manage the patient upon arrival at the scene regardless of on-scene physician direction. This applies to a physician's private office or clinic.
2. Should the on-scene physician wish to assume control of patient management, he or she may do so. If the EMT is uncomfortable with any specified treatment or management, the following **must** be satisfied:
 - A. **Communication established between the medical control physician and the on-scene physician.**
 - B. The on-scene physician agrees to accompany the patient in the ambulance to the hospital.
3. In the event that the intervener (on-scene) physician agrees to assume control and the above two criteria are satisfied, then the following medical/legal details must be adhered to:
 - A. Orders given by the on-scene physician may be carried out by the EMS crew, provided that they are part of the provider's level of training. Orders that are not must be done by the intervener physician.
 - B. If the EMT feels uncomfortable about any aspect of patient care in the field, he or she should **contact medical control** and communicate those concerns. The on-line medical control physician has the authority to supersede any or all of the orders given by the intervener physician at any time during the pre-hospital phase.

The Physician Without an Established Doctor-Patient Relationship:

1. EMS personnel will assess and manage the patient upon arrival at the scene regardless of on-scene physician direction.
2. If the physician on scene agrees to assume care of further patient management, **ALL** of the following must be satisfied and told to the intervener physician:
 - A. 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 he or she wishes to assist with patient care.
 - B. Physician must accompany the patient to the hospital in the ambulance. An intervener physician who elects not to accompany the patient to the hospital will immediately and automatically relinquish control to the on-line medical control physician.
 - C. Physician must carry out all orders that are **not** part of the pre-hospital providers training.
 - D. Physician must provide license information for the run report and sign all orders given on the EMS run sheet.
 - E. 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.
 - F. The medical control physician may supersede the on-scene physician at any time during the pre-hospital phase.

Special Situations:

- In the event of a mass casualty incident (MCI), an on-scene physician may be best utilized at the scene and not accompany a patient to the hospital.
- 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 on-line medical control.
- Orders communicated for patients undergoing inter-facility transport should be followed as long as those orders are within the EMTs scope of practice. If possible, the transferring physician should sign those orders.

Non-Physician Medical Personnel on the Scene:

- If a bystander at an emergency scene identifies himself or herself as a health care provider other than a physician, the EMS provider should:
 1. 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.

1.22 DO NOT RESUSCITATE (D.N.R) ORDERS

Mercyhealth System supports the concept of DNR orders, POLST, Advanced Directives, or other state approved pre-determined patient care processes. Patient rights regarding these decisions should be respected whenever possible.

Documentation is mandatory for the EMS provider to withhold ACLS measures. This must be in one of the following forms:

1. A state form properly filled out.

If such documentation is not available, but circumstances or individuals at the scene indicate the patient may be a DNR patient:

- > Initiate ACLS measures and immediately contact Medical control for clarification and direction.
- > The Medical control physician **may** give “No Code” order

If family members disagree with a valid DNR status:

Contact Medical control who will explain to those individuals that the patients DNR status legally cannot be over-ridden by their wishes

A patient or their legal representative(healthcare agent, legal guardian, or power of attorney) may revoke their DNR status at any time, the paramedic is obligated to honor that request. If the patient then becomes PNB(pulseless not breathing), full ACLS resuscitative efforts are then necessary.

Where no DNR status exists, full ACLS measures should be undertaken. “No Code” status in no way releases a paramedic from comfort and transport measures.

This page updated 3/22/18

1.24 TERMINATION OF RESUSCITATION IN THE FIELD

Guidelines:

Most pulseless non-breathing patients should have full resuscitative efforts, consist of CPR, defibrillation when applicable, Advanced Life Support response, and transport to the hospital. There are a few exceptions to this policy, in which resuscitation can be waived or terminated:

EMTs shall not waive (except as listed in bold below) or cease resuscitation without a direct order from a Medical Control Physician, the patient's personal physician, or other recognized physician. The ordering physician assumes responsibility for this order.

Upon order from a physician as described above, resuscitation attempts shall be waived (or discontinued if started) in any of the following situations:

- > **A patient with obvious signs of death such as rigor mortis, dependent lividity, decomposition, decapitation, incineration, or transected torso are the only situations that EMTs can waive resuscitation. All other situations require ALS response and physician medical direction.**
- > The patient's personal physician is available in person or by telephone, and personally directs the rescuers not to resuscitate based upon his/her knowledge of the patient's medical condition and patient wishes.
- > The patient has valid paperwork or **DNR** that clearly states a desire not to have CPR or any other resuscitative measure done in the event of a cardiac event
- > The patient has an unwitnessed cardiac arrest, is in asystole, and no bystander CPR has been started. (This does not apply if exposure hypothermia, drowning, or drug overdose plays a role in the arrest).
- > The patient has cardiac arrest due to severe blunt trauma, has no signs of life, is in asystole, and doesn't respond to patient's injury appropriate ALS interventions(ex. advanced airway, bilateral needle decompression, pericardiocentesis, fluid bolus, and ACLS medications).
- > Other conditions as determined by the Medical Control Physician.

Procedures:

- > Upon arrival at the scene of a patient in cardiac arrest, the crew should begin CPR and attach the cardiac monitor. (This is not necessary in the case of obvious death such as rigor mortis, dependent lividity, decomposition, or transected torso).
- > Determine if asystole is present in two leads on the cardiac monitor. Obtain history from the family or bystanders.
- > Contact Medical Control. 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.
- > If resuscitative efforts are ceased notify the law enforcement center and/or the Coroner. Remain at the scene until relieved by a law enforcement officer or the Coroner.
- > 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.
- > Provide support to family members as needed until law enforcement or others can assume this role.
- > If transport has been initiated, continue transport to the Emergency Room, and follow Medical Control direction to stop resuscitative efforts.
- > Submit written documents and recordings to Medical Control.

1.26 RESCUE TASK FORCE

Rescue Task Force

Rescue Task Force (RTF) initial and ongoing training for all EMS providers should include Tactical Emergency Casualty Care (TECC) concepts and practical skills applications. EMS providers must have a clear policy and understanding with their respective law enforcement agencies. All EMS Providers should understand the concept of RTF and routinely train with their respective law enforcement agencies. The RTF is not a replacement for a qualified TEMS element. Adequate security and protective forces must be assigned to any EMS provider operating under a Rescue Task Force model. Participation in the RTF is potentially high risk, EMS providers opting out of this type of response must notify their respective department's leadership, preferably well in advance of any incident response.

Tactical Emergency Casualty Care

The TECC guidelines are the civilian counterpart to the US military's Tactical Combat Casualty Care (TCCC) guidelines. The TECC guidelines take into account the specific needs of civilian EMS providers serving civilian populations. The TCCC guidelines were developed for military personnel who deploy in support of combat operations. These guidelines have proven extraordinarily successful, and provide the foundations for TECC.

The specifics of casualty care in the tactical setting will depend on the tactical situation, the injuries sustained by the casualty, the knowledge and skills of the first responder, and the medical equipment at hand. TECC focuses primarily on the intrinsic tactical variables of penetrating trauma compounded by prolonged evacuation times. The principle mandate of TECC is the critical execution of the right interventions at the right time. Indirect Threat Care is rendered once the casualty is no longer under fire (i.e. warm zone).

Medical equipment is limited to that carried into the field by RTF personnel typically including tourniquets, large trauma dressings, adjunct airways, triage tape/tags, and rapid extraction equipment.

Reference:

http://www.iaff.org/Comm/PDFs/IAFF_RTFF_Training_Position_Statement.pdf

1.28 SCHOOL BUS INCIDENTS

OVERVIEW

This policy was developed to assist in responding to handling of school bus incidents involving the presence of minors (patients 18 years of age or younger). 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 provider 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. These procedures should be developed with the joint input of each provider's legal counsel, school officials, and parents. 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 for more help needed

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 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 hospital. If Medical Control 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.

The provider 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.

Once the decision to implement the uninjured children procedure is approved by medical direction, it is the responsibility of the local 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 Statement of Release protocol.

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

Mercyhealth System
Medical Guidelines
2.0 AGITATED & COMBATIVE

Note:

- Ensuring the safety of EMS personnel is of paramount importance. Always summon law enforcement to secure the scene and patient before attempting to provide medical care.
- Physical restraints are only permitted when the patient is potentially dangerous to self or others.
- Never apply physical restraints for punitive reasons, or in a manner that restricts breathing and circulation, or in places that restrict access for monitoring the patient.
- Behavioral disturbances are often the result of underlying medical conditions that require immediate medical attention, including head trauma, alcohol or drug intoxication, metabolic disease, and psychiatric disorders. Patients in need of medical attention must be transported in an ambulance, not a police vehicle.
- EMS personnel are not trained in law enforcement restraint techniques. If law enforcement restrains the patient with handcuffs, an officer with a key must accompany the patient during transport.
- Patients most at-risk of dying in police custody are those who violently resist and struggle against restraints.
- Continued patient struggling can lead to hyperkalemia, rhabdomyolysis, and cardiac arrest.

Priorities	Assessment Findings
Chief Complaint	"Behavioral Disturbance"; "Violent behavior";
OPQRST	Determine onset, duration and progression, triggering events, perception of severity by bystanders,
Associated Symptoms/ Pertinent Negatives	Alcohol or drug intoxication, Head trauma
SAMPLE	Psychiatric medications? Noncompliance? History of schizophrenia or bipolar disorder? History of drug or alcohol abuse?
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	General Appearance: Bizarre behavior, violent, aggressive, combative, loud, obnoxious, agitated; partial or complete undressing? Uncooperative (Does not respond to verbal commands to desist)? Skin: Diaphoresis? Cool, moist and pale? Warm, dry and flushed? Respiratory Effort: Labored breathing? Heavy breathing? Lung Sounds: Wheezes, rales, rhonchi or stridor? Decreased lung sounds? Cardiovascular: Hypertensive and tachycardic? Extremities: Trauma? Neuro: Excited, agitated, increased activity and increased intensity of activity Psych: Bizarre thoughts and actions; Paranoia, delusional, confused, clouded consciousness?
Data	SpO ₂ in all patients and ETCO ₂ when able(continuous or frequent re-checks); 12-Lead EKG as soon as it becomes practical to obtain one; Blood Glucose to rule out hypoglycemia as a cause of the behavioral disturbance.
Goals of Therapy	Physically or chemically restrain the patient to reduce the threat to self and others, especially emergency responders (law enforcement and EMS)
Monitoring	BP, HR, RR, EKG, EtCO ₂ , SpO ₂ .

EMERGENCY MEDICAL RESPONDER/EMT

- Scene size-up, do not approach an agitated and combative patient before law enforcement has gained control of the situation
- It is reasonable to attempt verbal de-escalation, but do not persist if it appears to be futile or making the situation worse
- First responders are not allowed to physically restrain a patient, but they are not prohibited from providing medical care to a patient who has been restrained by law enforcement
- Initiate Routine Medical Care once it is safe and practical
- Consider physical restraints [1] as a last resort when verbal control is 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
- No hog-tying or hobble restraints allowed. No “sandwiching” with long boards or scoop stretchers
- Once restrained, the patient must be brought to a sitting position or the recovery (lateral recumbent) position
- Do not keep the patient in a prone position once restrained
- If EMS or law enforcement personnel must “pile on” to gain control, they must get off the patient as quickly as possible to permit the patient to breathe
- If spitting, a spit net or surgical mask may be applied to the patient

PARAMEDIC

- Do not attempt to initiate an IV until the patient becomes cooperative
- IV 0.9% NS @ KVO
- If signs of hyperthermia or hypovolemia are present, administer normal saline wide open, verifying clear lung sounds and vitals every 500ml
- Consider a second IV
- For safety of responders and or patient that is actively violent or aggressive, consider disassociating with **Ketamine** 2 mg/kg IV/IO (max dose 200mg) or 4 mg/kg IM (max dose 400mg). May repeat x1 in 5 minutes if no effect.
- Consider **Versed** 0.1mg/kg IV/IO/IN(max 5mg bolus) or 0.2mg/kg IM(max 10mg bolus) to calm mild agitation, be cautious of paradoxical effect
- Obtain a 12-Lead EKG, if able
- Monitor vital signs every 5 minutes including continuous etCO₂ and SpO₂

FOOTNOTES:

[1] Mandatory Physical Restraint Documentation

- Document alternative options explored 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
- Evidence that distal neurovascular function was not impaired by the restraints
- The position of the patient after restraints were applied
- Medication(s) used and their effects, including adverse effects

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Medical Guidelines

2.2 ALLERGY & ANAPHYLAXIS

Note:

- Allergic reactions span a continuum from minor to life threatening [1]
- If due to a bee sting, remove stinger by scraping horizontally with tongue depressor or plastic card. Do not squeeze the venom sac
- If anaphylactic shock is present, treat for shock and maintain warmth
- Gather all medications and take them to the ED
- Angioedema with significant swelling of the tongue increases the risk of obstructed airway but also makes RSA technically more difficult and therefore relatively contraindicated. Institute emergent transport and prepare the ED for emergency intubation procedures. In Angioedema, Benadryl and Epinephrine may be given, but are not likely to help
- In patients with underlying coronary artery disease, or those at risk for it, epinephrine should be used with caution, because of the risk of inducing a myocardial infarction. In moderate to severe allergy and anaphylaxis, there is no contraindication to epinephrine

Priorities	Assessment Findings
Chief Complaint	"Allergic Reaction", "Hives" "Itching Rash"
OPQRST	What provoked the reaction? Did the patient take diphenhydramine (Benadryl) or use an epinephrine auto-injector (Epinephrine auto injector), and how did they respond?
Associated Symptoms/ Pertinent Negatives	Subjective swelling of facial, oral or pharyngeal structures, difficulty breathing, wheezing and light-headedness, flushed in face.
SAMPLE	Does the patient have any environmental, medication, food or other allergies? Is the patient taking an antibiotic? If the patient has Angioedema, is he/she taking an ACE inhibitor? Is he/she taking a Beta Blocker? If the patient is taking a Beta Blocker, he/she might not respond to epinephrine.
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General: Identify degree of severity: mild moderate or severe [1]. Skin: Urticaria (hives) HEENT: Swelling of the lips, tongue or pharynx (Angioedema) Chest: Use of accessory muscles of respiration, labored breathing Lungs: Wheezing Cardiovascular: Hypotension, tachycardia (anaphylactic shock) Neurological: ALOC
Data	EtCO ₂ , SpO ₂ , 12-Lead ECG
Goals of Therapy	Reverse the allergic reaction, relieve bronchospasm, correct hypotension/shock
Monitoring	Vital signs and cardiac monitoring.

EMERGENCY MEDICAL RESPONDER

- If altered level of consciousness or no radial pulse, position patient supine with legs raised
- **EPI-Pen(>66lbs/30kg)** IM (0.3mg) or **EPI-Pen Jr(<66lbs/30kg)** IM (0.15mg) to lateral mid-thigh for moderate or severe reactions). Hold in place for 10 seconds and massage area for 10 seconds after injection.
- Oxygen 10-15 LPM by non-rebreather mask
- Alternative medical director approved epinephrine auto injectors may also be used.
- Assist with patient-prescribed medications
 - **Albuterol Sulfate** MDI 6 Puffs
- Nebulizer Therapy: If wheezing
 - **Albuterol Sulfate** Unit Dose (2.5 mg in 3 ml) administer per hand held nebulizer or mask; May repeat X 2 additional doses

EMT

- Administer Nebulizer Therapy: **Albuterol Sulfate** 2.5mg in 3 ml with **Ipratropium Bromide (Atrovent)** 0.5mg in 2 ml administer per hand held 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 via HHN
- **Diphenhydramine (Benadryl)** 50 mg PO if greater than 50kg(peds dose liquid or chewable 1mg/kg max 50mg) for mild, moderate, or severe reactions
- **EPI-Pen(>66lbs/30kg)** IM (0.3mg) or **EPI-Pen Jr(<66lbs/30kg)** IM (0.15mg) to lateral mid-thigh for moderate or severe reactions). Hold in place for 10 seconds and massage area for 10 seconds after injection.
- Alternative medical director approved epinephrine auto injectors may also be used.
- Drawn up epinephrine and syringe using below dosing only for departments with additional training to do so.

PARAMEDIC

- Initiate IV/IO 0.9% NS @ KVO
- If the patient is Hypotensive, run wide open for 500ml after verifying lung sounds not wet
- If loss of consciousness or loss of gag reflex occurs, consider non-visualized airway or endotracheal intubation See *Respiratory Distress Guideline*
- **Epinephrine 1mg/1ml** 0.5 mg (peds 0.01mg/kg max 0.3mg) IM for moderate to severe reactions. Repeat every 10 – 15 minutes X3 if patient is not improving, or as ordered per Medical Control
- **Diphenhydramine (Benadryl)** 50 mg IM/IV/IO (peds 1mg/kg) for mild, moderate or severe reactions
- **Glucagon** 2 mg IV/IO/IM if the patient is taking Beta Blockers and is not responding to Epinephrine, repeat every 10 minutes, until you run out of glucagon
- **Methylprednisolone (Solu-Medrol)** 125 mg IV/IO/IM (peds 2mg/kg) for moderate to severe reactions
- **Push Dose Epinephrine per section 5.42**

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, hypotension is present and ALOC may occur

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2.4 ALTERED LEVEL OF CONSCIOUSNESS

Note:

- Consider reversible causes of ALOC: hypoglycemia, hypoxia, narcotic overdose, CO poisoning
- Other causes of ALOC include: Hypovolemia, shock, sepsis, head injury, drug or alcohol intoxication, toxic exposures, syncope, seizures, arrhythmias

Priorities	Assessment Findings
Chief Complaint	"Confused" "Unresponsive", Not acting themselves"
OPQRST	Determine onset and duration. Triggering events (e.g. Trauma)
Associated Symptoms/ Pertinent Negatives	Headache, Weakness, Slurred speech, Aphasia, Incontinent
SAMPLE	Medication consistent with possible causes. (E.g. Alzheimer's, CVA, Diabetes, Seizures,)
Initial Exam	Check ABC's and correct any immediate life threats
Detailed Focused Exam	Vitals: BP, HR, RR, Temp, SpO ₂ General Appearance: Unresponsive, pale, diaphoretic? Signs of trauma? HEENT: PERRL? Pupils constricted or dilated? Lungs: Wheezes, rales or rhonchi? Signs of respiratory distress or hypoventilation? Heart: Rate and rhythm? Signs of hypo-perfusion? Neuro: Unresponsive? Focal deficits (CVA)?
Data	Blood Glucose, SpO ₂ , EtCO ₂ , 12-Lead ECG
Goals of Therapy	Restore normal mental status, Maintain ABC's
Monitoring	Cardiac monitoring, repeat vitals

EMERGENCY MEDICAL RESPONDER/EMT

- Routine medical care
- Oxygen 2-4 LPM per nasal cannula to keep SpO₂ ≥ 94%; May give high-flow oxygen by non-rebreather mask
- Consider assisting ventilations with bag-valve-mask with high-flow oxygen
- Consider oropharyngeal airway or nasopharyngeal airway
- Consider non-visualized airway of appropriate size
- If a narcotic overdose is suspected, consider **Naloxone (Narcan)** 0.5mg up to 2mg IN or IM(EMT and above only) 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 patients respiratory effort. Refer to *Toxic Exposure/Overdose Guidelines*
- Check glucose level, if < 70, follow *Diabetic Emergencies Guideline*
- If neuro deficits, suspect stroke, refer to *Stroke Guidelines*

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PARAMEDIC

- IV 0.9% NS @ KVO
- If SBP < 90 mmHg and lung sounds are clear, initiate a fluid bolus of 500 ml Normal Saline
- If a narcotic overdose is suspected, consider **Naloxone (Narcan)** 0.5mg up to 2mg IV/ IN/ IO/IM 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 patients respiratory effort. Refer to *Toxic Exposure/Overdose Guidelines*
- Consider RSA. See *Respiratory Distress Guidelines*
- Suspected toxic overdose, refer to *Toxic Exposure/Overdose Guidelines*

Mercyhealth System
Medical Guidelines
2.6 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, but all COPD patients must be closely monitored for signs of respiratory depression due to oxygen therapy. Look for: somnolence, lethargy, decreased rate or depth of breaths. If these appear, back off on the rate of flow and prepare to assist ventilations.
- Patients with COPD are usually older adults with a long and heavy smoking history. This includes patients with emphysema (“pink puffers”) and chronic bronchitis (“blue bloaters”). Exacerbations are often triggered by infections.
- Asthma is usually a disease of childhood, but may occur or re-occur later in life. There is usually an identifiable trigger, like infection, weather changes or exposure to certain allergens (e.g., dogs, pollen, etc.). The so-called classic triad of dyspnea, cough and wheezing may not always be present.
- 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.

Priorities	Assessment Findings
Chief Complaint	Difficulty breathing or shortness of breath
OPQRST	Determine onset, duration and progression, triggering events, response to treatment at home, and subjective severity
Associated Symptoms/ Pertinent Negatives	Chest pain (angina or pleurisy), fever/chills, cough/productive of what, recent changes in sputum color
SAMPLE	Exposure to a known allergen. History of asthma, emphysema, chronic bronchitis, COPD or previous bronchospasm. Current or past medications for these problems (e.g., Albuterol, Atrovent, Advair, Prednisone, Antibiotics). Compliance with these medications recently.
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	General Appearance: Tripod positioning, purse-lipped breathing, nasal flaring in peds, age appropriate verbal response? Severity of distress [1]? Skin: Cool, moist and pale? Warm, dry and flushed? Urticaria? Cyanosis? Respiratory Effort: Using accessory muscles, signs of fatigue; two-word sentences? Lung Sounds: Wheezes, rales, rhonchi or strider? Decreased lung sounds? Prolonged expiratory phase? Absence of wheezing? Heart Sounds: Rate, regularity? Lower Extremities: Pitting edema, pale and mottled in peds? Neuro: ALOC, lethargy, somnolence?
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	Improve oxygenation and ventilation; reduce distress and work of breathing.
Monitoring	BP, HR, RR, EKG, SpO ₂ , EtCO ₂

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care
- Allow/assist the patient to assume a position of comfort (usually upright)
- Oxygen: Per nasal cannula at 2-6 LPM or per non-rebreather at 10-15 LPM (depending on the apparent severity)
- Assist with patient-prescribed **Albuterol Sulfate**: If no nebulizer available **Albuterol Sulfate** MDI with spacer 6 Puffs, may repeat X 2
- Administer Nebulizer Therapy: **Albuterol Sulfate** 2.5mg in 3 ml administer with hand held 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 hypopnea occurs
- Airway Adjuncts: If there is loss of consciousness, insert an oropharyngeal, nasopharyngeal, or advanced airway depending on presence of gag reflex refer to *Respiratory Distress Guidelines*

EMT

- Assist with patient-prescribed medications: If no nebulizer available **Albuterol Sulfate** MDI with spacer 6 Puffs, may repeat X 2
- Administer Nebulizer Therapy: **Albuterol Sulfate** 2.5mg in 3 ml with **Ipratropium Bromide (Atrovent)** 0.5mg in 2 ml administer per hand held 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 via HHN
- If in severe distress[1] and still alert, consider CPAP, see *CPAP Procedure*
- Status Asthmaticus(unresponsive to nebs, impending respiratory failure) **EPI-Pen(>66lbs/30kg)** IM (0.3mg) or **EPI-Pen Jr(<66lbs/30kg)** IM (0.15mg) to lateral mid-thigh for moderate or severe reactions). Hold in place for 10 seconds and massage area for 10 seconds after injection, if trained and credentialed.
- Alternative medical director approved epinephrine auto injectors may also be used.
- Drawn up epinephrine and syringe using above dosing only for departments with additional training to do so.

PARAMEDIC

- IV 0.9% NS @ KVO
- If signs of dehydration or hypovolemia are present, administer 500 ml boluses and check lung sounds
- **Methylprednisolone (SoluMedrol)** 125 mg IV/IO/IM (peds dose 2mg/kg)
- Consider **Magnesium Sulfate** 2 gm (peds 50mg/kg) IV slowly (over 10 minutes)
- Consider low dose **Ketamine** for severe CPAP anxiety 0.25mg/kg IV/IO/IM (max dose 25mg), **Fentanyl** 50-100mcg IV/IO/IN/IM, or **Versed** 2mg IV/IO/IN/IM.
- RSA using **Ketamine** unless hypertensive or strong cardiac history dictates **Versed**
- For severe asthma or anaphylaxis, consider **Epinephrine** 0.5mg 1mg/1ml IM
- For imminent respiratory arrest from asthma or anaphylaxis, consider **Push Dose Epinephrine per section 5.42**

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

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Medical Guidelines
2.8 BRADYCARDIA

Note: Pediatric bradycardia is usually due to hypoxia, thus optimizing oxygenation and ventilation is the first key in attempting to reverse pediatric bradycardia.

Priorities	Assessment Findings
Chief Complaint	Syncope, weakness, diaphoresis, unresponsiveness, chest pain
OPQRST	Identify location and radiation, onset, duration progression and severity, presence of intermittent or fluctuating symptoms, factors that provoke (exertion) or palliate (rest) the pain.
Associated Symptoms/ Pertinent Negatives	Chest pain, dyspnea, nausea/vomiting. Pain that is aggravated by breathing and coughing (pleuritic). Cough and fever/chills.
SAMPLE	History of coronary artery disease or risk factors for it. Use of cardiac medications, including aspirin.
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Anxious? Skin: Cool, pale diaphoretic? Neck: JVD? Chest: Laboring to breathe? Lungs: Wheezes, rales, rhonchi? Decreased breath sounds? Heart: Rate, regularity? Legs: Pedal Edema? Neuro: ALOC?
Data	SpO ₂ , 12-Lead EKG, Blood Sugar if Diabetic or ALOC
Goals of Therapy	Increase Heart rate, reduce chest pain, and reduce risk of lethal arrhythmias, early identification of myocardial infarction, and early identification of fibrinolytic therapy candidates.
Monitoring	Cardiac monitoring and SpO ₂

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care
- Administer Oxygen 2-4 LPM per nasal cannula. Increase flow to keep SpO₂ > 94%
- If the patient is having:
 - Chest pain – Refer to the *Chest Pain Guidelines*
 - Shortness of breath – Refer to the *Congestive Heart Failure Guidelines*

EMT

- Acquire 12-Lead ECG, if “***ACUTE MI SUSPECTED***” refer to *Chest Pain Guidelines*

PARAMEDIC

- IV/IO 0.9% Normal Saline @ KVO or saline lock
- If the SBP < 90 mmHg, give a 500 ml fluid bolus, and then reassess, checking lung sounds
- If the patient remains hemodynamically and clinically stable [1], observe and monitor. Prepare for transport. If a second or third degree block is present, place multifunction pads on patient
- Obtain a rhythm strip and/or 12-Lead EKG if not already done
- Give **Atropine Sulfate** 1 mg (peds 0.02mg/kg max single dose 0.5mg child, 1mg adolescent) IV/IO while setting up TCP and rhythm is sinus, unless AMI confirmed
 - May repeat to a maximum of 3mg for adult
 - May repeat to a maximum of 2 mg for adolescent
 - May repeat to a maximum of 1mg for child
- If the patient is or becomes hemodynamically or clinically unstable [1], Initiate transcutaneous pacing (TCP)
 - Initiate transcutaneous pacing (TCP) immediately
 - Turn on pacer and ensure R waves are marked
 - Set the HR at 70 – 80 beats/min
 - Set the voltage at 40 mA initially and watch for the pacer spikes on the monitor
 - Increase voltage by 10 mA every 3-5 seconds until there is 100% capture:
 - A wide QRS complex appears on the monitor after every pacer spike
 - A pulse can be felt in the femoral or carotid artery after every QRS complex
 - Then increase the voltage by 10%
- Monitor pulse and blood pressure
- For sedation while pacing, consider **Fentanyl Citrate** 100mcg IV/IO/IN/IM if SBP >80mmHg, or low dose **Midazolam (Versed)** 2mg IV/IO/IN/IM if SBP >100mmHg(reduce dose by 50% for smaller framed and elderly)
- If persistent hypotension consider **Push Dose Epinephrine per section 5.42** until symptoms resolve or SBP >90
- If no improvement consider:
 - Beta-blocker OD:
Glucagon 0.05 mg/kg IV/IO/IM
 - Calcium channel blocker OD:
Calcium Chloride 20 mg/kg IV/IO
If no improvement, consider **Glucagon** 0.05 mg/kg IV/IO/IM
 - Opiate ingestion:
Narcan 0.1mg/kg IV/IO/IN/IM(1/2 dose each nostril) (usual adult dose is 0.5mg-2.0mg)
Using smaller doses of Narcan is recommended, as the goal is only to increase respirations, not fully awaken patient.

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FOOTNOTES:

[1] Criteria for characterizing a patient as “unstable”*

- Hemodynamic Criteria
 - SBP < 90 mmHg AND Heart Rate <60 beats/min
- Clinical Criteria
 - Signs of shock (poor perfusion) are present, including
 - ALOC, including syncope, weakness, lightheadedness, fatigue
 - Absent radial pulses
 - Pallor and diaphoresis
 - Signs of pulmonary edema are present, including
 - Labored breathing
 - Rales (wet lungs)
 - Hypoxia (SpO₂ <94%)
 - The patient complains of angina

Mercyhealth System
Medical Guidelines
2.10 BURNS

Note:

- This guideline applies to thermal burns, chemical burns and electrical burns
- Scene safety is of utmost concern.
- Loosen and remove any clothing and jewelry that can become constricting when tissue swells.
- In cases of cardiac arrest due to electrical contact or burns, aggressive resuscitation should be attempted, as survival rates are good.
- Burns over 10% should not be cooled with water due to possibility of causing hypothermia.
- Even if the patient meets criteria for burn center referral, they do not need to be airlifted directly to a burn center from the scene.
- In the presence of major trauma (in addition to the burn), stabilizing life-threatening injuries takes precedence over the care of the burn.
- Pain Management should be aggressive. Burn patients may require much higher doses for pain control. See *Pain Management Guidelines*.
- Remember that carbon monoxide and cyanide poisoning is a common complication of burns suffered in a structure fire.

Priorities	Assessment Findings
Chief Complaint	Burns, pain, burning sensation; electrical/lightning injury; chemical (caustic) exposure
OPQRST	Identify cause of burn, exposure time and time of burn
Associated Symptoms/ Pertinent Negatives	Respiratory distress, ulcerous skin in chemical burns, entrance and/or exit wounds with possible cardiac changes in electrical
SAMPLE	Note previous medical conditions that may affect survival
Initial Exam	Scene safety, ABC's support as necessary
Detailed Focused Exam	Vitals: Estimate BSA with "rule of nines" or "rule of palms", BP, HR, RR, Temp, SpO ₂ , General Appearance: Varies depending on burn; may show signs of extreme pain Skin: Depending on the degree on the burn, erythema, blisters, pale leathery appearance, charring, sloughing HEENT: Pupils, check nose & mouth for signs of burns (e.g. soot, edema, redness) Lungs: Signs of respiratory distress, stridor, diminished or absent lung sounds? Heart: Rate and rhythm? Especially in electrical burns Neuro: Loss of movement and/or sensation in extremities, focal deficits?
Data	BSA estimate, EKG, EtCO ₂ , SpO ₂ ,
Goals of Therapy	Stop the burn; airway management; fluid resuscitation; pain control; management of associated injuries; (Decontamination in hazmat incidents)
Monitoring	Watch for cardiac dysrhythmias, increasing respiratory distress and signs of shock

EMERGENCY MEDICAL RESPONDER/EMT

- Routine Medical Care/Routine Trauma Care
- If in cardiac arrest due to electrical injury, see *Cardiac Arrest Guidelines*
- Get the patient away from the heat source. Remove burned, hot, warm, and/or contaminated clothing
- Oxygen 2-4 LPM per nasal cannula or 10-15 LPM per non-rebreather if needed to maintain SpO₂ > 94%
- If the patient is unconscious without a gag reflex, consider oropharyngeal airway or nasopharyngeal airway.
- Remove rings, bracelets, and other constricting items as soon as possible
- Keep the patient warm with dry blankets
- Provide comfort and reassurance
- Place patient in Trendelenburg Position in cases of shock
- If less than 10% body surface area (BSA), dress burns with wet saline dressings or approved burn dressing, but be careful not to induce hypothermia
- If burns are more than 10% BSA, use dry dressings or clean sheets, or approved burn dressing
- Consider non-visualized airway device and request ALS response for advanced airway
 - If airway burns are evident
 - Carbonaceous sputum
 - singing of nasal hairs
 - swelling of the lips, tongue or pharynx due to burns
 - hoarse voice or stridor
 - There is increasing respiratory distress
 - There is decreased level of consciousness with no gag reflex
- **Albuterol** per breathing difficulty guideline

PARAMEDIC

- IV/IO Lactated Ringers
 - Unburned sites are preferred, but burned sites are acceptable
- Monitor ABC's and vitals closely
- <25% BSA, IV TKO, >25% BSA IV wide open for up to 1000ml. Keep track of fluid infused.
- Continue pain control, refer to *Pain Management Guidelines*.
- Consider RSA
 - 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*

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Medical Guidelines
2.12 CARDIAC ARREST

Note:

- These guidelines are based on the principals of the AHA Guidelines movement towards uninterrupted, quality chest compressions. They go further to reduce the biggest two obstacles of a successful resuscitation: interrupted chest compressions and positive pressure ventilation.
- Unlike adult cardiac arrest, which is usually due to a primary cardiac abnormality, pediatric cardiac arrest most often occurs as a result of asphyxia. The most common reasons for this include progressive respiratory failure and shock.
- Capnography should be used as early as possible to provide feedback of quality of compressions.
- 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.
- If ROSC or mechanical compression device in use, begin transport to cath lab capable facility.

Priorities	Assessment Findings
Chief Complaint	Collapsed, unresponsive, not breathing normally
OPQRST	Witnessed or unwitnessed? Estimated time of onset. Circumstances/trauma. Location of patient. Antecedent symptoms/signs (chest pain, difficulty breathing). Environmental factors, medication-related problems or overdose.
Associated Symptoms/ Pertinent Negatives	Bystander-initiated CPR. Pre-arrival CPR instructions from dispatch? Public access AED use.
SAMPLE	Does the patient have any allergies to medications? History of heart disease? Current cardiac medications?
Initial Exam	Open airway, check for normal breathing, if none, begin chest compressions.
Detailed Focused Exam	Vitals Signs: non-breathing (or agonal respirations/gasps) General: Look for rigor mortis, dependent lividity, or unsurvivable trauma. Look for valid Do-not-resuscitate. Skin: Warm/cold, dependent lividity, rash, ecchymosis? HEENT: Airway patent, foreign bodies (e.g. dentures), neck swelling or trauma, trachea in midline, pupil size and response? Chest: Spontaneous respirations, subcutaneous air or crepitation, or deformity? Lungs: Equal breath sounds, difficulty bagging or ventilating? Cardiovascular: Absence of heart sounds, carotid or femoral pulses? Abdomen: Distended? Extremities: Rigor mortis, edema, deformity? Neurological: Unresponsive to verbal and painful stimulation?
Data	Initial Cardiac rhythm, EtCO ₂ , event data
Goals of Therapy	Return of spontaneous circulation (ROSC), provide adequate brain perfusion
Monitoring	Cardiac Monitoring, Vital Signs, and SpO ₂ , EtCO ₂

This page updated 6/8/18

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
- Rule out DNR status, dependent lividity, rigor mortis
- **First Priority: M-(metronome) Quality Chest Compressions**
 - Turn on Metronome, ensuring a rate of 100-120/minute
 - Initiate continuous chest compressions. Pediatric-follow AHA Guidelines
- **Second Priority: C-(compressions) Quality Chest Compressions**
 - Assign two compressors switching every minute, checking each other's quality
 - Depth should be at least 2 to 2.4 inches
 - The heel of the compressor's hand should come off the chest, ensuring full recoil
- **Third Priority: M-(monitor) Defibrillate**
 - Defibrillate as soon as defibrillator is available and ready
 - AED, push analyze (if not trained to perform manual defibrillation) (pediatric patient, it is OK to use adult pads)
 - Immediately resume 2 more minutes of compressions
 - 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 perform dual sequential defibrillation
- **Fourth Priority: A-(airway)**
 - Ventilating with BVM and oral airway increases aspiration risks. Intubation by Paramedic or Supraglottic Airway by First Responder and above. Do not interrupt compressions or defibrillation attempts for airway placement. **Ventilate at 6/minute only enough volume to just make chest rise.** Pediatric-follow AHA Guidelines.
- If ROSC, acquire 12-Lead EKG, if ***ACUTE MI SUSPECTED*** see *Chest Pain Guidelines*

PARAMEDIC

- **Fifth Priority: I-(IV) Establish venous access**
 - Initiate IV/IO 0.9% Normal Saline
 - IV is preferred route for ACLS medications
- Monitor basic rescuer interventions closely, ensure quality, uninterrupted chest compressions
- **Sixth Priority: D-(drugs) Proceed to ACLS resuscitation medications after second shock or immediately for non-shockable rhythms**
 - Obtain IV/IO access, if not already done
 - **Epinephrine** 1mg/10ml 1 mg IV/IO initially and then repeat every 5 minutes
- If any shocks indicated AED or manual, give **Amiodarone** 300 mg IV/IO, followed by another **Amiodarone** 150 mg if still refractory after 2 more cycles of compressions (4 minutes).
- If patient regains pulse prior to amiodarone administration but has received any shocks, 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** 300mg or more bolus during the resuscitation. If arrhythmias develop, follow appropriate protocol.
- **SoluMedrol** 125mg IV/IO in all cardiac arrest immediately after **Epinephrine**. If ROSC obtained prior to any meds, **SoluMedrol** should still be administered as part of post arrest care.
- If refractory V-Fib or Torsades de pointes, consider **Magnesium Sulfate** 2gm IV/IO

This page updated 1/10/22

- 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%)** 1,000mg IV over 2 minutes. May repeat in 5 minutes.
 - Give **Sodium Bicarbonate (8.4%)** 50 mEq IV
 - Give **Albuterol Sulfate** 10 mg via continuous neb if not already given
- Identify and correct reversible causes: The Five H's and the Five 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 6/minute with only enough volume to make chest rise. [1])
 - Hydrogen Ion, i.e. acidosis (Perform ventilation [1])
 - Hyperkalemia [2]
 - Hypokalemia (not treated in the field.)
 - Hypothermia (See *Hypothermia & Frostbite Guidelines*)
 - "The Five T's" (treatment orders are in parentheses)
 - Tablets (See *Toxic Exposure/Overdose Guidelines*)
 - Tamponade (PARAMEDIC: Perform Pericardiocentesis)
 - Tension pneumothorax (PARAMEDIC: Perform needle decompression)
 - Thrombosis, cardiac i.e. myocardial infarction (See *Chest Pain Guidelines*)
 - Thrombosis, pulmonary i.e. pulmonary embolism (No specific pre-hospital treatment available)
- If there is ROSC, as seen as a sudden large increase in EtCO₂ and/or patient movement
 - Reassess the need for airway devices
 - Maintain advanced airway, if the patient remains unconscious
 - If the patient wakes up and shows cognitive response, the airway may be removed. Use the procedures for removing advanced airway devices in the *Respiratory Distress Guidelines*.
 - Monitor patient's EtCO₂ and ventilate accordingly (maintain EtCO₂ around 35-45 mmHg SpO₂>94%)
- Maintain SBP >80 mmHg, Consider **Push Dose Epinephrine per section 5.42**
- If post-resuscitation 12-lead EKG shows STEMI refer to *Chest Pain Guidelines*

FOOTNOTES:

[1] Do not hyperventilate during cardiac arrest, even if hypoxia and acidosis are suspected causes. Strictly follow the ventilation guidelines described above.

[2] Suspect Hyperkalemia when patients with a history of chronic renal failure (dialysis patients) develop cardiac arrest. Pre-arrest history may include weakness, missed dialysis appointment(s), vomiting, concurrent illness, and T waves that are peaked and as large as the R wave.

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Mercyhealth System
Medical Guidelines
2.14 CHEST PAIN

Note:

- Cardiac chest pain (Angina) is usually vaguely described; whereas, pleuritic chest pain is usually precisely defined by location, quality (sharp).
- It is important to acquire 12-Lead as soon as possible with good skin prep and in the supine position as much as possible. A normal ECG doesn't rule out AMI.

Priorities	Assessment Findings
Chief Complaint	Heavy, vague, squeezing, pressure like, dull or achy, discomfort or pain
OPQRST	Identify location and radiation, onset, duration progression and severity, presence of intermittent or fluctuating symptoms, factors that provoke (exertion) or palliate (rest) the pain.
Associated Symptoms/ Pertinent Negatives	Radiation, dyspnea, nausea/vomiting. Pain that is aggravated by breathing and coughing (pleuritic). Cough and fever/chills.
SAMPLE	History of coronary artery disease or risk factors for it. Use of cardiac medications, including aspirin.
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Anxious? Skin: Cool, pale diaphoretic? Neck: JVD? Chest: Laboring to breathe? Lungs: Wheezes, rales, rhonchi? Decreased breath sounds? Heart: Rate, regularity? Legs: Pedal Edema? Neuro: ALOC?
Data	SpO ₂ , 12-Lead ECG, Blood Sugar if Diabetic, EtCO ₂ if ALOC
Goals of Therapy	Reduce chest pain; reduce risk of lethal arrhythmias; early identification of myocardial infarction, and early identification of PCI therapy candidates.
Monitoring	Cardiac monitoring, SpO ₂ and serial 12-Leads

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care
- Titrate oxygen to a saturation of 94-96%
- If the patient also experiences shortness of breath, follow the *Congestive Heart Failure Guidelines*
- Administer **Aspirin** 324 mg PO (4) 81 mg chewable tablets unless the patient is truly allergic or has just taken prior to calling EMS

EMT

- Acquire 12-Lead and transmit to receiving facility. If reads “***ACUTE MI SUSPECTED***”, call for ALS and make arrangements to transport to nearest cardiac cath lab facility. Activate Code STEMI as rapidly as possible. If unable to obtain 12-lead, call for ALS or continue to nearest hospital, whichever is faster to acquire the 12-lead.
- If patient experiences angina, assist the patient in administering the patient’s prescribed **Nitroglycerin** sublingually, unless the Systolic BP < 100 mm Hg
 - Note: No NTG 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 mm Hg
 - Highly recommend transport with two personnel in back of ambulance

PARAMEDIC

- Connect patient to EKG Monitor
- IV/IO 0.9% NS @ KVO or saline lock
- **Nitroglycerin** 0.4 mg SL (sublingually) repeat every 5 minutes, max of three doses, unless Systolic BP < 100 mm Hg
- If the SBP < 90 mmHg, give a 500 ml fluid bolus, and then reassess your patient and the patients lung sounds
- Perform serial 12-Lead EKG and compare with initial. Provide copies to ED physician
- Acquire V4R, if hypotensive or inferior infarct is suspected.
- Acquire V8, if depression is noted in early V leads, to look for posterior infarct
- Apply **Nitroglycerine** paste 1” to left chest unless patient is hypotensive
- Consider **Fentanyl Citrate** 100 mcg, may repeat with max total dose of 300 mcg for persistent pain if patient is hypotensive(reduce dose by 50% for smaller framed and elderly)

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

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2.16 CONGESTIVE HEART FAILURE

Note:

- Remember that acute myocardial infarction may present with shortness of breath (alone) and new onset acute congestive heart failure!

Priorities	Assessment Findings
Chief Complaint	“Difficulty breathing”; “Shortness of breath”
OPQRST	Assess onset, duration, progression, subjective severity, possible triggering events, and response to treatments before EMS arrival.
Associated Symptoms/ Pertinent Negatives	Cardiac chest pain, frothy sputum, blood tinged sputum
SAMPLE	Check past history of CHF or heart disease; medications for CHF (e.g., furosemide, digoxin, ACE inhibitors, long acting nitrates, etc.), and compliance with these medications.
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	<p>General Appearance: Tripod positioning; Severity of distress [1]?</p> <p>Skin: Cool, moist and pale? Warm, dry and flushed? Cyanotic?</p> <p>Neck: JVD?</p> <p>Respiratory Effort: Using accessory muscles, signs of fatigue; two-word sentences?</p> <p>Lung Sounds: The presence of rales (wet lungs) is a strong indication of CHF. Wheezing is also common in CHF.</p> <p>Heart Sounds: Rate, regularity.</p> <p>Peripheral Edema: Pitting edema of the ankles is common in CHF, but its absence does not rule out CHF?</p> <p>Neuro: ALOC? Lethargy? Somnolence?</p>
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

- Routine Medical Care
- Allow/assist the patient to assume a position of comfort (usually upright)
- Oxygen: Per nasal cannula at 2-6 LPM or per non-rebreather at 10-15 LPM (depending on the apparent severity)
- Assisted Ventilation: Consider assisting breathing with gentle synchronous ventilations with bag-valve mask (BVM); Support ventilation with BVM if apnea or hypopnea occurs
- Airway Adjuncts: If there is loss of consciousness and loss of gag reflex, insert an oropharyngeal or nasopharyngeal airway if gag reflex still present
- If the patient is wheezing, assist with use of metered dose inhalers or give **Albuterol Sulfate** 2.5 mg in 3 ml, administer per hand held nebulizer or mask; May repeat X 2 additional doses
- Consider **Aspirin** per Chest Pain Guideline

EMT

- If the patient complains of chest pain (angina):
 - Consider **Aspirin** 324 mg (4- 81 mg baby aspirin tablets) chewed and swallowed
 - If the patient is prescribed nitroglycerine consider assisting them in taking, providing systolic blood pressure >100mmHg
 - Acquire 12-Lead EKG, if not supine mark as such
- Initiate CPAP, refer to *CPAP Procedure* [1]
- Airway Adjuncts: If there is loss of consciousness and loss of gag reflex, insert an advanced airway

PARAMEDIC

- IV/IO 0.9% NS @ KVO or saline lock
- Note: No NTG if patient has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours
- Give **Nitroglycerine** 0.4 mg (1 sublingual spray or tablet) every 3-5 minutes. No maximum dose as long as a SBP >100 is maintained
- If SBP>160 may use **Nitroglycerine** 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**, hold if SBP ≤ 100 mmHg
- If SBP < 90 mmHg withhold NTG and consider **Push Dose Epinephrine per section 5.42** to maintain SBP >100
- Consider RSA if any of the following indications are met: refer to *Respiratory Distress Guidelines*
 - A trial of CPAP with anxiety reducing meds 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)

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 + SPO₂ is <94% + possible ALOC

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Medical Guidelines

2.18 DIABETIC EMERGENCIES

Priorities	Assessment Findings
Chief Complaint	"Low blood sugar" "Altered Level of Consciousness"
OPQRST	Check onset/duration. Identify possible contributing factors [1]. Recent history of frequent episodes.
Associated Symptoms/ Pertinent Negatives	Fever/Chills. Signs/Symptoms of infection.
SAMPLE	Medications for diabetes.
Initial Exam	ABCs and correct any immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Unresponsive? Agitated and combative? Skin: Cool, pale, diaphoretic? Neuro: ALOC? Focal deficits (CVA)?
Data	Blood Glucose
Goals of Therapy	Restore normal mental status
Monitoring	Repeat blood glucose, ensure patient safety prior to obtaining waiver [2].

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care
- Oxygen 2-4 LPM per nasal cannula; Adjust to keep SpO₂ ≥ 94%
- Monitor vitals
- Check blood sugar level:
 - Blood Sugar > 70 mg/dl, monitor
 - Blood Sugar < 70 mg/dl, conscious, give **Glucose Oral Gel** PO
 - Blood Sugar < 70 mg/dl, altered mental status, If available encourage patient or family to use their **Glucagon kit** or use **Glucagon auto injector**, may repeat x1 in 15min
 - If unable to check blood sugar, assume hypoglycemia and treat as above

EMT

- Check blood sugar level:
 - Blood Sugar > 70 mg/dl, monitor
 - Blood Sugar < 70 mg/dl, conscious, give **Glucose Oral Gel** PO
 - Blood Sugar < 70 mg/dl, unconscious, give **Glucagon** 1 mg IM, may repeat x1 in 15min
 - Pediatric patient under 25kg give ½ dose, may repeat x1 in 15min
 - 12 lead EKG

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PARAMEDIC

- Blood sugar < 70 and patient with altered mental status:
- Initiate IV/IO 0.9% NS at KVO or saline lock for access
- Adult patients give **Dextrose 10%** infuse 125ml, recheck blood sugar
- Pediatric patients give **Dextrose 10%** 5ml/kg to max of 125ml, recheck blood sugar
- Administer additional dose as above if blood sugar remains below 70
- Reassess BGM and mental status 5 minutes after completion of infusion
- If blood glucose>180mg/dl initiate IV 0.9% NS and run wide open, verify clear lung sounds after each 500ml bolus, up to 2L

FOOTNOTES:

[1] Contributing factors

- Too much or too little insulin?
- Decreased PO intake?
- Overexertion
- Dehydration
- MI
- Illness

[2] Ensuring Patient Safety

- Adequate social support is available
- The patient has access to food or money to buy food
- The patient is not ill or in need of immediate medical attention
- Document proper IV removal and site inspection
- Patients on sulfonylurea oral agents refusing transport. These patients are at high risk of rebound hypoglycemia and require transport and hospital observation.

Mercyhealth System
Medical Guidelines
2.20 ECLAMPSIA

Note:

- Eclampsia occurs in pregnant patients with “preeclampsia”. Preeclampsia is a syndrome that involves hypertension [2] and output of protein in the urine.
 - Preeclampsia occurs most often (but not exclusively) in non-white first-time mothers in their teens or early twenties from low socioeconomic backgrounds, or in mothers over the age of 35. Other risk factors include previous pregnancy with preeclampsia, multiple fetuses, a family history of preeclampsia and obesity.
 - Eclampsia occurs when seizures and/or coma develop between the 20th week of pregnancy and the 4th week after delivery
- There is a significant associated risk of death for the mother and the baby. Maternal complications of Eclampsia include: placental abruption, hemorrhagic stroke, pulmonary edema, cardiac arrest, and postpartum hemorrhage.
- Versed can be given more rapidly to break seizure, but should be followed with Magnesium sulfate, as it is the drug of choice for treating seizures in Eclampsia.

Priorities	Assessment Findings
Chief Complaint	Seizure/coma in mid to late pregnancy or within a month after delivery
OPQRST	Generalized, tonic-clonic type seizures (usually), lasting (3-4 minutes) that resolve spontaneously
Associated Symptoms/ Pertinent Negatives	Has the doctor told her that she has developed high blood pressure during this pregnancy with protein in the urine and swelling of the ankles? Has she had adequate prenatal care? Other symptoms of preeclampsia may be present [1].
SAMPLE	If the mother has had adequate prenatal care, she may already know that she has a diagnosis of “preeclampsia”, or “pregnancy-induced hypertension”, but not always.
Initial Exam	ABCs and correct and immediately life-threatening problems
Detailed Focused Exam	Vital Signs: BP [2], HR, RR, Temp, SpO ₂ General Appearance: Seizing or postictal? Incontinent (bowel, bladder)? Abdomen: Appears pregnant? Skin: Pale, cool, moist? Cyanotic? Eyes: Dilated pupils during the seizure? Mouth: Frothy salivation? Tongue biting? Legs: Pedal edema? Neuro: Focal deficits? ALOC?
Data	SpO ₂ , Blood Sugar (to rule out hypoglycemia as a cause of the seizure)
Goals of Therapy	Protect the mother from injury during seizures, stop recurrences of the seizures.
Monitoring	Blood pressure, HR, SpO ₂ , Neuro Status; Cardiac Monitor for possible rhythm disturbances

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EMERGENCY MEDICAL RESPONDER

- Routine Medical Care, Provide comfort and reassurance
- If unconscious with a stable airway, pregnant patients should be placed in the recovery position on their left side
- Administer oxygen as needed to maintain SPO2 >94% with nasal cannula, NRB or BVM

EMT

- If the airway is not stable, insert a nasopharyngeal airway, an oropharyngeal airway or a non-visualized airway
- If blood sugar is <70mg/dl, administer **Glucagon** 1 mg IM

PARAMEDIC

- IV 0.9% NS @ KVO
- Initiate a 500 ml bolus if there are signs of hypotension or shock
- Blood sugar < 70 and patient with altered mental status:
- Initiate IV/IO 0.9% NS at KVO or saline lock for access
- Adult patients give **Dextrose 10%** infuse 125ml, recheck blood sugar
- Administer additional dose as above if blood sugar remains below 70
- Reassess BGM and mental status 5 minutes after completion of infusion
- **Midazolam (Versed)** 5mg IV, IO, IN or 10mg IM q5 minutes (max 20mg)
 - Monitor patient closely for hypotension, sedation and respiratory depression
 - 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
- After initial dose of Versed, **Magnesium Sulfate** 4 grams in 100ml NS IVPB/IOPB over 10 min with primary IV running wide open while administering drug. Be aware of side effects [3]
 - Monitor patient closely for hypotension, muscle weakness (including respiratory muscle paralysis), and heart rhythm disturbances
- Maintain SBP between 140-160 mmHg and DPB between 90-110 mmHG
 - **Labetalol** 10mg IVP over 2 min, if no effect, may repeat 20mg IVP in 10 min to a max of 100mg.
 - If Labetalol not available, **Metoprolol** 5mg IVP, repeat every 5 min to max of 15mg.
 - For either medication hold if SBP<140 or DBP<80 or HR<60.

FOOTNOTES:

[1] Other symptoms of preeclampsia include: headache, blurred vision, epigastric abdominal pain, nausea and swelling of the hands, feet and face (generalized edema)

[2] Hypertension during pregnancy is defined by a systolic pressure over 140 mmHg and a diastolic pressure over 90 mmHg. Pregnancy usually lowers the blood pressure. A rise in the blood pressure after the 20th week of gestation is worrisome for preeclampsia. Eclampsia sometimes occurs even in women with blood pressures below 140/90 mmHg

[3] Side effects include: flushing, sweating, warm sensation. Early signs of toxicity: reduced reflexes and hypotension

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Mercyhealth System
Medical Guidelines
2.22 EMERGENCY CHILDBIRTH

Note:

Priorities	Assessment Findings
Chief Complaint	Uterine contractions, "in labor"
OPQRST	Location of pain, radiation of pain, time of onset of contractions, interval between contractions, quality of contractions, severity of contractions, events surrounding onset of contractions, due date
Associated Symptoms/ Pertinent Negatives	Vaginal bleeding (presence, quantity, and character), "bloody show," leakage of fluid or discharge, need to "push," "bear down," or have a bowel movement, presence of fetal movement, RUQ pain, vomiting, visual changes
SAMPLE	<ul style="list-style-type: none"> • Allergies • Medications • Past medical history, past surgical history, number of previous pregnancies, previous Cesarean delivery, prenatal care • Previous pregnancy or delivery complications (eclampsia, precipitous delivery, etc.) • Recent infectious diseases • Complications of current pregnancy (i.e. preeclampsia, placenta previa, gestational diabetes, premature labor, ultrasound showing abnormal fetal position etc.) • Last meal
Initial Exam	ABCs
Detailed Focused Exam	<p>HEENT: Cracked lips, sunken eyes or cheeks indicating dehydration</p> <p>Skin: Cool, pale diaphoretic</p> <p>Chest: Labored breathing</p> <p>Heart: Tachycardia</p> <p>Abdomen: Scars, Tenderness, masses, uterine size/location, distention, deformity</p> <p>Legs: Edema</p> <p>Neuro: Mental status</p> <p>Gyn: Vaginal bleeding, infant head crowning, prolapsed cord, presenting part, meconium staining</p>
Goals of Therapy	<p>Atraumatically deliver newborn with maintenance of normal vital signs for both mother and newborn</p> <p>Resuscitate if >23 weeks gestational age, uncertainty of dates, signs of life, or EMS discretion</p> <p>Ensure a report is made of fetal death >20 weeks gestational age to office of vital statistics</p>
Monitoring	BP, HR, RR, frequency of contractions.

EMERGENCY MEDICAL RESPONDER/EMT

- Routine Medical Care
- Administer oxygen as appropriate
- Maintain patient in position of comfort, preferably on left side, but typically delivery will require supine position with knees flexed and legs apart
- Evaluate for imminent delivery
 - History of precipitous delivery
 - Contractions 2 or less minutes apart
 - Mother feels need to push or have bowel movement
 - Visually inspect perineum for crowning
- If delivery appears imminent, open OB pack, apply sterile gloves, and drape abdomen
- Proceed with emergent transport if:
 - If there is a breech presentation, coach the mother to perform shallow breathing and avoid pushing
 - If there is a prolapsed umbilical cord, place gloved fingers into the vagina to hold the vaginal wall away from the cord
 - If there is massive hemorrhage, hypotension, or shock, place the mother in the left lateral recumbent position
- In the absence of a breech presentation or prolapsed umbilical cord, do not attempt to prevent or delay delivery
- Control rate of delivery of head using palm of your hand, applying gentle pressure to protect perineum
- When head is delivered, compress bulb suction device and place into mouth to suction mouth then repeat for nose
- Limit suction to ten (10) seconds
- Check to see if cord is wrapped around baby's neck
 - If so, gently attempt to slip cord over the baby's head if cord is semi-loose
 - If cord cannot be slipped over head or cord is tight, clamp two sites on the cord and cut between clamps – Use of scissors is preferred over scalpel
- 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 baby delivers, grasp ankles in one hand and hold head with the other
- Prevent heat loss - Provide warm environment, dry baby, and wrap baby in clean blanket
- Slightly extend head to facilitate patent airway
- Suction mouth then nose as needed, do not aggressively suction as this may stimulate bradycardia
- Continue to maintain an open airway and assess breathing rate and effort
- Provide tactile stimulation as needed to facilitate normal respiratory effort, continually reassessing airway patency
- Assess circulation. Do not raise baby above level of vagina until cord is clamped and cut
- If heart rate <100 beats per minute, provide artificial respirations at a rate of 40-60 breaths per minute and continue to monitor heart rate. The primary measurement of adequate initial ventilation is prompt improvement in heart rate
- If heart rate <60 beats per minute, begin CPR and refer to *Bradycardia Guidelines*
- Place baby lower than placenta and assess cord pulsations
- After pulsations have ceased, double clamp cord at approximately 6" and 8" from baby and cut between clamps
- Assess baby for APGAR scoring [1] at 1 and 5 minutes after recorded time of birth
- BGM if signs of hypoglycemia
- If baby is premature (<36 weeks gestation), prepare for neonatal resuscitation and early transport
- Allow for delivery of placenta if mother and baby are stable
- If significant post-delivery bleeding is present, massage fundus abdominally to stimulate uterine contraction and/or allow baby to breast-feed
- If perineum is torn/bleeding, apply direct pressure with gauze
- Notify ED early on to allow OB and ED to prepare for arrival

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PARAMEDIC

- Establish IV/IO NS @ TKO, if approved and time permits
- Fluid bolus 500ml for hypotension/shock. Reassess vital & lung sounds and repeat
- If patient is hypertensive and experiences seizure, see *Eclampsia Guidelines*
- Consider alternate EZ-IO locations if unable to gain proximal tibia access
- If during delivery meconium staining is present do not suction nose and mouth immediately after delivery of infant's head. Allow completion of delivery and if infant does not cry vigorously immediately, place baby in a supine position WITHOUT stimulation and visualize the airway with a laryngoscope
- Advance ETT or smallest soft suction catheter, 1-2 cm past vocal cords
- Apply suction and slowly remove ETT
- Repeat procedure with a new ETT with each insertion in rapid succession until clear fluid is present
- This procedure is not needed if the infant is immediately crying vigorously without stimulation after birth
- Paramedics may transport patient on Pitocin drip, but will not initiate it.

FOOTNOTES:

[1] APGAR Scores are performed at one 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

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Mercyhealth System
Medical Guidelines
2.24 HEAT EMERGENCIES

Note:

- Heat emergencies can afflict any age patient, with or without underlying health problems, in a variety of ambient temperatures
- High temperatures, high humidity, and high exertion are often factors that lead to a heat emergency
- Heat emergencies are most common in elderly patients, infants and young children, morbidly obese patients, athletes, and other patients with underlying health problems
- Heat exhaustion is a circulatory system problem. It presents as hypovolemia. The patient has a normal or slightly elevated core temperature problem.
- Heat stroke is a life threatening neurological problem. The patient has an extremely high core temperature problem.
- 50% of heat stroke patients have hot, red, dry skin. 50% of heat stroke patients have hot, red, moist skin.
- Hyperthermia may be a result of illegal drug use
- Many medications and illnesses compromise body's ability to thermo regulate
- Water intake and urination frequency are key history findings to differentiate hyponatremia and heat exhaustion

Problem	Cause	Core Temperature	Clinical Findings and History
Heat Cramps	Dehydration Electrolyte imbalances	99-101.3 F	Most common in children and athletes Severe localized cramps in abdomen or extremities Normal vital signs 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, intense headaches, profuse sweating, nausea and vomiting, and limited to no urine output Compensated: Altered mental status--lethargy or irritability, Elevated pulse and respirations, Normal blood pressure Decompensated: Decreased level of consciousness, Decreased blood pressure, elevated pulse and respirations
Heat Stroke	Dangerous Core Temperature	> 105 F	Altered mental status, decreased level of consciousness, skin color temperature and moisture is not a reliable finding, increased pulse and respirations, hypotension,
Hyponatremia	Electrolyte depletion or dilution		Inadequate food or electrolyte intake, excessive water intake, frequent urination, altered mental status, ataxia, nausea and vomiting, headache

Priorities	Assessment Findings
Chief Complaint	"Person hot, lethargic, acting funny, lethargic in a hot environment"
OPQRST	What led up to this? Where was the patient found?
Associated Symptoms/ Pertinent Negatives	Consider other causes of altered mental status—i.e. drug use, hypoglycemia, head injury, toxin inhalation or ingestion.
SAMPLE	Check for medications that could be contributory (beta blockers, psychiatric medications, sedatives, narcotics or barbiturates). Inquire about fluid consumption and frequency of urination
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ If possible, obtain an oral or rectal temperature in the field with a digital thermometer. General Appearance: overdressed for environment, sweating, evidence of trauma? Skin: pale, cool clammy OR hot, red, dry OR hot, red, moist Lungs: breath sounds Heart: Rate and rhythm? Neuro: Loss of coordination, impaired judgment, altered mental status, decreased level of consciousness
Data	SpO ₂ , Blood glucose, 12-Lead EKG
Goals of Therapy	<ol style="list-style-type: none"> 1. End the heat challenge and increase heat loss from conduction, convection, radiation, and evaporation 2. Support ABCs 3. NO oral or IV fluids to hyponatremia patients without electrolyte replacement
Monitoring	SpO ₂ , Cardiac Monitoring

EMERGENCY MEDICAL RESPONDER/EMT

- Routine Medical Care
- 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 hot surfaces, i.e. running track or asphalt road
- Remove excessive clothing
- No food or fluids if the patient has altered consciousness, nausea, vomiting, or is otherwise not in control of his/her own airway
- Oxygen 2-4- LPM per nasal cannula, or higher flow rate to keep SpO₂ ≥94%
- Begin rapid cooling
 - If possible, aggressively mist patient with tepid water and fan (Preferred method)
 - Apply ice packs in neck, armpits, groin, palms of hands, and soles of feet
 - As a last resort, cover patients with cool, wet sheets
 - Prepare for rapid transport
- Additional Heat Stroke Considerations
 - Do not delay transport to begin cooling patient on-scene
 - Start cooling en route to the hospital

PARAMEDIC

- IV/IO 0.9% NS
 - Run wide open, check vitals every 500 ml bolus x 2 for heat exhaustion or heat stroke patients
- Consider a second IV
- Do not delay transport to initiate an IV.
- Consider external jugular or intra-osseous venous access, if an IV has not been established
- Consider endotracheal intubation, if the patient is unresponsive without a gag reflex
- To control seizures refer to *Seizure Guidelines*

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2.26 HYPERTENSIVE CRISIS

Note:

- Hypertension in an asymptomatic patient should not be treated pre-hospital.
- Hypertensive crisis is defined as symptoms of end organ damage(severe headache with neuro changes(dizziness, blurred vision, altered LOC), dyspnea, edema, chest pain, arrhythmia as a result of the hypertension, >220 systolic or >120 diastolic in non-pregnant patients.
- This measurement should be manually taken and confirmed with multiple measurements at least 5 minutes apart.

Priorities	Assessment Findings
Chief Complaint	Palpitations, fast heart rate, shortness of breath, chest pain, weakness
OPQRST	Onset and duration, precipitating factors and circumstances, associated symptoms, stroke symptoms, nausea vomiting
Associated Symptoms/ Pertinent Negatives	Chest pain, shortness of breath, weakness, anxiety, leg swelling
SAMPLE	Previous history, history of thyroid disease, CAD, cardiac medications
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	Vitals Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Skin: Cool, pale diaphoretic Neck: JVD? Chest: Labored breathing Lungs: Wheezes, rales, rhonchi? Decreased breath sounds? Heart: Regular, rate fast or slow, murmur Legs: Edema? Signs of an acute arterial occlusion (embolism)? Neuro: ALOC? Signs of stroke?
Data	SpO ₂ , 12-Lead EKG, Blood Sugar if Diabetic or ALOC
Goals of Therapy	Decrease Rate, treat chest pain, treat CHF
Monitoring	Cardiac Monitoring and SpO ₂

EMERGENCY MEDICAL RESPONDER/EMT

- Routine Medical Care
- Administer Oxygen 2-4 LPM per nasal cannula. Increase flow to keep SpO₂ >94%
- Transport sitting upright or head of cot at 30 degrees
- If the patient has suffered a stroke, follow the *Stroke Guidelines*

PARAMEDIC

- IV 0.9 Normal Saline TKO
- If treated, goal is to reduce BP by no more than 20% in first hour.
 - **Labetalol** 10mg IVP over 2 min, if no effect, may repeat 20mg IVP in 10 min to a max of 100mg.
 - If Labetalol not available, **Metoprolol** 5mg IVP, repeat every 5 min to max of 15mg.
 - For either medication hold if SBP<140 or DBP<80 or HR<60.

Or

- **NTG Paste** 1" to chest
- Follow pain management guideline for pain that may be contributing to HTN

FOOTNOTES:

If the patient is hemodynamically and clinically stable, transport, observe and monitor. Efforts to reduce the blood pressure will add little benefit

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2.28 HYPOTHERMIA & FROSTBITE

Note:

- Most cases of accidental hypothermia encountered by EMS involve alcohol and drug abuse.
- In the hypothermic patient, rough handling can precipitate ventricular fibrillation.
- When checking pulses and respiratory rates, check for 60 seconds, because Bradycardia and bradypnea are common in moderate to severe hypothermia.
- Look for signs of trauma in all patients with hypothermia.
- Hypothermia may be categorized by mild, moderate and severe. The following table may be used to estimate the degree of hypothermia based on clinical findings.

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

Priorities	Assessment Findings
Chief Complaint	"Person found down in a cold environment"
OPQRST	What led up to this? Where was the patient found?
Associated Symptoms/ Pertinent Negatives	Associated trauma and MOI? Drug or alcohol use?
SAMPLE	Check for medications that could be contributory (beta blockers, psychiatric medications, sedatives, narcotics or barbiturates).
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	<p>Vital Signs: BP, HR, RR, Temp, SpO₂</p> <p>If possible, obtain a rectal temperature in the field with a digital thermometer.</p> <p>General Appearance: Shivering, paradoxical undressing, evidence of trauma?</p> <p>Skin: Signs of frostbite (pallor, blisters)?</p> <p>Lungs: pulmonary edema?</p> <p>Heart: Rate and rhythm?</p> <p>Neuro: Loss of coordination, impaired judgment, ALOC?</p>
Data	SpO ₂ , Blood glucose, 12-Lead EKG, EtCO ₂
Goals of Therapy	Above all, avoid rough handling! Initiate Active and passive external rewarming measures in the field. Support airway, breathing and circulation. Do not attempt to thaw frozen limbs in the field.
Monitoring	SpO ₂ , Cardiac Monitoring, EtCO ₂

EMERGENCY MEDICAL RESPONDER

- Attempt to remove the patient from the cold environment if it can be done gently. Rough handling must be avoided
 - 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
 - Initiate passive rewarming with blankets on top of and underneath the patient; insulate the patient from the cold ground; shield them from the cold wind
 - Initiate active external rewarming with warm blankets and hot packs in the axilla and groin
 - Oxygen 2-4- LPM per nasal cannula, or higher flow rate to keep SpO₂ ≥94%
 - If there is a pulse, no matter how slow, do not initiate chest compressions
 - If there is no pulse, continue CPR 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 not even started) in the field
 - Apply an AED and analyze. If shocks are indicated, attempt defibrillation
 - The first shock should be given no matter what the core temperature is
 - Do not delay defibrillation to measure a core temperature
 - Do not attempt to defibrillate more than once until the core temperature is documented to be > 86 °F
 - If the patient is shivering and can swallow, support thermogenesis by giving the patient warm fluids and calories
- Glucose Oral Gel**

EMT

- If frozen limbs are fractured and angulated, splint in the position found. Do not attempt to straighten until they are completely thawed
- Attempt to administer warmed humidified oxygen by mask [1]

PARAMEDIC

- IV/IO 0.9% NS
- If warm saline [2] is available, give 500 ml boluses, up to 1000 ml, rechecking lung sounds at those increments
- Consider a second IV of warm saline, but do not delay transport to initiate an IV
- Consider external jugular or alternate EZ-IO site access, if an IV has not been established
- Consider endotracheal intubation, if the patient is unresponsive without a gag reflex
 - There is no evidence that laryngoscopy or tracheal intubation increases the risk of ventricular fibrillation
 - Administer warm humidified oxygen [1]
- If cardiac arrest is present, attempt defibrillation, if not already done
 - If the core temperature is < 86 °F, no more than one shock, focus on high quality compressions and warming. Defibrillation has low likelihood of success at temperatures less than < 86 °F
 - Obtain a rectal temperature before more shocks are given
 - If the core temperature is > 86 °F, additional shocks may be attempted in the field see *Cardiac Arrest Guidelines*
 - If the core temperature is unknown, continue CPR and transport emergently to the hospital
- All other resuscitation medications should be withheld until the core temperature is > 86 °F
 - Double or triple the dosing interval for all medications given, because hypothermia slows metabolism
- If Bradycardia is present,
 - Pacing 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

[2] Technique for warming IV Fluids in the field

- Use IV fluid warmer to maintain warm fluids, rotate stock frequently
- Place IV fluids in front of heating vents in vehicle while enroute to call
- Wrap the IV tubing around a hot pack several times

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2.30 HYPOVOLEMIA & SHOCK

Note:

- Potential causes of hypovolemia and shock include:
 - Infections/sepsis
 - If suspected sepsis based on below signs/symptoms, notify receiving facility of Sepsis Alert
 - T<36C or T>38C, P>90, BP<90, RR>20, BGM>120(no DM hx), etCO₂<25, acute MS changes, chills/rigors,
 - Trauma
 - Hemorrhage (Internal, External)
 - Spinal cord injury
 - Pump Failure
 - Heart Rhythm Disturbances
 - Dehydration
 - Drugs and Toxins
 - Vasovagal Syncope
 - Metabolic Disturbances
 - Anaphylaxis
 - Pulmonary Embolism
 - Aneurysms
- Shock is defined as inadequate perfusion of vital organs, not merely hypotension. Clinical evidence of shock includes altered mental status.

Priorities	Assessment Findings
Chief Complaint	"Altered Level of Consciousness"
OPQRST	Identify onset, duration, progression and provocation.
Associated Symptoms/ Pertinent Negatives	Fever/Chills, Chest Pain (Angina), Trauma
SAMPLE	Pertinent past history and medications may provide important clues.
Initial Exam	ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ , EtCO ₂ General Appearance: Does the patient appear ill? External Hemorrhage? Skin: Pale, cool, and moist? Flushed, warm and dry? Chest: Labored breathing? Lungs: Wheezes, rales or rhonchi? Heart: Rate and Rhythm? Abdomen: Internal hemorrhage? Tender? Distended? GI Blood loss? Extremities: Trauma? Edema? Neuro: ALOC?
Data	SpO ₂ , 12-Lead EKG, Blood Sugar, EtCO ₂
Goals of Therapy	Restore volume and support blood pressure
Monitoring	Blood pressure, heart rate and cardiac rhythm

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EMERGENCY MEDICAL RESPONDER/EMT

- Routine Medical -or- Trauma Care
- Secure and maintain airway
- Perform non-visualized advanced airway, if indicated
- Administer oxygen per non-rebreather mask at 15 LPM
- Control external hemorrhage
- Keep patient flat with lower extremities elevated (if possible)
- Conserve body temperature, and reassure patient

PARAMEDIC

- IV/IO 0.9% NS through large bore catheter
- Initiate IV/IO wide open to maintain SBP>100, recheck lung sounds frequently
- Adult fluid bolus: 30ml/kg, for max of 3L
- Pediatric fluid bolus: 20ml/kg up to 3 times, for max of 60ml/kg
- Document total fluids given and report to receiving facility
- If trauma patient see *Routine Trauma Care*
- Consider RSA see *Respiratory Distress Guidelines*
- **Push Dose Epinephrine per section 5.42** titrated to maintain a SBP > 90 mmHg
- If hemorrhagic shock refer to 2.42 *Routine Trauma Care* for TXA indications and dosing

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2.32 NARROW COMPLEX TACHYCARDIA

Note:

- Narrow complex rhythms have a QRS duration < 0.12 sec

Priorities	Assessment Findings
Chief Complaint	Palpitations, fast heart rate, shortness of breath, chest pain, weakness
OPQRST	Onset and duration, precipitating factors and circumstances, associated symptoms, stroke symptoms, nausea vomiting
Associated Symptoms/ Pertinent Negatives	Chest pain, shortness of breath, weakness, anxiety, leg swelling
SAMPLE	<ul style="list-style-type: none"> Previous history, history of thyroid disease, CAD, Cardiac Medications Obtain history of previous episodes of tachycardia, including diagnoses if known. Pay particular attention to whether there is an underlying history of pre-excitation, including the Wolff-Parkinson-White (WPW) Syndrome. Obtain history of what medications have been used to treat previous arrhythmias, if known. Obtain history of any previous complications from previous arrhythmia treatments, if known. Obtain history of the duration of the current episode of tachycardia, if known.
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	<p>Vitals Signs: BP, HR, RR, Temp, SpO₂, EtCO₂</p> <p>General Appearance: Anxious?</p> <p>Skin: Cool, pale diaphoretic</p> <p>Neck: JVD?</p> <p>Chest: Labored breathing</p> <p>Lungs: Wheezes, rales, rhonchi? Decreased breath sounds?</p> <p>Heart: Regular, rate fast or slow, murmur</p> <p>Legs: Edema</p> <p>Neuro: ALOC? Signs of stroke?</p>
Data	SpO ₂ , 12-Lead EKG, EtCO ₂ , Blood Sugar if Diabetic or ALOC
Goals of Therapy	Decrease Rate, treat chest pain, treat CHF
Monitoring	Cardiac Monitoring and SpO ₂

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care
- Administer Oxygen 2-4 LPM per nasal cannula. Increase flow to keep SpO₂ >94% For difficulty breathing allow patient to sit upright, see *Respiratory Distress Guidelines*

EMT

- For angina or chest pain, see *Chest Pain Guidelines*
- With neurological deficit indicating stroke, follow the *Stroke Guidelines*
- Acquire 12-Lead EKG, if reads “***ACUTE MI SUSPECTED***”, see *Chest Pain Guidelines*
- If the rhythm is faster than 150, is perfectly regular, and the patient is stable, attempt Valsalva maneuvers.
 - Have patient bear down.
 - If no success, have seated patient blow through a 10ml syringe enough to move plunger. Once plunger moves, lie them flat and elevate their legs.

PARAMEDIC

- IV 0.9 Normal Saline. Large bore catheter in an antecubital site is preferred for the administration of Adenosine.
- If SBP < 90 mmHg give 500 ml fluid bolus, and then reassess vitals and lung sounds
- If the patient is hemodynamically or clinically unstable [1]
- Consider **Fentanyl Citrate** 100 mcg IV/IO/IN/IM for pain control before or low dose **Versed** 2mg IV/IO/IN/IM, but don't delay cardioversion (reduce dose by 50% for smaller framed and elderly)
 - Prepare to perform synchronized cardioversion
 - Perform first synchronized cardioversion @ 150 Joules
 - If unsuccessful, increase by 50 joules for each subsequent attempt
- Obtain 12 Lead EKG, if not already done
- Narrow Complex Tachycardia include:
 - Sinus Tachycardia (regular, generally < 160 bpm)
 - Rapid Atrial Fibrillation/Flutter (RAF) (irregular, generally 120-180)
 - Supraventricular Tachycardia (SVT) (regular, generally > 180)
- If sinus tachycardia is present, the underlying causes include: pain, dehydration, hypotension, shock, hypoglycemia, hypoxemia, anxiety, fever, sepsis, drug induced, recent heavy exertion, hyperthyroidism and anemia
 - Do not treat sinus tachycardia with medications or cardioversion
- If the patient is mildly Hypotensive (80 – 100 mmHg) but without other serious signs or symptoms, a trial of adenosine is acceptable without history of WPW [2]
 - **Adenosine** 6 mg IV over 1-2 seconds. If unsuccessful, repeat with 12 mg (may repeat once) IV over 1-2 seconds. Follow all doses with a 20-30 ml saline flush by rapid IV push
 - 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 the patient's narrow, regular tachycardia exceeds 180 BPM without other serious signs or symptoms, and without a history of WPW, a trial of **Adenosine** is acceptable (see doses above)
- For patient with history of WPW **Amiodarone** 150 mg IV over ten minutes
- **Diltiazem (Cardizem)** 0.25 mg/kg (standard dose is 15mg) IV slowly over 5 min can be given for an irregular narrow tachycardia (Rapid Atrial Fibrillation/Flutter) with the following indications:
 - RAF is causing mild hypotension (SBP 80 – 100 mmHg) but no other serious signs or symptoms are present
 - RAF is causing an acute exacerbation of CHF and the SBP is normal to high
 - RAF is causing rate-related chest pain
- If inadequate response after 15 minutes, may rebolus at 0.35mg/kg (usual dose 20mg) IV slowly over 5 minutes
- Monitor for hypotension, which is usually transient and not clinically significant

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FOOTNOTES:

[1] Criteria for characterizing a patient as “unstable”

- Hemodynamic Criteria
 - SBP < 80 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 (SpO₂ < 94%)
 - The patient complains of angina

[2] Patients with a history of Wolf-Parkinson-White (WPW) Syndrome

[3] Pediatric Considerations

- Infants treat rate >220
- Children treat rates >180
 - Utilize Broselow or approved medical director product or app for dosing
 - Adenosine 0.1mg/kg first dose (max 6mg)
 - Adenosine 0.2mg/kg second/third dose (max 12mg)
 - Cardioversion 1j/kg first attempt
 - Cardioversion 2j/kg subsequent attempts
 - Consider sedation with Fentanyl or Versed

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2.32 WIDE COMPLEX TACHYCARDIAS

Note:

- Wide complex rhythms have a QRS duration > 0.12 sec
- Although some wide complex tachycardias develop from supraventricular tachycardias, pre-hospital providers should always assume that wide complex rhythms are ventricular tachycardia (VT), particularly if the patient is unstable [1].
- Treating wide complex tachycardias with medications used to treat supraventricular tachycardias is fraught with danger and must be avoided in the pre-hospital setting [2]
- Oxygen goal is to titrate to keep saturation between 94% and 96% as long as patient is not complaining of shortness of breath.

Priorities	Assessment Findings
Chief Complaint	Palpitations, fast heart rate, shortness of breath, chest pain, weakness, syncope, cardiac arrest/pulseless non-breather
OPQRST	Onset and duration, precipitating factors and circumstances, associated symptoms, stroke symptoms, nausea vomiting
Associated Symptoms/ Pertinent Negatives	Chest pain, shortness of breath, weakness, anxiety, leg swelling
SAMPLE	<ul style="list-style-type: none"> • Previous history, history of thyroid disease, CAD, Cardiac Medications • Obtain history of previous episodes of tachycardia, including diagnoses if known. Pay particular attention to whether there is an underlying history of pre-excitation, including the Wolff-Parkinson-White (WPW) Syndrome. • Obtain history of what medications have been used to treat previous arrhythmias, if known. • Obtain history of any previous complications from previous arrhythmia treatments, if known. • Obtain history of the duration of the current episode of tachycardia, if known.
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	Vitals Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Skin: Cool, pale diaphoretic Neck: JVD? Chest: Labored breathing Lungs: Wheezes, rales, rhonchi? Decreased breath sounds? Heart: Regular, rate fast or slow, murmur Legs: Edema Neuro: ALOC?
Data	SpO ₂ , 12-Lead EKG, Blood Sugar if Diabetic or ALOC
Goals of Therapy	Decrease Rate, treat chest pain, treat CHF
Monitoring	Cardiac Monitoring and SpO ₂

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care
- Administer Oxygen 2-4 LPM per nasal cannula. Increase flow to keep SpO₂ >94%
- If the patient is having difficulty breathing allow them to sit upright
- If the patient becomes unresponsive, pulseless and non-breathing, follow the *Cardiac Arrest Guidelines*
- If the patient also experiences shortness of breath, follow the *Congestive Heart Failure Guidelines*

EMT

- If patient experiences angina, administer patient's prescribed **Nitroglycerin** sublingually, unless the Systolic BP < 100 mm Hg
 - Note: No NTG if pt has used Viagra or Levitra in the last 24 Hours, Cialis in the last 48 Hours
 - Give NTG every 5 minutes until pain is relieved up to three times
 - Repeat BP before each Nitroglycerin dose
 - Discontinue nitroglycerine if the Systolic BP drops below 100 mmHg
 - Document all BP's and the number of Nitroglycerin doses given
- Perform a 12-Lead EKG

PARAMEDIC

- IV 0.9 Normal Saline or saline lock
- If SPB < 100 mmHg give 500 ml fluid bolus then reassess
- Interpret 12-Lead EKG, or perform if not already done
 - Do not routinely treat PVC's or short (less than 6 beats) runs of VTACH
 - Differentiate between monomorphic and polymorphic ventricular tachycardia
 - Differentiate between regular and irregular rhythms
 - **Regular rhythms are monomorphic VT until proven otherwise** (e.g. PSVT with aberrancy)
 - **Irregular rhythms are polymorphic VT (including Torsades de Pointes) until proven otherwise** (e.g. Atrial Fibrillation with aberrancy or pre-excitation)
- For all stable patients with monomorphic VT
 - **Amiodarone** 150mg slow IV bolus over 10 min or 150mg drip over 10 minutes, may repeat x1
 - If amiodarone unsuccessful, consider **Magnesium** 2 grams IV slowly (over 10 minutes)
 - Provide supportive care and monitor the patient closely during transport
- If the patient is hemodynamically or clinically unstable [1] with monomorphic VT
 - Prepare to perform synchronized cardioversion. [2]
 - Perform first synchronized cardioversion @ 150 Joules.
 - If unsuccessful, increase by 50 joules for each subsequent attempt.
- If the patient is hemodynamically or clinically unstable [1] with polymorphic VT, or if the patient develops pulseless VT defibrillate (i.e. unsynchronized cardioversion) at max Joules
- Consider **Fentanyl Citrate** 100mcg IV/IO/IN/IM or low dose **Versed** 2 mg for sedation and pain control before cardioversion or defibrillation (reduce dose by 50% for smaller framed and elderly)
- For all stable patients with polymorphic VT including Torsades de pointes
 - **Magnesium** 2 grams IV slowly (over 10 minutes)

- Wide complex due to Tricyclic Antidepressant overdose, administer 1mEq/kg **Sodium Bicarbonate**, not to exceed 50mEq
- If suspicious for hyperkalemia administer **Calcium Chloride** 20mg/kg(1,000mg max dose), **Sodium Bicarbonate** 1mEq/kg and **Albuterol** 10mg via nebulizer
- If the patient remains hemodynamically and clinically stable, further treatment can be safely delayed until the patient arrives in the emergency department
- Prolonged QT, administer **Magnesium** 2 grams over 10 minutes

FOOTNOTES:

[1] Criteria for characterizing a patient as “unstable”

- Hemodynamic Criteria
 - SBP < 80 mmHg AND Heart Rate > 150 beats/min
- Clinical Criteria
 - Signs of shock (poor perfusion) are present, including
 - ALOC, including syncope
 - Absent radial pulses
 - Pallor and diaphoresis
 - Signs of pulmonary edema are present, including
 - Labored breathing
 - Rales (wet lungs)
 - Hypoxia (SpO₂ <94%)
 - The patient complains of angina

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2.34 NAUSEA, VERTIGO, VOMITING

Note:

- Think of potential causes
 - Infectious diseases
 - 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)
 - Vertigo
- Vertigo ranges from mild to severe – severe enough to become incapacitating and require EMS help.
- 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.
- Vertigo can occasionally be a symptom of stroke, but is most commonly a disturbance of spatial orientation and motion sense in the inner ear.
- Vertigo is commonly associated with nausea and vomiting

Priorities	Assessment Findings
Chief Complaint	Nausea and/or vomiting, vertigo
OPQRST	Onset, number of episodes of vomiting
Associated Symptoms/ Pertinent Negatives	Associated diarrhea? Bloody emesis or diarrhea?
SAMPLE	Recent travel, exposure to others with similar problem, contaminated food? Alcohol excess? Drugs or other toxins?
Initial Exam	ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO2 General: Ill appearing? Dehydrated? Abdomen: Soft? Tender? Distended? Neuro: ALOC?
Data	Blood sugar, SpO2, 12-Lead EKG
Goals of Therapy	Stop vomiting, relieve nausea, correct dehydration
Monitoring	Response to medications.

EMERGENCY MEDICAL RESPONDER

- Supportive Care
- Consider oxygen therapy with a nasal cannula if SpO₂ < 94%
- Do not use an oxygen mask if ALOC
- Have patient hold alcohol pad 2.5cm 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 yrs old, acquire 12-Lead EKG. If ***ACUTE MI SUSPECTED***, see Chest Pain *Guidelines*
- **Ondansetron (Zofran)** 4 mg ODT. May repeat x1 in 15 min. Pediatric dose [8-15kg] 2mg ODT.

PARAMEDIC

- IV 0.9% NS @ KVO
- Give a 500 ml bolus if signs of dehydration (increased heart rate) are present, check vitals and lung sounds before each bolus
- **Ondansetron (Zofran)** 4 mg IV/IM or ODT. May repeat x1 in 15 min. Pediatric 0.15 mg/kg max dose of 4mg.
- If extrapyramidal or dystonic, give **Diphenhydramine (Benadryl)** 50 mg IM or IV. Pediatric 1mg/kg max dose of 50mg.
- Evaluate for other causes of nausea and treat per guideline.

FOOTNOTES:

- Side effects include:
 - QT interval prolongation
 - Headache
 - Blurred vision
 - Dizziness
 - Fatigue
- Use with caution if patient is taking neuroleptic drug therapy. May increase chance of extrapyramidal effects
- Extrapyramidal effects include involuntary muscle spasms or repetitive movements

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2.36 PAIN MANAGEMENT

Priorities	Assessment Findings
Chief Complaint	"Pain"
OPQRST	Location, onset, provocation, palliation, quality, radiation, severity (subjective pain score on a 0-10 scale or mild moderate, severe), time (intermittent or continuous; steady vs. improving or worsening)
Associated Symptoms/ Pertinent Negatives	Trauma, swelling, discoloration, compare to other extremity CMS before and after splinting
SAMPLE	Allergies, medications, pertinent past history, last meal
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Writching in pain, facial grimacing, moaning, screaming or crying? Assess objectively how severe the pain appears to you (mild, moderate or severe). Skin: Pale, cool, diaphoretic? Source of pain (chest, abdomen, back, extremities, etc.): Swelling, ecchymosis or deformity? Tenderness on palpation? CMS?
Data	SpO ₂ . EKG for chest pain(refer to chest pain guideline)
Goals of Therapy	Reduce pain to a tolerable level shoot for half the pain number
Monitoring	BP, HR, RR, EKG, SpO ₂ .

EMERGENCY MEDICAL RESPONDER/EMT

- Display a calm and compassionate attitude
- Acknowledge and assess the patient's pain by obtaining a thorough history and rating
- Identify and treat the cause
 - Musculoskeletal injuries:
 - Realign angulated fractures, if possible, being cautious not to aggravate the injury or pain
 - Reposition (not reduce) dislocated joints to improve comfort, circulation, sensation, and motion
 - 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 found
 - Apply ice or cold packs to the injured area
 - Apply 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 unique extrication scenario:
 - Pad the backboard with a blanket(s)
 - Pad voids between the patient and backboard—behind knees, and small of back
 - Pad the straps
 - Keep the patient warm and protected from rain/snow, ambulance exhaust, etc.
- Check distal neurologic function, pulses, and capillary refill before and after splinting

- Reassure and comfort the patient; Use a calm and soothing voice
- Distract them or encourage them not to focus on their injury, but to think about something more pleasant
- 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
- Reassess pain after all interventions

PARAMEDIC

- IV 0.9% Normal Saline @ KVO
- Consider a bolus of 500 ml if signs of hypovolemia are present
- Reduce pain medication dose by 50% in elderly or smaller framed patients
- Consider **Ondansetron (Zofran)** 4 mg IV/IM or ODT. May repeat x1 in 15 min. Pediatric 0.15 mg/kg max dose 4mg.
- **Fentanyl Citrate** 100 mcg IV/IM/IO/IN repeat if needed in 5 minutes-max dose of 300 mcg. Pediatric dose 1mcg/kg IV/IO and 2mcg/kg IN max dose 100mcg per bolus
Or
- **Dilaudid** 1 mg IV/IO/IM, may repeat in 10 minutes-max dose 4 mg (Adults Only)
Or
- Consider low dose **Ketamine** for severe pain unresponsive to narcotics 0.25mg/kg IV/IM (max dose 25mg)
Or
- Consider high dose **Ketamine** for extreme pain dissociation 1-2mg/kg slow IV (max dose 200mg) or 4mg/kg IM (max dose 400mg) may repeat every 10 min
- For pediatric patients follow Broselow Tape or approved medical director product or app, if larger use half adult dose up to puberty.
- Reassess patient's pain before each additional dose.
- Recheck blood pressure before each additional dose; Dilaudid can cause hypotension. Fentanyl or Ketamine are preferred in hypotensive patient, hold Fentanyl, if SBP < 90 mmHg and preferentially use low dose Ketamine.
- For severe burn patients see Burn and RSA guidelines
- Do not withhold pain meds from someone in pain. Assessment at hospital can be done even after pain meds are given.

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Mercyhealth System
Medical Guidelines
2.38 RESPIRATORY DISTRESS

Note:

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

Priorities	Assessment Findings
Chief Complaint	“Difficulty breathing”; “Shortness of breath”
OPQRST	Assess onset, duration, progression, subjective severity, possible triggering events, and response to treatments before EMS arrival.
Associated Symptoms/ Pertinent Negatives	Chest pain (what kind?), fever/chills, productive (of what?) cough
SAMPLE	Check for possible exposure to known allergens. Check past history, medications and compliance for clues to cause of present illness.
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Tripod positioning; Purse-lipped breathing. Severity of distress [1]? Neck: JVD? Skin: Cool, moist and pale? Warm, dry and flushed? Urticaria? Cyanosis? Respiratory Effort: Using accessory muscles, signs of fatigue; two-word sentences? Lung Sounds: Wheezes, rales, rhonchi or stridor? Heart Sounds: Rate, regularity. Lower Extremities: Pitting edema of the ankles? Neuro: ALOC, lethargy, somnolence?
Data	EtCO ₂ with waveform, SpO ₂ , on room air or home O ₂ EKG, if an acute coronary syndrome is suspected 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

- Routine Medical Care or Routine Trauma Care
- Allow/assist the patient to assume a position of comfort (usually upright)
- Oxygen: Per nasal cannula at 2-6 LPM or per non-rebreather at 10-15 LPM (depending on the apparent severity)
- Assisted Ventilation: Consider assisting breathing with gentle synchronous ventilations with bag-valve mask (BVM); Support ventilation with BVM if apnea or hypopnea occurs
- If choking, clear airway
- If there is altered level of consciousness and loss of gag reflex, insert an oropharyngeal or nasopharyngeal airway
- If patient is unresponsive, utilize medical director approved non-visualized airway device
- If patient becomes responsive, remove advanced airway with patient in recovery position and suction ready
- If anaphylaxis is suspected, see *Anaphylaxis Guidelines*
- **Aspirin** is indicated for patients with angina, see *Chest Pain Guidelines*
- **Narcan** for suspected narcotic OD
- **Albuterol Sulfate** is indicated for Asthma and COPD, see *Asthma/COPD Guidelines*

EMT

- Monitor EtCO₂ (Capnography) to assess ventilatory status, confirm advanced airway placement and monitor treatment effectiveness, see *EtCO₂ (Capnography) Monitoring Procedure*
- Consider CPAP Refer to *CPAP Procedure*
- If patient is unresponsive, utilize medical director approved non-visualized airway device
- Consider the following medications
 - **Albuterol Sulfate** with **Ipratropium Bromide (Atrovent)** is indicated for Asthma and COPD, see *Asthma/COPD Guidelines*
 - **Aspirin** and assisting with patient's prescribed **Nitroglycerine** are indicated for patients with angina, see *Chest Pain Guidelines*

PARAMEDIC

- IV 0.9% NS @ KVO or saline lock
- Initiate a 500 ml fluid bolus, if hypotension or dehydration is present
- If patient is showing signs of CHF, see *CHF Guidelines*
- Confirm airway and effective ventilations with EtCO₂, print and look at waveform
 - In cardiopulmonary arrest, **do not interrupt compressions** to insert an endotracheal tube
- If a spontaneous tension pneumothorax is suspected, perform needle decompression on the affected side.
- Consider low dose **Ketamine** for severe CPAP anxiety 0.25mg/kg IV/IO/IM (max dose 25mg), **Fentanyl** 50-100mcg IV/IO/IN/IM, or **Versed** 2mg IV/IO/IN/IM may repeat every 10 min.
- Use Broselow tape or approved medical director product or app for correct pediatric drug doses.
- Non RSA intubations are restricted to patients with no gag reflex and need for airway management. Paramedics performing non RSA intubations should use the below guidelines for airway management, may not sedate or paralyze unless RSA credentialed.

Intubation

- Indications:
 - Severe respiratory distress or failure
 - Persistent hypoxia after high-flow O₂
 - Airway management in a combative patient
 - Altered mental status with need to protect/secure airway
 - Airway compromise
- Absolute Contraindications:
 - Known allergy to RSA medications(use available alternatives)
 - Suspected epiglottitis
- Relative Contraindications (intubation should be considered high risk and reserved for those with inability to be ventilated with other means):
 - Severe oral, mandibular, or anterior neck trauma
 - Anatomic abnormalities that increase the risk of failed intubation
 - Pediatrics and bariatrics
- Prepare:
 - Wide open flowing IV/IO (IM Medications have slower onset and are emergency backup only)
 - Organize equipment, functional suction, etCO₂ for waveform capnography, cardiac monitor, Bougie, video assist device, back up airway, and surgical airway
 - Select and prepare ET tube/stylet
 - Draw up RSA medications
 - Fluid bolus if hypotensive
 - If unresponsive to fluid bolus refer to section **5.42 Push Dose Pressors** to increase pre-intubation SBP>90
- Pre-Oxygenate:
 - Continuous SPO₂ and cardiac monitoring required
 - High-flow oxygen for 3-5 minutes prior to intubation or 8 vital capacity breaths
 - High flow oxygen should be provided via NC(15lpm) or NRB/BVM(25lpm)
 - Continuous high-flow oxygen via NC during entire procedure will reduce desaturation
 - If persistent hypoxia, consider using BVM with basic airway adjunct in addition to NC with PEEP valve attached to BVM.
 - Pre-oxygenation is not just about increasing O₂ sat but also allowing time for the nitrogen in the lungs to be replaced with Oxygen, also prolonging the period before desaturation.

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- Protect and Position:
 - Position the head and neck for intubation
 - Place towels behind the back of pediatric patients to improve visualization
 - Use towels blankets to ramp up bariatric patients to improve visualization
 - Manual c-spine stabilization in trauma patients
- Pre-paralysis Sedation/Induction (**2 RSA trained providers at bed side [2]**):
 - **Etomidate** 0.3mg/kg IV/IO(max dose 40mg)
Do not repeat any administration of **Etomidate** after initial sedation.
or
 - Give **Ketamine** 2 mg/kg IV/IO (max dose 200mg), or 4 mg/kg IM (max dose 400mg)
For patients with concern of cardiac ischemia, avoid **Ketamine**.
- Paralyze (**only after sufficient sedation/induction and 2 RSA trained providers at bed side [2]**):
 - **Succinylcholine Chloride (Anectine)** 2 mg/kg IV/IO/IM max 200 mg
 - **IM Succinylcholine has unreliable absorption and is only to be used in event of IV/IO failures**
 - Do not repeat dose for long term paralysis after intubation. If repeat dose of **Succinylcholine Chloride (Anectine)** is required for RSA, have **Atropine** available for bradycardia potential, use ACLS guidelines.
- Placement:
 - Insert the ETT until the cuff passes the vocal cords
 - Make only one (1) attempt [3]
 - If unsuccessful, proceed to the Difficult Airway Procedure below
 - Inflate the cuff
 - Immediately verify by viewing capnography waveform and print for verification
 - A waveform should be visible with each breath, if not assume intubation attempt was not successful
 - Auscultate bilateral breath sounds, negative gastric inflation, and equal chest rise
 - Check for condensation in the tube
 - Monitor SpO₂
 - Secure ET tube with commercial holding device, noting depth of tube placement
- Post-Intubation Management:
 - Secure ETT and place c-collar to reduce motion
 - Monitor vitals for tachycardia and hypertension, as the paralysis will outlast the sedation. Provide sedation and/or pain management per guideline.
 - **DO NOT** re-paralyze under the age of 5 yrs
 - Goal is to maintain SpO₂ 95-99% and etCO₂ 35-45mm Hg
 - Acidotic patients(DKA, ASA/TCA tox, severe sepsis, crush) etCO₂ goal is closer to 30mm Hg
 - Long acting paralytics should only be used on patients at risk or self-extubation or those requiring full muscle paralysis for effective ventilation. Repeat doses are not usually indicated.
 - **Vecuronium Bromide (Norcuron)** 0.1 mg/kg IV/IO max of 10 mg
or
Rocuronium Bromide (Zemuron) 1mg/kg IV/IO max of 100mg
 - Provide adequate sedation every 10 minutes as necessary. Long term paralysis may be unnecessary if adequately sedated and soft restraints utilized. Monitor vitals, as adjustment in sedation drugs may be necessary. If hypotensive, use **Ketamine(1-2mg/kg IV/IO max 200mg per bolus)** or **Fentanyl(1mcg/kg IV/IO max 100mcg per bolus)**. If possibility of ongoing seizures, or inadequate sedation with other agents use **Versed (0.1mg/kg IV/IO max 5mg per bolus)**.
 - If bradycardic, ensure adequate ventilation and recheck tube placement, see *Bradycardic Guidelines*
 - Place NG/OG for gastric decompression if trained
 - Services using ventilators will require ventilator specific training
 - Monitor closely for signs of pneumothorax
 - Utilize PEEP valve 5-10mm Hg if needed to maintain oxygen saturations, monitor blood pressure.

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- 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
 - Continue to monitor and re-assess the patient

- Difficult Airway Procedure
 - If rescuer cannot intubate the trachea after one attempt, a second attempt at intubation may be attempted. Ventilate between attempts. If the patient is unable to be ventilated or is hypoxic proceed directly to non-visualized airway. Utilize bougie, alternative visualization device, or additional bedside Paramedic to maximize chance of success.
 - **Failed Intubation:** If the second attempt to intubate is unsuccessful, proceed immediately to a non-visualized airway.
 - If the non-visualized airway fails consider the following options:
 - Let the succinylcholine wear off, while ventilating the patient with basic adjuncts
 - Consider a surgical airway bougie cricothyroidotomy[age>12], transtracheal jet ventilation, or Rüschi QuickTrach®

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] Minimum of two Paramedics or one Paramedic and one EMT that are current with all RSA education and skill requirements of the local EMS Medical Director. If a single Paramedic unit, attempt to request a second Paramedic unit to respond, but do not delay procedure if patient condition warrants immediate action.

[3] 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.

Mercyhealth System
Medical Guidelines
2.40 ROUTINE MEDICAL CARE

Priorities	Assessment Findings
Chief Complaint	Refer to specific guidelines for the kinds of chief complaints patients are likely to make.
OPQRST	Location, Onset, Provocation/Palliation, Quality, Radiation, Severity, Time (duration, progression) As an alternative: Use "Onset, Duration, Progression and Severity"
Associated Symptoms/ Pertinent Negatives	Associated Symptoms/Pertinent Negatives
SAMPLE	Allergies, Medications, Pertinent Past Medical History, Last Meal
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp,
Data	Follow specific guideline. Consider SpO ₂ , Blood Sugar, EKG
Goals of Therapy	Follow specific guideline.
Monitoring	Follow specific guideline.

EMERGENCY MEDICAL RESPONDER

- Scene size-up/Body-Substance Isolation (BSI)
- Obtain History
- Airway Management – Perform the following, if indicated:
 - Head tilt – chin lift
 - Oropharyngeal or nasopharyngeal airway or advanced airway if no gag reflex
 - Assist paramedics with endotracheal intubation
- Breathing Management – Perform the following, if indicated:
 - Check pulse oximetry (SpO₂)
 - Administer oxygen to keep SpO₂ > 94%
 - Use a nasal cannula at 2 – 6 LPM or Non-rebreather mask at 7 – 15 LPM
 - Ventilate or assist ventilations with a bag-valve-mask connected to high-flow oxygen
- Circulation Management – Perform the following, if indicated:
 - Control external hemorrhage with direct pressure, tourniquets, bandages, hemostatic gauze(non-exothermic)
 - Cardiopulmonary resuscitation (CCR) and Automated External Defibrillator (AED)
 - Place the patient in Trendelenburg Position; see *Hypovolemia & Shock Guidelines*
- After checking ABCs, correct any immediate life threats, if indicated:
 - Obstructed airway maneuvers and suction
 - Treat hypoglycemia per guideline
- Obtain Vital Signs
 - Blood Pressure (BP), Heart Rate (HR), Respiratory Rate (RR), and Pulse Oximetry (SpO₂). Temperature is optional. Use a digital thermometer, if available
- May administer Albuterol; See *Asthma/COPD Guidelines* and *Allergy & Anaphylaxis Guidelines*

EMT

- Perform a focused physical exam
- Airway Management – Perform the following, if indicated:
 - Non-visualized airway of correct size
- Breathing Management – Perform the following, if indicated:
 - May assist patient with prescribed Albuterol and Atrovent (or Combivent®) inhalers; see *Asthma/COPD Guidelines* and *Allergy & Anaphylaxis Guidelines*
 - May administer Albuterol and Atrovent Unit Doses; See *Asthma/COPD Guidelines* and *Allergy & Anaphylaxis Guidelines*
- Circulation Management – Perform the following, if indicated:
 - CPR
- After checking ABCs, correct any immediate life threats, if indicated:
 - May use Epinephrine auto injector for anaphylaxis; see *Allergy & Anaphylaxis Guidelines*
 - Check blood glucose if there is an altered level of consciousness (ALOC); see *Altered Level of Consciousness Guidelines* and *Diabetic Emergencies Guideline*
- Initiate additional EMT treatments as directed in specific guidelines

PARAMEDIC

- Airway Management – Perform the following, if indicated:
 - Same as for EMT
 - Endotracheal Intubation
- Breathing Management – Perform the following, if indicated:
 - Same as for EMT
- Circulation Management – Perform the following, if indicated:
 - Same as for EMT
 - Normal Saline or saline lock if immediate or anticipated fluid or medication need.
 - Intraosseous (EZ-IO) infusion and drug administration; see *EZ-IO Procedure*
 - If the patient is hypotensive, give a 250 ml Normal Saline bolus, repeat for SBP<90
- After checking ABCs, correct any immediate life threats, if indicated:
 - Dextrose for hypoglycemia; see *Diabetic Emergencies Guideline*
- Initiate additional treatments as directed in specific guidelines
- Airway Management – Perform the following, if indicated:
 - Perform a cricothyroidotomy (surgical/needle) if an upper airway obstruction cannot be relieved by non-invasive means
 - RSA; see *Respiratory Distress Guidelines*
- Breathing Management – Perform the following, if indicated:
 - Needle decompression of a tension pneumothorax; see *Respiratory Distress Guidelines*
- Circulation Management
 - Initiate an IV at an indwelling central line port; see *Central Line Use Procedure*
- Alternate EZ-IO Sites; see *EZ-IO Procedure*
- Hemorrhagic Shock
(Use of tourniquet, sustained tachycardia despite pain control/sedation, clinical signs/symptoms of shock such as altered mental status, pale skin, or suspected internal bleeding.)
 - Over 12 years old: **TXA** 2 Grams IV/IO over 20 minutes for SBP < 90 mm Hg or heart rate > 110 beats per minute. Hang blood tubing.
 - Under 12 years old: **TXA** 30mg/kg(maximum dose 2 Grams) IV/IO over 20 minutes for unstable age based vital signs (less than 80 mm Hg younger than 5, less than 90 mm Hg 5 years and older). Hang blood tubing.

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- 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.
- After checking ABCs, correct any immediate life threats, if indicated:
 - Synchronized Cardioversion in unstable patients; see *Wide Complex Tachycardia Guidelines* and *Narrow Complex Tachycardia Guidelines*
 - Transcutaneous Pacing in unstable patients; see *Bradycardia Guidelines* and *Cardiac Arrest Guidelines*
- Initiate additional Paramedic treatments as directed in specific guidelines

Mercyhealth System
Medical Guidelines
2.42 ROUTINE TRAUMA CARE

Note:

- This guideline may be used as a general guide for trauma in both Adults and Pediatrics. Follow appropriate guideline and/or procedure for specific trauma care
- Do not delay transport and perform advanced skills during transport as able

Priorities	Assessment Findings
Chief Complaint	Various depending on incident.
OPQRST	Identify specific cause of traumatic injury
Associated Symptoms/ Pertinent Negatives	Significant mechanism, loss or altered level of consciousness. Evidence of intoxicant use.
SAMPLE	Identify medical conditions that may have led to the event (e.g. Alzheimer's, CVA, Diabetes, Seizures)
Initial Exam – Rapid Trauma Assessment	Check ABC's and correct any immediate life threats. Manual C-spine stabilization. Perform rapid trauma assessment as appropriate.
Detailed Focused Exam	Vitals: BP, HR, RR, Temp, SpO ₂ General Appearance: Unresponsive, pale, diaphoretic? Signs of trauma? HEENT: PERRL? Pupils constricted or dilated? Discharge from ears or nose? Lungs: Signs of respiratory distress, hypoventilation, diminished or absent lung sounds? Heart: Rate and rhythm? Signs of hypoperfusion? Neuro: Loss of movement and/or sensation in extremities, Unresponsive? Focal deficits?
Data	Blood Glucose, SpO ₂ , EKG, EtCO ₂
Goals of Therapy	Maintain ABC's, restore adequate respiratory and circulatory conditions, reduce pain
Monitoring	SpO ₂ , Cardiac monitoring, EtCO ₂ , repeat vitals

EMERGENCY MEDICAL RESPONDER

- Ensure "**Scene Safety**" and Body Substance Isolation (BSI)
- Determine need for additional resources for extrication and transport
- Airway: Relieve airway obstruction, if present
 - Attempt to open the airway with a jaw-thrust first, if that fails use head tilt – chin lift carefully
 - Remove foreign material, emesis and blood, suction as needed
 - Consider oropharyngeal airway or nasopharyngeal airway (use caution in facial trauma)
- Oxygen
 - 2-4 LPM per nasal cannula or
 - High-flow oxygen 10-15 LPM by non-rebreather mask to maintain SpO₂ > 94%
- Breathing:
 - Assist ventilations with bag-valve-mask and high-flow oxygen, as needed
 - Consider a non-visualized advanced airway, if unresponsive without gag reflex and trained to perform
 - Cover sucking chest wounds with a medical director approved commercial chest seal or an occlusive dressing (Vaseline gauze, defibrillator pad), seal all 4 sides of dressing, lift as needed to vent any developing tension pneumothorax

- Circulation:
 - Control major external hemorrhage with direct pressure, tourniquet to quickly control life threatening arterial bleeding, hemostatic gauze(non-exothermic)
 - If the patient arrests,
 - Re-assess the airway and oxygen delivery
 - Consider initiating the *Cardiac Arrest Guidelines*
 - Prolonged efforts to restore spontaneous circulation in a traumatic arrest should not be made, unless
 - It is due to a penetrating injury
 - The initial rhythm is shockable
 - CPR should not be attempted if:
 - There are other injured survivors with urgent needs for help
 - Obvious signs of death
- C-Spine: Manual stabilization, c-collar
- Refer to *Pain Management Guidelines*
- If there is ALOC
 - Check Blood Glucose
 - Follow *Diabetic Emergencies Guideline* if < 70
- Amputation care
 - Control bleeding
 - Find and bring all amputated parts to hospital with patient
 - Wrap in moist sterile dressings and place in waterproof bag
 - Place waterproof bag on ice or cold packs
- Avulsions/Degloving
 - Do not replace flap or loose skin, handle gently
 - Dress with saline soaked sterile dressings
 - Apply direct pressure to control bleeding
- Crush Injuries with gloves or shoes on
 - Leave gloves or shoes on unless actively hemorrhaging and direct wound care is necessary
- Eviscerations
 - Do not place organs back into body
 - Dress in saline soaked sterile dressings
- Impaled Objects
 - Do not remove, it is likely slowing the bleeding
 - Secure with bulky dressings
- Eye foreign bodies
 - Copiously irrigate both eyes with sterile water or saline.

EMT

- Monitor ventilations with capnography, assist with BVM to maintain normal EtCO₂
- Suction the airway
- Cover sucking chest wounds with a medical director approved commercial chest seal or an occlusive dressing(Vaseline gauze, defibrillator pad), seal all 4 sides of dressing, lift as needed to vent any developing tension pneumothorax
- Splint obvious extremity fractures and use pelvic wrap or binder for crepitus on exam/suspected pelvic fracture

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- Selective Spinal Immobilization – In the presence of a mechanism of injury for spinal trauma:
 - Cervical collar application is optional if there is no:
 - complaint of neck pain or tenderness on exam
 - numbness, tingling or weakness in any extremity
 - distracting injury
 - evidence of alcohol or drug intoxication
 - major trauma to the head or face
 - history of loss of consciousness
 - altered level of consciousness on exam
 - If all the above criteria are met, have patient move their neck 45° to either side of midline, flex, and extend neck, and if still no pain, no immobilization is indicated.
 - Document exam findings.
 - Cervical collar only should be used for spinal immobilization.
 - Long board should only be used for extrication or short-term patient movement. Long board is not an immobilization device. Use alternative patient movement devices such as sheets or carriers to move.
 - Only remove a C-collar that has already been applied, if you need to examine the neck or the application is causing more harm than good and they meet the above criteria
 - Ambulatory patients should have c-collar placed if indicated, and be put on cot as soon as possible. They should not ambulated for significant distances

PARAMEDIC

- IV (18ga or larger) 0.9% Normal Saline @ KVO or an appropriate bolus of 500ml (Adult) or 20 ml/kg (Peds), or saline lock.
- If multiple boluses needed, use Lactated Ringers as preferred solution.
- In hemorrhaging adult patients without closed head injury, practice permissive hypotension and maintain SBP of 90mmHg.
- In hemorrhaging adult patients with closed head injury maintain SPB>100mmHg.
- Consider 2nd IV.
- Maintain age based normal SBP in pediatrics.
- If available hang blood tubing with Normal Saline to expedite transfusion upon arrival to hospital.
- If the airway is obstructed or obstruction is imminent and 2 attempts to intubate the trachea have failed, perform surgical or needle cricothyroidotomy
- Bilateral needle decompression, pelvic binder, and pericardiocentesis for traumatic arrest
- Consider gastric decompression with oral or nasogastric tube, unless contraindicated by facial trauma or skull fracture
- Consider external jugular (EJ) IV if one cannot be established in the extremities
- Consider intraosseous (EZ-IO) access if an EJ cannot be established
- Treat pain per pain guideline
- Consider sedation for combative patients, refer to *Agitated & Combative Guidelines*

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Consider RSA in trauma patients with the following indications:

- Respiratory failure with hypoventilation or persistent hypoxia on 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
- Flail chest
- Sucking chest wound
 - Cover with occlusive dressing
- Tension pneumothorax
 - Needle decompression of effected side
- Threat of imminent airway compromise:
 - Massive facial injuries
 - Hemorrhaging into or around the airway
 - Expanding neck hematoma or Penetrating injuries of the neck
- Hemorrhagic Shock

(Use of tourniquet, sustained tachycardia despite pain control/sedation, clinical signs/symptoms of shock such as altered mental status, pale skin, or suspected internal bleeding.)

 - Over 12 years old: **TXA** 2 Grams IV/IO over 20 minutes for SBP < 90 mm Hg or heart rate > 110 beats per minute. Hang blood tubing.
 - Under 12 years old: **TXA** 30mg/kg(maximum dose 2 Grams) IV/IO over 20 minutes for unstable age based vital signs (less than 80 mm Hg younger than 5, less than 90 mm Hg 5 years and older). Hang blood tubing.
 - 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.
- 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 Grams IV/IO over 20 minutes
- Under 12 years old: **TXA** 30mg/kg(maximum dose 2 Grams) IV/IO over 20 minutes Adult Crush injuries greater than 1 hour assume hyperkalemia and treat
 - Calcium Chloride and Sodium Bicarbonate are not compatible
 - Add 50meq **Sodium Bicarbonate** per liter of NS and initiate 500ml/hr infusion and give 1 liter bolus of this fluid just prior to extrication
 - Consider **Calcium Chloride** 20mg/kg(max 1,000mg bolus) and 1meq/kg **Sodium Bicarbonate**(max 50meq bolus) slow IV/IO for peaked T-waves, widened QRS, or ventricular irritability
 - **Albuterol** 10mg via nebulizer
- Pediatric Crush injuries greater than 1 hour assume hyperkalemia and treat
 - Calcium Chloride and Sodium Bicarbonate are not compatible
 - Pediatrics use 1meq/kg **Sodium Bicarbonate** in the NS infusion, infuse at
 - 10kg: 4ml/kg/hr
 - 10-20kg: 40ml/hr plus 2ml/kg/hr for each kg between 10-20kg
 - >20kg: 60ml/hr plus 1ml/kg/hr for each kg above 20kg
 - Bolus at 20ml/kg just prior to extrication
 - Consider **Calcium Chloride** 20mg/kg(max 500mg bolus) and 1meq/kg **Sodium Bicarbonate**(max 50meq bolus) slow IV/IO for peaked T-waves, widened QRS, or ventricular irritability
 - **Albuterol** less than 1 year old 2.5mg, older than 1 year old 5mg via nebulizer
- Eye injuries:
 - **Tetracaine** 2gtts/eye may repeat every 5-10 minutes, max 3 doses
 - Irrigate both eyes copiously with sterile water or saline
 - Coach patient not to rub eyes

This page updated 1/10/22

FOOTNOTES:

[1] Indications for spinal immobilization:

- Significant mechanism of injury (MOI) without neck pain or neurologic deficit (numbness or tingling in extremities)
- Trauma patient complains of neck pain or neurologic deficit (numbness or tingling in extremities)
- Trauma patient has altered level of consciousness (from medical condition or drug use)
- Trauma patient significant distracting injury

Mercyhealth System
Medical Guidelines
2.44 SEIZURE

Note:

- Seizures usually last from 1-3 minutes and involve a loss of consciousness and convulsions. Not uncommonly, the patient is incontinent and may bite his tongue or is injured in other ways because of the convulsions.
- When the seizure is over, the patient enters a postictal state, characterized by a gradual return to full consciousness over about 20 – 30 minutes, with initial confusion eventually giving way to normal alertness and orientation.
- Whenever seizures occur, look for an underlying cause and treat it. This is especially important if there is no previous history of epilepsy.
- Febrile Seizure is defined as a seizure with a fever >100.4 °F rectal in a child 6mos-6yrs
- If the patient is more than 20 weeks pregnant, refer to the *Eclampsia Guidelines*.
- Status epilepticus is defined as a seizure lasting longer than 5 minutes, frequently recurring seizures without return to baseline neurological status, or repeated seizures for 30 minutes. This is a life-threatening emergency!
- Pseudoseizures look like seizures, but are actually a behavioral disturbance characterized by intermittent spells of non-epileptic convulsions that are usually involuntary. They are frequently misdiagnosed as epilepsy and often treated with anti-epilepsy drugs for a long time, before the true nature of the attacks is revealed. Careful assessment may reveal telltale clues [2].

Priorities	Assessment Findings
Chief Complaint	“Seizure” “Unresponsive” “Convulsions”
OPQRST	How long did it last? History of seizures? Fever? Possible contributing factors [1]
Associated Symptoms/ Pertinent Negatives	Unresponsive, Postictal, Incontinent
SAMPLE	History of seizures, Seizure medications?
Initial Exam	ABC’s and correct any immediate life threats
Detailed Focused Exam	Scene size-up: Is there a significant mechanism of injury? General Appearance: Pt. currently seizing? Unresponsive? Postictal? Vitals: BP, HR, RR, Temp, SpO ₂ Skin: Flushed, warm Neuro: ALOC?, Focal deficits (CVA)
Data	Blood Glucose, SpO ₂ , Temperature
Goals of Therapy	Stop the seizure Treat the underline cause Monitor and maintain airway.
Monitoring	Vitals, Cardiac monitoring, SpO ₂

EMERGENCY MEDICAL RESPONDER/EMT

- Routine medical care
- Protect the patient with ongoing seizures from harming themselves by clearing away potential hazards and placing a pillow or padding under the head
- Oxygen 2-4 LPM per nasal cannula, to keep SpO₂ ≥ 94%
- Consider Non-rebreather mask if necessary 10-15 LPM
- Obtain blood glucose. If < 70 refer to *Diabetic Emergencies Guideline*
- Consider oropharyngeal or nasopharyngeal airway, if the patient is unable to maintain a patent airway

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PARAMEDIC

- IV 0.9% NS @ KVO or saline lock
- If the patient is still seizing, give **Versed** 0.1mg/kg IV/IO/IN(max 5mg bolus) or 0.2mg/kg IM(max 10mg bolus)
- If seizures persist, repeat doses of Versed every 5 min until seizures stop. Maximum total dose: **Versed** 20mg unless medical control orders additional doses
- If there is need for RSA to control airway, only short acting paralytics should be used. Once the patient is paralyzed, muscular convulsions will cease, but occult CNS seizure activity may persist. Therefore, you must repeat doses of **Versed** every 5 minutes under the assumption of ongoing seizure activity while maintaining stable vitals.

FOOTNOTES:

[1] The causes of seizures include: fever in children up to about 6 yrs, epilepsy, eclampsia, hypoglycemia, hypoxia, drug or alcohol withdrawal, drug overdose, stroke and head trauma

[2] Characteristics of pseudoseizures 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 a real seizure)
- Lack of tongue biting or incontinence
- Apparent purposeful movements
- Remaining consciousness, or even speaking, during the convulsion

Medical Guidelines

2.46 STROKE

Priorities	Assessment Findings
Chief Complaint	“Weakness”, “Confusion”, “Slurred Speech”, “Unresponsive” G-F-A-S-T (Gaze, Facial droop, Arm drift, Speech difficulties, Time symptoms started)
OPQRST	Last known well time? Was it witnessed?
Associated Symptoms/ Pertinent Negatives	Headache, weakness, pupil dilation, slurred speech, aphasia, incontinent
SAMPLE	Medication consistent with history of stroke or TIA
Initial Exam	ABC’s and correct any immediate life threats
Detailed Focused Exam	Vital signs: BP, HR, RR, Temp, SpO2 General Appearance: Unresponsive?, noticeable facial droop, drooling, slouched posture Neuro: GFAST
Data	Blood Glucose
Goals of Therapy	Maintain ABC’s and adequate vital signs
Monitoring	12 lead EKG Heart rate and blood pressure

EMERGENCY MEDICAL RESPONDER/EMT

- Routine medical care
- Oxygen 2-4 LMP per nasal cannula, keep SpO₂ ≥ 94%
- If blood glucose < 70 follow *Diabetic Emergencies Guideline*.
- NPO
- GFAST stroke scale every 15 minutes or if any neurologic changes
- Head of Bed(HOB) at 30 degrees
- GFAST
 - Gaze 2 points
 - Facial Droop 1 point
 - Arm Drift 1 point
 - Speech Difficulties 1 point
 - Time last known well Not scored
- Any score greater than 0 is a positive GFAST stroke scale.
- Those scoring 3 or more on the GFAST stroke scale should preferentially be taken to a thrombectomy capable center if the diversion time from acute stroke ready or primary stroke center is less than 30 minutes and additional transport time will not disqualify for thrombolytics.

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PARAMEDIC

- IV/IO 0.9% NS @ KVO or saline lock, large bore(20g or larger) in AC is preferred
- Consider RSA; refer to *Respiratory Distress Guidelines*
- Notify Medical Control ASAP of results of GFAST Stroke Scale

Elevated BP may be providing neurologic protection in some stroke patients. The below guidelines are only for patients where an infusion of tPA has been started in the hospital and you are transferring someone on a tPA infusion.

Verify total dose given or to be infused with sending facility. Document total tPA dose to be administered, start and stop times; if tubing change required for EMS IV Pump, assure correct dose of tPA is included. Following tPA administration begin 0.9% NS infusion at existing rate; no other medications may be administered via tPA infusion line.

- Monitor vitals and neuro exam every 5 min, document in EMS chart and hospital forms if provided
- BP Guidelines: If SBP>180 or DBP>105, or BP management medications started at sending facility:
 - Labetalol drip: may increase 1-2mg/min every 10 minutes to max dose of 8mg/min, with a maximum total dose of 300mg, until SBP<180 or DBP<105. If SBP<140 or DPB<80 or HR<60, discontinue infusion and contact medical control.
 - Nicardipine drip: may increase dose by 2.5mg/hr every 5 min to max dose of 15mg/hr until SBP<180 and DBP<105. If SBP<140 or DBP<80 or HR<60, discontinue infusion and contact medical control.
 - Other: Discuss with medical control and sending facility to assure understanding of all medications to be infused enroute.
- BP Guidelines: If SBP>180 or DBP>105, BP management medications not started at sending facility:
 - **Labetalol** 10mg IVP over 2 min, if no effect, may repeat 20mg IVP in 10 min to a max of 100mg.
 - If Labetalol not available, **Metoprolol** 5mg IVP, repeat every 5 min to max of 15mg.
 - For either medication hold if SBP<140 or DBP<80 or HR<60.
- Changes in neurologic condition(Develops severe headache, acute hypertension and/or bradycardia, nausea, or vomiting)
 - Discontinue tPA
 - Contact medical control
- Oropharyngeal edema:
 - Stop tPA
 - Treat according to allergic reaction guideline
 - Contact medical control

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Pre-Hospital Stroke Checklist

Stroke Alert Criteria	Yes	No
Last known well time < 24 hours?		
Any abnormal findings on examinations?		
Blood glucose >50?		
If all above are Yes, call Primary Stroke Center with a <u>Code Stroke</u>		

Minimum information for ED radio report to call Code Stroke

Time of Onset or Last Time Seen Without Signs/Symptoms:				
Level of Consciousness (AVPU):	A	V	P	U
GFAST: Those scoring 3 or more should preferentially be transported to thrombectomy capable center				
Gaze	2			
Facial Droop (show teeth or smile)	1			
Arm Drift (close eyes and hold out both arms)	1			
Speech Difficulties	1			
Time last known well	Not scored			
Blood Glucose Level:				
History of Present Illness Includes:	Yes	No		
Sudden weakness on one side of body (arm, leg, face)?				
Severe headache?				
Sudden difficulty speaking or understanding what is said?				
Seizure at onset?				
Head trauma or fall at onset?				

Additional information needed at ED

Date:			
Patient Name:			
Age:			
Witness Name:			
Witness Phone #			
Vital Signs:	Pulse _____	BP _____	RR _____ SP02 _____
Past Medical History:	Yes	No	
Stroke or TIA?			
Diabetes?			
Hypertension?			
Recent Surgery?			
Heart Attack?			
Current Medications:	Yes	No	Last Dose
Aspirin?			
Coumadin?			
Plavix?			
Aggrenox?			
Other agents?			

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Mercyhealth System
Medical Guidelines
2.48 SUBMERSION

Notes:

- RESCUER SAFETY IS #1. Many well-intentioned volunteer and professional rescuers have been injured or killed attempting to save a drowning victim.
- If the victim is still in the water dispatch local water rescue resources
- Submersion is a loss of consciousness under water
- Submersion is primarily a respiratory problem
- When delivering ventilations and chest compressions assume the patient will vomit. Be prepared to suction. Secure the patient's airway as soon as possible.
- Any patient successfully resuscitated after a loss of consciousness underwater 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 complaints warrant a full medical evaluation.
- Increasing submersion duration is associated with worse outcomes regardless of water temperature. Submersion durations <5min are associated with favorable outcomes, while those >30min are associated with poor outcomes and the incident commander should consult with the EMS medical director to make a risk vs benefit analysis when determining rescue vs. recovery.

Priorities	Assessment Findings
Chief Complaint	"Drowning", "Near Drowning"
OPQRST	Onset. Duration of time under water. Water temperature, if known. Bystander CPR performed? AED Used?
Associated Symptoms/ Pertinent Negatives	Alcohol involved? Trauma involved?
SAMPLE	Allergies? Medications?
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: lifeless Skin: pale, cool, mottled Lungs: wet or clear? Heart: Rate and regularity? Absent heart sounds? Neuro: Unresponsive?
Data	Blood sugar, EKG, SpO ₂ .
Goals of Therapy	Return of spontaneous circulation (ROSC)
Monitoring	BP, HR, RR, EKG, SpO ₂ .

EMERGENCY MEDICAL RESPONDER

- Routine C-spine stabilization of all submersion patients is not indicated
- When a mechanism of injury (e.g. diving accidents), or obvious signs of trauma, is present:
 - C-spine stabilization is indicated
 - Open the airway with a jaw-thrust maneuver
 - Ventilate the patient while maintaining C-spine stabilization
 - Remove the patient from the water on a long-spine board
- Always assume that hypothermia is present and follow the *Hypothermia & Frostbite Guidelines*
- All drowning/near drowning patients are to be transported

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- If the patient is pulseless and not breathing, follow the *Cardiac Arrest Guidelines*
 - Remove the patient from standing water
 - Dry the chest
 - Attach an AED
- If an upper airway obstruction is suspected follow *American Heart Association Guidelines*
 - Routine use of abdominal thrusts and back blows is not indicated in submersions
- Check blood glucose, if hypoglycemia is suspected
 - Follow *Diabetic Emergencies Guideline* if the blood glucose is < 70
- Place oral or nasal airway if tolerated. Advanced airway if no gag reflex.

EMT

- 12 lead EKG if indicated
- Monitor EtCO2

PARAMEDIC

- IV Normal Saline @ KVO or saline lock
- If hypotension is suspected, initiate a Normal Saline Bolus of 500 ml
- Warm the IV fluids and run at 250 ml/hr according to the *Hypothermia & Frostbite Guidelines*
- If Hypoglycemia is present, follow *Diabetic Emergencies Guideline*
- If a narcotic overdose is suspected, follow the *Toxic Exposure/Overdose Guidelines*
- Consider endotracheal intubation

FOOTNOTES:

- Adult Respiratory Distress Syndrome (ARDS) is very common in a near drowning victim. The onset is slow, but can be life threatening. Monitor ventilation status (SPO2, EtCO2 and lung sounds) often

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Mercyhealth System
Medical Guidelines
2.50 SYNCOPE

Note:

- Common causes of syncope include dehydration and vasovagal reflexes; less commonly syncope may result from arrhythmias and stroke
- Syncope and seizures both result in loss of consciousness. Both may occur with or without convulsions. In syncope, the convulsions are brief. Unlike seizures, in syncope the patient regains consciousness quickly and without the usual postictal confusion.

Priorities	Assessment Findings
Chief Complaint	“Passed Out”; “Fainted”
OPQRST	Determine onset, duration and triggering events (e.g., fright, defecation, micturition)
Associated Symptoms/ Pertinent Negatives	Headache, dizziness, confusion, vomiting, diarrhea, dehydration, incontinence, seizure, lack of food or water
SAMPLE	Exposure to known allergen. History of heart disease or stroke. Current or past medication for these problems. Compliance with these medications recently.
Initial Exam	Check ABCs and correct any immediately life threatening problems. Consider trauma and c-spine.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO2 General Appearance: may be normal or ill appearing Skin: Pale, cool, diaphoretic Heart: Hypotension, tachycardia, weak pulses, poor capillary refill? Neuro: May be A&OX3; ALOC? Focal deficits, signs of trauma due to falling?
Data	Blood glucose. EKG
Goals of Therapy	Treat symptomatic bradycardia/hypotension.
Monitoring	Cardiac Rhythm monitoring Heart rate and blood pressure

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care
- Gently lower the patient to a supine position or Trendelenburg position if hypotensive.
- Oxygen 2-4 LPM via nasal cannula; Maintain SpO2 \geq 94%
- Check blood sugar if less than 70 treat per *Diabetic Emergencies Guideline*

EMT

- Obtain 12 lead EKG

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PARAMEDIC

- Initiate IV 0.9%NS @ KVO
- If patient is hypotensive, or shows signs of dehydration (rapid heart rate) administer 500ml fluid bolus as long as lung sounds are clear
- If still sinus bradycardia with a HR <40, follow bradycardia guideline
- If altered LOC or hemodynamically unstable, initiate transcutaneous pacing
- Consider pain management for transcutaneous pacing including **Fentanyl Citrate** 100mcg IV/IO/IN/IM if **SBP >80mmHg**, or **Midazolam (Versed)** 2mg IV/IO/IN/IM if **SBP >100mmHg**(reduce dose by 50% for smaller framed and elderly)

Mercyhealth System
Medical Guidelines
2.52 TOXIC EXPOSURE/OVERDOSE

Note:

- Perform scene size-up and ensure crew safety. In a hazardous materials incident, stage up wind of the incident, and do not attempt to treat any patients who have not been decontaminated. Be especially suspicious of scenes in which many people or animals appear to be affected. Refer to Bronstein and Currance *Emergency Care for Hazardous Materials Exposures*, 2nd Edition
- Beware of the potential for the patient to vomit spontaneously. Following any form of cyanide ingestion, emesis may off-gas toxic hydrogen cyanide, placing rescuers at risk.
- Beware of the potential for seizures or altered level of consciousness due to toxic exposures.
- Beware of the potential for cardiovascular collapse and respiratory compromise due to toxic exposures.

Priorities	Assessment Findings
Chief Complaint	"Overdose" "Exposure to chemicals" "Unresponsive"
OPQRST	Determine time of exposure/ingestion, Determine amount/length of exposure
Associated Symptoms/ Pertinent Negatives	Dyspnea, nausea/vomiting, abdominal pain, unresponsive; Suicidal ideation or suicide attempt. Accidental or intentional exposure.
SAMPLE	Psychiatric history and medications, exposure to chemicals
Initial Exam	Check ABC's, and correct any immediate life threats
Detailed Focused Exam	Vitals: BP, HR, RR, Temp, SpO ₂ General Appearance: level of alertness, signs of agitation, willingness to cooperate with authorities Skin: Cool, pale and diaphoretic? Warm, dry and flushed? HEENT: Are the pupils constricted or dilated? Nystagmus? Lungs: Wheezes, rales or rhonchi? Heart: Rate, regularity, BP, peripheral perfusion? Neuro: Signs of intoxication? Ataxia? Slurred speech? Psych: Depressed affect? Bizarre thoughts? Signs of suicidal ideation or intent?
Data	Blood glucose, Identify possible toxic substances ingested/exposed too.
Goals of Therapy	Reduce amount of substance absorbed into the body; Treat with antidotes if possible; Correct toxic effects on the CNS, cardiovascular and respiratory systems.
Monitoring	Cardiac monitoring, EtCO ₂

EMERGENCY MEDICAL RESPONDER/EMT

- Routine medical care
- Oxygen @ 2-4 LPM per nasal cannula to keep SpO₂ ≥ 94%. Increase flow or convert to non-rebreather mask as needed.
- If the patient is unconscious, place him/her in the recovery position. Follow the ALOC Guidelines
- Consider use of a non-visualized airway.
- If the patient is unconscious, check blood glucose. If < 70, follow the *Diabetic Emergencies Guideline*
- 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 the patient is exposed to, or their personal carbon monoxide levels, all symptomatic patients shall be transported for formal evaluation.
- Treat with high-flow oxygen therapy regardless of SpO₂ reading
- Any patient in a confined space with combustion products or with history of exposure to cyanide should be treated with high flow oxygen therapy.
- Address all other issues with appropriate guidelines
- If opiate overdose, **Narcan** 0.5-2mg IN or IM(EMT only) to support respirations

PARAMEDIC

- IV 0.9% NS @ KVO or saline lock
- Initiate a bolus of 500 ml Normal Saline, if the patient is hypotensive or tachycardic.
- If the patient has an altered level of consciousness and a narcotic overdose is suspected, consider **Naloxone (Narcan)** 0.5 -2mg IV/IO/IN/IM. Using smaller doses of Narcan is recommended, as the goal is only to increase respirations, not fully awaken patient. If there is no response to Narcan, consider an alternative explanation or contact medical control.
- Carbon monoxide and cyanide exposure should be treated with high flow oxygen regardless of SpO₂
- Cyanide exposure should be treated with a cyanide treatment kit per manufacturer's instructions.
 - **Cyanokit (hydroxocobalamin)** 5 grams(Pediatric dose 70mg/kg) over 15 minutes.
 - **Cyanide kit** per manufacturer's directions.
- Cyanide treatment kit may need to be given a second time if patient remains in extremis
- See drug class guidance below:

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<i>Class of drugs</i>	<i>Treatment Indications</i>	<i>Specific Treatment(s)</i>
Amphetamines	Agitation, psychosis, or ventricular arrhythmias Caveat: For patients with Excited Delirium, refer to the <i>Agitated & Combative Patients Guideline</i> .	PARAMEDIC may consider the following medications for sedation or seizures: Versed 0.1mg/kg IV/IO/IN(max 5mg bolus) or 0.2mg/kg IM(max 10mg bolus)
Benzodiazepines (BZD) [1]	Treat signs and symptoms. Caveat: Pure benzodiazepine overdoses are rarely life-threatening.	Treat arrhythmias according to the appropriate guideline. Treat seizures according to the <i>Seizure Guidelines</i>
Beta Blockers	Profound bradycardia, hypotension or conduction defects	PARAMEDIC consider Glucagon 2 mg slow IVP for adults and 0.1mg/kg pediatrics. May repeat every 3 min up to 5 mg total for adults and 3mg total for pediatrics
Calcium Channel Blockers	Profound bradycardia, hypotension or conduction defects	PARAMEDIC consider Calcium Chloride 10% 1000mg (10 ml) IV/IO over 10 minutes for adults and 20mg/kg slow IVP for pediatrics. Consider Glucagon 2 mg slow IVP for adults and 0.1mg/kg pediatrics. May repeat every 3 min up to 5 mg total for adults and 3mg total for pediatrics
Cocaine	Agitation, seizures, or ventricular arrhythmias Caveat: For patients with Excited Delirium, refer to the <i>Agitated & Combative Patients Guideline</i>	PARAMEDIC may consider the following medication: Versed 0.1mg/kg IV/IO/IN(max 5mg bolus) or 0.2mg/kg IM(max 10mg bolus) Sodium Bicarbonate 1 mEq/kg up to 50mEq may also be given if a wide QRS is noted May repeat once. Contact Medical Control.

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Narcotics [1]	Narcan may be used in cases of oversedation due to narcotic administration, or in suspected narcotics overdoses in patients without a history of long-term use, chronic abuse or addiction. Signs of narcotic overdose or oversedation include: decreased level of consciousness, pinpoint pupils (except Demerol), and respiratory depression. Caveat: Giving Narcan to a long-term narcotic user, chronic abuser or addict can induce narcotic withdrawal, which creates a new set of difficult problems.	In the setting of an intentional overdose, if the patient has ALOC – with or without a gag reflex, or shows signs of respiratory depression, airway management takes precedence over reversing the overdose with Narcan. PARAMEDIC consider RSA and withholding Narcan. Naloxone (Narcan) 0.5mg up to 2mg IV/IO/IN/IM (Pediatric 0.1mg/kg) until the patient reaches normal respiratory pattern.
Organophosphate Poisoning (Pesticides and Nerve Agents)	Profound bradycardia, seizures, abnormal (wet) lung sounds The organophosphate toxidrome: S – Salivation, Seizures L – Lacrimation U – Urination G – GI vomiting and diarrhea B – Bradycardia*, bronchorrhea, bronchospasm A – Arrhythmias M – Miosis (small pupils)* * Tachycardia and mydriasis (dilated pupils) are also possible Caveat: Organophosphates are highly toxic in very small quantities and pose a significant risk to EMS.	PARAMEDIC Atropine Sulfate 2mg IV/IO every 3-5 min until lung sounds clear to auscultation. Use atropine in the initial treatment of Bradycardia and seizures. Contact Medical Control. If seizures develop Versed 0.1mg/kg IV/IO/IN(max 5mg bolus) or 0.2mg/kg IM(max 10mg bolus) For rescuers who inadvertently enter a vapor cloud of organophosphate (e.g. nerve agents), self-administer 1 – 2 Mark I Kits and evacuate yourselves from the scene immediately.
Tricyclic Antidepressants (TCA)	Decreased level of consciousness; hypotension, seizures, malignant arrhythmias (e.g. <i>Torsades de Pointes</i> , VT), prolongation of the QT or QRS intervals. Caveat: Patients with TCA overdoses are prone to deteriorating very quickly. 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 protect 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 <i>Seizure Guidelines</i> PARAMEDIC Sodium Bicarbonate 8.4% 50meq (50ml) IV bolus for adults and 1mEq/kg for pediatrics. Repeat as directed by medical control. For long transports, consider a Sodium Bicarbonate drip with 3 amps in a liter of NS @ 250 ml/hr after the initial boluses are in. Consider RSA and hyperventilation to an EtCO ₂ of 25 – 30.

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Mercyhealth System
Medical Guidelines

2.54 VAGINAL BLEEDING AFTER DELIVERY

Note:

Priorities	Assessment Findings
Chief Complaint	"Vaginal bleeding after delivery"
OPQRST	Onset. Attempt to quantify the amount of blood lost
Associated Symptoms/ Pertinent Negatives	Is the patient having severe crampy pains? Has any fetal tissue passed?
SAMPLE	Has there been any prenatal care? An ultrasound? Was it normal?
Initial Exam	ABCs and correct any immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Pain or anxiety-related distress? External Hemorrhage? Skin: Pale, cool, and moist? Chest: Labored breathing? Heart: Rate and Rhythm? Abdomen: Internal hemorrhage? Tender? Distended? GU Blood loss? Neuro: ALOC?
Data	SpO ₂
Goals of Therapy	Identify potentially life-threatening hemorrhage. Treat for shock. Display sensitivity to the emotional needs of the parents. Reduce pain to the "comfortable" range.
Monitoring	Monitor blood pressure, heart rate and mental status for signs of shock.

EMERGENCY MEDICAL RESPONDER/EMT

- Oxygen 2-4 LPN per nasal cannula or higher flow if needed to maintain SpO₂ > 94%
- Massage fundus vigorously while applying suprapubic pressure with your other hand to prevent uterus from expelling. This will cause discomfort to the mother
- Place baby to breast or chest level (make sure to perform neonatal care and assessment/resuscitation)
- Transport in head down, left lateral recumbent position
- Loose bulky dressings (do not pack)
- Encourage mother to breastfeed baby if able

PARAMEDIC

- IV 0.9% NS KVO or saline lock
- 500 ml fluid bolus if patient hypotensive and lungs sounds are clear
- Treat for shock as needed refer to *Hypovolemia & Shock Guidelines*
- Continue 500 ml bolus and monitor both patients
- Consider pain control for painful contractions

Mercyhealth System
Medical Guidelines

2.56 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. This is a true medical emergency!
- Bleeding at any point in pregnancy can be associated with loss of the fetus, and parents know this. You must be sensitive to their sense of potential loss.
- 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 woman's blood pressure. If you get systolic readings between 80 – 100 mmHg, ask the mother what her most recent blood pressure was in her doctor's office.

Priorities	Assessment Findings
Chief Complaint	"Vaginal bleeding and pregnant"
OPQRST	Onset. Attempt to quantify the amount of blood lost
Associated Symptoms/ Pertinent Negatives	Is the patient having severe crampy pains? Has any fetal tissue passed?
SAMPLE	Has there been any prenatal care? An ultrasound? Was it normal?
Initial Exam	ABCs and correct any immediately life-threatening problems.
Detailed Focused Exam	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Pain or anxiety-related distress? External Hemorrhage? Skin: Pale, cool, and moist? Chest: Labored breathing? Heart: Rate and Rhythm? Abdomen: Internal hemorrhage? Tender? Distended? GU Blood loss? Neuro: ALOC?
Data	SpO ₂
Goals of Therapy	Identify potentially life-threatening hemorrhage. Treat for shock. Display sensitivity to the emotional needs of the parents. Reduce pain to the "comfortable" range.
Monitoring	Monitor blood pressure, heart rate and mental status for signs of shock.

EMERGENCY MEDICAL RESPONDER/EMT

- Oxygen 5-6 liters NC or 10-15 per NRB
- 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 and take them to the ED

PARAMEDIC

- IV 0.9% NS @ KVO or saline lock
- Give 500 ml bolus if SBP < 100 mmHg
- Treat the pain with **Fentanyl** 100mcg IV/IO/IM/IN may repeat every 10 min, max total dose 300mcg(reduce dose by 50% for smaller framed and elderly).
 - May place the patient in left lateral Trendelenburg Position, if possible.

**SECTION 3 MERCY EMS PARAMEDIC
INTER-FACILITY TRANSPORTS
TIER 1**

3.0 INTRODUCTION TO INTER-FACILITY TRANSFER GUIDELINES

Inter-Facility Guidelines are a supplement to the MERCY EMS Guidelines. Any devices, patient care equipment, or medications not covered under the Paramedic Inter-Facility Transfer Guidelines are considered outside the scope of Paramedic and must be transported at the Critical Care level or have an RN accompany patient. At times, respiratory therapist or specialty physician may need to accompany patient. Paramedics will need to have documentation of additional training prior to functioning under these Inter-Facility guidelines.

Per the transferring facility, care given in the treatment facility or hospital is to be continued en route to the accepting health care facility as long as the treatment is within the scope of practice of the paramedic.

The transferring facility will provide medical control through the sending physician. Medical Control should be contacted either prior to transport or en route to the next health care facility if the transferring crew has any questions or concerns about the care ordered by the transferring physician.

Medications listed within these patient care guidelines approved by Mercy Hospital's EMS Medical Director are permitted to be continued with transport of the patient to their accepting health care facility. These medications can be running during the transport in any form, Drip (must be controlled by mechanical pump or other controlled flow device), P.O., Paste, IM, and SQ, as ordered by the Physician for treatment of the patient. It is recommended that there be two crewmembers in back with a critical patient, i.e. STEMI.

1. Begin initial medical evaluation
2. Continuous ECG monitoring
3. Continue treatments provided by the transferring hospital of health care facility
4. Perform a complete set of vitals. For the unstable patient, vitals should be done every 5 minutes; however this can be extended to every 15 minutes for the stable patient. It is recommended that at least one blood pressure be performed manually.
5. If transferring to an Emergency Department, contact the accepting facility with the following information:
 - Patient's age, sex, and chief complaint or reason for transport
 - Facility transferring from
 - Current vital signs and medical history related to the chief complaint or reason for transport
 - Medications or treatments being continued during transport
 - Any orders from transferring facility

- Provide treatments from any orders given by medical control
- Provide comfort measures to the patient during transport
- Transfer care to accepting facility staff member with appropriate paperwork
- Contact medical control as deemed necessary for any patient concerns or orders.

3.2 MEDICATIONS CONTINUED DURING INTER-FACILITY TRANSPORTS

When transporting as a single paramedic, the paramedic must be at the patient's bedside during the transport. Not more than (2) medication drips can be running to qualify for this level of transferring crew. A normal saline, lactated ringers, or D5W may be running as a secondary line. In addition to the allowable drugs listed on the *State Medication List and Mercyhealth Pre-Hospital Medical Guidelines*, the Medical Director has approved these additional medications.

Additional Medications:

- Any antimicrobial(antibiotics/antifungals/antivirals) given as a secondary line with normal saline, lactated ringers, or D5W.
- Blood or Blood Products
- Propofol (Diprivan)(Intubated patients only)
- Dobutamine (Dobutrex)
- Dopamine
- Heparin
- Integrillin
- Norepinephrine (Levophed)
- Vasopressin
- Labetalol
- Potassium chloride
- N-acetylcysteine (NAC, Acetadote, Mucomyst)
- Insulin
- TPN
- Octreotide
- Oxytocin
- Proton pump inhibitors
- Anti-Epileptics
- Tissue Plasminogen Activator (tPA), Alteplase (Activase) or Tenecteplase (TNKase); consider RSA capability

This page updated 6/8/18

3.4 PROCEDURES CONTINUED DURING INTER-FACILITY TRANSPORTS

Paramedic must be at the patient's bedside during the transport.

- Feeding Tube
- Chest Tube placed prior to transport
- Medications via PICC Line – Started by transferring facility
- Central Line medications – Started by transferring facility
- Central core temperature monitoring (NG/OG or Foley)

3.6 DRUG INFUSION PROCEDURES

All interfacility transfer drug infusions should follow these general guidelines:

- Patient shall be placed and maintained on cardiac and pulse oximetry monitors during transport.
- Vital signs should be monitored and documented frequently based on patient condition.
- A transfer order from transferring physician must be obtained prior to transport. Transfer order must provide for maintaining the infusion during transport.
- If medication administration is interrupted (infiltration, accidental disconnection, malfunctioning pump, etc.), paramedic may restart line as delineated in transfer order. Caution will be used to prevent inadvertent overdose of medication by using a plain IV to restart the infusion.
- Infusion must be regulated by a mechanical pump familiar to the paramedic. If pump failure occurs and cannot be corrected, paramedic shall discontinue the infusion and notify transferring physician or, in the event transferring physician is unavailable, notify receiving physician.
- Medical director and EMS agency leadership must be notified in event of equipment issues.

3.8 DOBUTAMINE OR NOREPINEPHRINE

Usage: When parenteral therapy is necessary for inotropic support in the short-term treatment of adults with cardiac decompensation due to depressed contractility.

Adverse Reactions:

- Increase HR, BP, may develop rapid ventricular response in atrial fib.
- Ectopics - may precipitate or exacerbate. Rarely causes VT.
- Hypersensitivity - rash, fever, eosinophilia, bronchospasm. May be worse in patients who have shown previous manifestations of hypersensitivity.
- Sodium bisulfite may cause allergic reaction, anaphylaxis, asthmatic.
- May be ineffective if receiving beta blockers; may have increased peripheral vascular resistance.

Standing Orders:

- Must be initiated at the transferring hospital.
- Verify infusion rate, infusion dosage, patients' weight prior to transfer.
- Monitor vital signs every 5 minutes. If heart rate increases more than 15% of baseline or hypotension occurs, notify medical control physician.
- No IV push drugs can be given through a Dobutamine or norepinephrine infusion.
- If any redness, swelling, tenderness, warmth appears at IV site, discontinue IV after reestablishing a new IV site.
- Rates of infusion should not be changed unless ordered by medical control or transferring doctor.

3.10 PROPOFOL (DIPRIVAN)

Usage: IV sedative hypnotic agent

Adverse Effect: Bradycardia, hypotension, hypertension, apnea, reduced cardiac output

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Monitor vital signs every 5 minutes including heart rhythm. Notify medical control if vital signs deviate from the predetermined parameters set forth by the transferring hospital.
- Rates of infusion should not be changed unless ordered by medical control or transferring doctor. Increase rate at 5-10 minute intervals in increments of 5 to 10 mcg/kg/min until desired level of sedation is achieved.
- If signs of a reaction, stop infusion and treat the reaction signs and symptoms. Discontinue and notify appropriate medial direction facility if patient develops severe hypotension, bradycardia or hypersensitivity occurs.
- Notify sending facility that the infusion has been stopped.
- Rates of 5 to 50 mcg/kg/min or higher may be required.

Propofol Drip Chart

		Patient Weight										
<i>mcg/kg/min</i>	<u>35 kg</u>	<u>40 kg</u>	<u>45 kg</u>	<u>50 kg</u>	<u>55 kg</u>	<u>60 kg</u>	<u>65 kg</u>	<u>70 kg</u>	<u>75 kg</u>	<u>80 kg</u>	<u>90 kg</u>	<u>100 kg</u>
<u>5 mcg</u>	<u>1.05</u>	<u>1.2</u>	<u>1.35</u>	<u>1.5</u>	<u>1.65</u>	<u>1.8</u>	<u>1.95</u>	<u>2.1</u>	<u>2.25</u>	<u>2.4</u>	<u>2.7</u>	<u>3</u>
<u>10 mcg</u>	<u>2.1</u>	<u>2.4</u>	<u>2.7</u>	<u>3</u>	<u>3.3</u>	<u>3.6</u>	<u>3.9</u>	<u>4.2</u>	<u>4.5</u>	<u>4.8</u>	<u>5.4</u>	<u>6</u>
<u>20 mcg</u>	<u>4.2</u>	<u>4.8</u>	<u>5.4</u>	<u>6</u>	<u>6.6</u>	<u>7.2</u>	<u>7.8</u>	<u>8.4</u>	<u>9</u>	<u>9.6</u>	<u>10.8</u>	<u>12</u>
<u>30 mcg</u>	<u>6.3</u>	<u>7.2</u>	<u>8.1</u>	<u>9</u>	<u>9.9</u>	<u>10.8</u>	<u>11.7</u>	<u>12.6</u>	<u>13.5</u>	<u>14.4</u>	<u>16.2</u>	<u>18</u>
<u>40 mcg</u>	<u>8.4</u>	<u>9.6</u>	<u>10.8</u>	<u>12</u>	<u>13.2</u>	<u>14.4</u>	<u>15.6</u>	<u>16.8</u>	<u>18</u>	<u>19.2</u>	<u>21.6</u>	<u>24</u>
<u>50 mcg</u>	<u>10.5</u>	<u>12</u>	<u>13.5</u>	<u>15</u>	<u>16.5</u>	<u>18</u>	<u>19.5</u>	<u>21</u>	<u>22.5</u>	<u>24</u>	<u>27</u>	<u>30</u>
<u>60 mcg</u>	<u>12.6</u>	<u>14.4</u>	<u>16.2</u>	<u>18</u>	<u>19.8</u>	<u>21.6</u>	<u>23.4</u>	<u>25.2</u>	<u>27</u>	<u>28.8</u>	<u>32.4</u>	<u>36</u>
<u>70 mcg</u>	<u>14.7</u>	<u>16.8</u>	<u>18.9</u>	<u>21</u>	<u>23.1</u>	<u>25.2</u>	<u>27.3</u>	<u>29.4</u>	<u>31.5</u>	<u>33.6</u>	<u>37.8</u>	<u>42</u>
<u>80 mcg</u>	<u>16.8</u>	<u>19.2</u>	<u>21.6</u>	<u>24</u>	<u>26.4</u>	<u>28.8</u>	<u>31.2</u>	<u>33.6</u>	<u>36</u>	<u>38.4</u>	<u>43.2</u>	<u>48</u>
<u>90 mcg</u>	<u>18.9</u>	<u>21.6</u>	<u>24.3</u>	<u>27</u>	<u>29.7</u>	<u>32.4</u>	<u>35.1</u>	<u>37.8</u>	<u>40.5</u>	<u>43.2</u>	<u>48.6</u>	<u>54</u>
<u>100 mcg</u>	<u>21</u>	<u>24</u>	<u>27</u>	<u>30</u>	<u>33</u>	<u>36</u>	<u>39</u>	<u>42</u>	<u>45</u>	<u>48</u>	<u>54</u>	<u>60</u>

ml/hr

3.12 FIBRINOLYTICS

Type Utilized: Alteplase (Activase) CVA, Tenecteplase (TNKase)

Usage: Acute myocardial infarction or CVA. To dissolve the clot to reduce infarct size thus reducing myocardial muscle damage or brain damage.

Adverse Reactions: Bleeding, Reperfusion arrhythmias, Stroke, Hypotension, Elevated temperature, Anaphylactic reaction

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor vital signs, neuro status, and document every 5 minutes.
- Monitor for any signs/symptoms of bleeding internally or externally. Notify base station physician of any signs of bleeding.
- Treat reperfusion arrhythmias per guidelines and notify base station physician.
- Notify medical control or transferring facility of any reoccurrence or worsening chest pain.
- Consider RSA capability.

This page updated 6/8/18

3.14 ANTIMICROBIALS

Usage: To treat pre-existing infections or as a prophylactic measure in patients that are at high risk of developing an infection.

Adverse Reactions: Allergic reactions, rash, swelling, nausea, vomiting, diarrhea, chills, fever, laryngeal edema, anaphylaxis, leukopenia. Ototoxicity, and nephrotoxicity.

Standing Orders:

- IV antimicrobials must be initiated by the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Infusion rate should not be changed during transport.
- Monitor for signs and symptoms of an allergic response. If any symptoms are noted, stop infusion, treat for allergic reaction or anaphylaxis, and contact medical control or transferring doctor.
- If IV antimicrobials have finished infusing enroute, keep line open with IV fluids KVO unless otherwise indicated by the transferring doctor.

3.16 BLOOD OR BLOOD PRODUCTS

- The Paramedic must confirm the order for blood transfusion.
- Only accept a blood transfusion that has been started by the sending facility.
- Make sure the patient is wearing an ID bracelet with his/her name and hospital ID number from the sending hospital. Confirm the patient's name and ID number, match those on the unit of blood.
- If more than one (1) unit of blood is to be transfused, all of the units should be hung by the Nurse at the originating facility. Paramedics may not initiate any units for transfusion.
- Assess and confirm the patency of the transfusion of the transfusion site prior to leaving the hospital. If the site becomes red and shows signs of infiltration during transport, the infusion should be discontinued.
- The following criteria must be met:
 - Blood transfusions must be through a primary IV of Normal Saline
 - Blood must be transfused through a filter, using only hospital issued tubing for transfusions.
 - Empty blood bags and the attached tubing must be saved for disposal by the staff at receiving hospital.
- Vital Signs, including lung sounds should be assessed at the following intervals:
 - After first 5 minutes and every 15 minutes after the start of each unit of blood
- Make sure to document the time the transfusion was started at the originating hospital so that these parameters are accurate. Vitals should also include temperature monitoring.
- If the patient develops any of the following the transfusion should be stopped and the patient treated as per guideline. Contact medical control as soon as possible.
 - Shortness of breath or chest pain
 - Flushing of the torso and/or itching
 - Sudden and unexplained pain in the neck, chest, or lumbar area
 - Hives and /or rash
 - Pulmonary edema and/or wheezing
 - Shaking chills/fever
 - Signs and symptoms of shock

3.18 CHEST TUBES

1. Monitoring of Thoracostomy (Chest) Tube

- Patient shall be placed and maintained on cardiac and pulse oximetry or capnography monitors during transport.
- Signed transfer order from the transferring physician must be obtained prior to transport. Transfer order must specify the maintenance of chest tube either to gravity or mechanical suction drainage. If mechanical suction drainage, the amount of mechanical suction must be specified.
- Mechanical suction rate must remain constant during the transport with no regulation of the rate being performed by paramedic.
- Collection receptacle must be kept below level of the chest to prevent drained fluid from re-entering the pleural space. Do not allow the collection receptacle to tip over.
- If hemorrhage occurs through the chest tube, observe for signs and symptoms of shock and treat according to guideline.

Complications:

- If the thoracostomy tube is partially pulled out:
 - Do not push the tube back into the chest.
 - Secure the site.
- If the thoracostomy tube is completely pulled out, place an occlusive dressing over the insertion site.
- If air leaks are present, check all connections.
- If the patient becomes dyspneic:
 - Assess breath sounds
 - Needle thoracostomy may need to be performed

Precautions:

- Avoid pulling on thoracostomy tube as this can cause accidental dislodgement of the tube.
- Do not restrict gravity or suction drainage from the chest by the use of clamps, dependent loops or kinks in tubing as this will interfere with flow of drainage and may lead to increased pleural pressure or formation of clots.
- Do not disconnect the drainage system or puncture tubing. Tape all connections securely to prevent violation of sterility and loss of negative pressure.

3.20 STOMA AND TRACHEOSTOMY CARE

- Temporary or permanent placement of a tracheostomy tube is often necessary to maintain an open airway.
- Patients with tracheostomy tubes or stomas should not be intubated orally
- Suctioning of surgical airways is often required to attempt to clear and maintain an open airway.
- Administration of inhaled medications will need to be given via the stomas or tracheostomy tubes.
- 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. Compression of the trachea may result.
- **Suctioning:**
 - Equipment:
 - Appropriate size suction catheter
 - Suction unit with adjustable suction capacity
 - Manual resuscitation (Bag-valve-mask device) with oxygen supply
 - 5 ml syringe filled with sterile saline
 - Contraindication: Use of demand valve
 - Procedure:
 - Adjust suction to 120 - 150 mm Hg
 - Apply sterile gloves.
 - Flush suction catheter with saline to lubricate tip and establish patency of suction catheter.
 - Remove the T-tube if a tracheostomy patient is on humidified oxygen.
 - Ventilate the patient with 100% oxygen several times.
 - Insert the suction catheter into the stoma or tracheostomy opening with the suction off (the thumb hole open). The short length of the tracheostomy tube facilitates suctioning. The catheter may be directed through the right or left bronchus by having the patient turn his/her head to the opposite side.
 - Apply suction by occluding the thumb hole while slowly withdrawing the catheter in a twisting motion. Suction of a tracheostomy tube should take no longer than 10 seconds for the adult patient.

- If mucus plugs or thick secretions are present, the instillation of 3 - 5 ml of sterile saline may be helpful.
- Hyperventilate with 100% O₂.
- Check breath sounds.
- Suctioning can stimulate a cough reflex. Allow the patient to cough. Be prepared to suction or catch secretions from the tracheal opening. Recheck breath sounds.

Stoma Intubation

- Equipment:
 - appropriate sized cuffed and uncuffed ET tubes
 - bougie
 - bag-valve-mask
 - appropriate sized suction catheters
 - oxygen supply
 - suction equipment with adjustable suction capacity
- Contraindication: Use of demand valve
- Procedure:
 - Select the largest endotracheal tube that will fit through the stoma without force. Check the cuff, unless an uncuffed tube is being used.
 - Hyperventilate with 100% oxygen using a bag-valve-mask device with the facemask fitted over the stoma. Do not use demand valve.
 - Wear sterile gloves. Do not use a stylette. It is not necessary to lubricate the tube.
 - Suction, if necessary.
 - Pass the bougie into the stoma. Slide the endotracheal tube over the bougie ½ the length of the endotracheal tube, remove bougie and inflate the cuff. The pharynx has been bypassed, so the tube will protrude from the neck several inches.
 - Hold the tube in place, watch for chest rise with ventilation.
 - Use etCO₂ waveform for confirmation.
 - Auscultate the lung fields. Check the neck for subcutaneous emphysema, indicating false passage.
 - Secure the tube.
 - Allow no longer than 30 seconds for the procedure.

This page updated 3/22/18

3.22 HEPARIN

Usage: Heparin injection is an anticoagulant. It is used to decrease the clotting ability of the blood and help prevent harmful clots from forming in blood vessels.

Heparin will not dissolve blood clots that have already formed, but it may prevent the clots from becoming larger and causing more serious problems.

Adverse Reactions: Bleeding, thrombocytopenia, hypersensitivity reactions, chills, fever, and urticaria as the most usual manifestations. Asthma, rhinitis, lacrimation, headache, nausea and vomiting and anaphylactoid reactions, including shock, occurring more rarely. Itching and burning, especially on the plantar site of the feet may occur.

Standing Orders:

- IV heparin must be initiated by the transferring hospital and transported on pump.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Infusion rate should not be changed during transport.
- Monitor for signs and symptoms of an allergic response. If any symptoms are noted, stop infusion, treat for allergic reaction or anaphylaxis, and contact medical control or transferring doctor.
- Monitor for signs of bleeding including hypotension and tachycardia. If any symptoms develop, stop infusion, and contact medical control or transferring doctor.

3.24 INTEGRILLIN

Type Utilized: Integrilin is used to prevent blood clots or heart attack in people with severe chest pain or other conditions, and in those who are undergoing a procedure called angioplasty (to open blocked arteries).

Usage: Acute myocardial infarction.

Adverse Reactions: Bleeding, Reperfusion arrhythmias, Stroke, Hypotension, Elevated temperature, Anaphylactic reaction

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor vital signs every 5 minutes.
- Monitor for any signs/symptoms of bleeding internally or externally. Notify base station physician of any signs of bleeding.
- Treat reperfusion arrhythmias per guidelines.
- Notify medical control or transferring facility of any reoccurrence or worsening chest pain.

3.26 LABETALOL

Usage: Beta blocker utilized in acute myocardial infarction or CVA to control HR and BP.

Adverse Reactions: Hypotension, bradycardia

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor vital signs every 5 minutes.
- Monitor for any signs/symptoms of hypotension or bradycardia.
- Notify medical control or transferring facility of any changes in patient condition.

3.28 POTASSIUM CHLORIDE

Usage: Electrolyte replacement.

Adverse Reactions: Burning at IV site, hyperkalemia, arrhythmias.

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor continuous EKG and vital signs every 5 minutes.
- Monitor for any signs/symptoms of hypotension, bradycardia, peaked T-waves.
- If signs of hyperkalemia, discontinue infusion and follow hyperkalemia treatment as outlined in cardiac arrest guideline.
- Notify medical control or transferring facility of any changes in patient condition.

3.30 N-ACETYLCYSTEINE (NAC, Acetadote, Mucomyst)

Usage: Therapy for acetaminophen toxicity.

Adverse Reactions: Wheezing, tightness in chest, or difficulty in breathing (especially in asthma patients). Clammy skin, fever, increased mucus, irritation or soreness of mouth/throat/lungs, nausea/vomiting, runny nose.

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor continuous EKG and vital signs every 5 minutes.
- Monitor for any signs/symptoms of severe allergic reaction or discomfort.
- If signs of severe reactions, stop infusion and notify medical control or transferring facility of any changes in patient condition.

3.32 INSULIN

Usage: Therapy for hyperglycemia and DKA

Adverse Reactions: Hypoglycemia, dizziness, fatigue, diaphoresis, confusion.

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor continuous EKG and vital signs every 5 minutes.
- Check blood sugar every 20 minutes and for any change in mental status.
- Monitor for any signs/symptoms of severe reaction or discomfort.
- If signs of severe reactions or hypoglycemia, stop infusion, treat per *Diabetic Emergencies Guideline*, and notify medical control or transferring facility of any changes in patient condition.

This page updated 1/10/22

3.34 TUBE FEEDING AND TOTAL PARENTERAL NUTRITION (TPN)

Usage: Therapy for dehydration, malnutrition

Adverse Reactions: Hypoglycemia, dizziness, fatigue, diaphoresis, confusion, vomiting, aspiration.

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor continuously during transport for signs of aspiration for tube fed patients.
- Check blood sugar for any change in mental status.
- Monitor for any signs/symptoms of severe reaction or discomfort.
- If signs of severe reactions or hypoglycemia, stop infusion, treat per *Diabetic Emergencies Guideline*, and notify medical control or transferring facility of any changes in patient condition.

This page updated 1/10/22

3.36 OCTREOTIDE

Usage: GI Bleeding

Adverse Reactions: Gall Bladder sludging or stones, diarrhea and GI upset, hypoglycemia

Standing Orders:

- Infusion must be initiated at the transferring hospital.
- Typically 50mcg IV bolus, then 50mcg/hour
- Verify concentration and infusion rate and other drug compatibility prior to leaving transferring hospital.
- Monitor continuous EKG and vital signs every 5 minutes.
- Check blood sugar every 20 minutes and for any change in mental status.
- Monitor for any signs/symptoms of severe reaction or discomfort.
- If signs of severe reactions or hypoglycemia, stop infusion, treat per *Diabetic Emergencies Guideline*, and notify medical control or transferring facility of any changes in patient condition

This page updated 1/10/22

3.38 PROTON PUMP INHIBITORS

Usage: GI Bleeding. Decreases secretion of gastric acid or chronic reflux.

Adverse Reactions: Occasional CNS symptoms, more so in the elderly, jaundice, GI upset

Standing Orders:

- Infusion to be started at sending facility.
- Pantoprazole (Protonix):
 - a. Bolus: 80mg over 5 minutes
 - b. Infusion: 8 mg/hour
- Lansoprazole (Prevacid):
 - a. Bolus: 30-60mg over 30 minutes
 - b. Infusion: 6mg/hour
- Ranitidine (Zantac):
 - a. Bolus: 50mg over 20-30 minutes
 - b. Infusion: 150mg over 24 hours

3.40 ANTI-EPILEPTICS

Usage: Seizure prevention

Adverse Reactions: CNS symptoms, electrolyte disturbances

Standing Orders:

- Infusion to be started at sending facility.
- Keppra (levetiracetam)
 - a. 500-1500mg infused over 15 minutes
- Dilantin (phenytoin)
 - a. 15mg/kg infusion
 - b. Not to exceed 40mg/min
- Cerebyx(fosphenytoin)
 - a. 15-20mg PE/kg/dose
 - b. Not to exceed 150mg PE/min
- Depacon(valproate sodium)
 - a. 15mg/kg infusion
 - b. Not to exceed 20mg/min
- Phenobarbital
 - a. 15-20mg/kg
 - b. Not to exceed 100mg/min
 - c.
- Monitor vitals every 10 minutes
- Continuously monitor mental status and observe for seizures, treat per AMS or seizure protocol

This page updated 1/10/22

3.42 NIPPV NONINVASIVE POSITIVE PRESSURE VENTILATION (BiPAP)

Indications for use: Severe Respiratory Distress(Asthma, CHF, COPD, etc. not responding to other treatments)

Adverse Reactions: Hypotension, pneumothorax, gastric distention, aspiration, pressure sores/skin breakdown

Contraindications: Respiratory/cardiac arrest, hypotension, altered mental status, inability to maintain patent airway, pneumothorax/penetrating chest trauma, vomiting or active GI bleeding with emesis, unstable facial fractures, circumstances in which endotracheal intubation or a surgical airway is preferred or necessary to secure a patent airway

Standing Order:

Noninvasive Positive Pressure Ventilation (NIPPV) other than CPAP is limited to Tier One Providers that have completed NIPPV training, credentialed by the medical director, and are equipped with NIPPV Equipment. NIPPV other than CPAP will only be used for interfacility transport per orders of the sending facility.

Refer to the manufacturer's ventilator operation manual for specific directions on how to operate the BiPAP device.

- Patient shall be placed and maintained on cardiac and pulse oximetry monitors during transport.
- Reassess vital signs every five min while the patient is on NPPV and document.
- Continue NIPPV settings for appropriate clinical conditions.
- Monitor ETCO₂ and waveform capnography
- Do not exceed 20 cmH₂O on total inspiratory pressure. Typical starting pressures may be IPAP 10-14 and EPAP 4-8
- Pressure support is typically no less than 5 cmH₂O (Difference between IPAP/EPAP)
- Explain the procedure to the patient. Be prepared to coach patient.
- Fit and size mask to patient, ensure seal.
- If able, continue FIO₂ per sending facility. Goal is to titrate FIO₂ to maintain SpO₂ >94% but may change depending on clinical circumstances.
- Set high-pressure alarm limit.
- Consider adjusting rise time and flow termination parameters to enhance patient synchrony and comfort.
- If the patient is receiving a nebulized bronchodilator, it may be continued by placing the nebulizer device in-line with the NPPV circuit, between the filter and the patient mask. Follow manufacturer's instructions.

This page updated 1/10/22

- Per Orders Adjust IPAP (Pressure Support) up or down depending on the amount of assistance that the patient requires (check expired tidal volumes) and adjust the EPAP (PEEP) according to the patients respiratory status at that time. (Note that delivered tidal volumes depend on the gradient between the IPAP and EPAP, inspiratory time, and the patient's inspiratory effort).
- If the patient deteriorates and/or meets one or more of the contraindications below then discontinue the use NIPPV. Consider, BVM, Supraglottic Airway or Intubation as needed.
- Consider anxiolytic administration per sending facility order however be aware of potential for respiratory depression.

Special Notes:

1. Do not remove NIPPV until hospital therapy is ready to be placed on the patient.
2. Assess the patient for gastric distention.
3. NIPPV may be able to be used on DNR patients not in arrest.
4. Due to changes in cardiac preload and afterload during NIPPV closely monitor vitals

This page updated 1/10/22

SECTION 4 MERCY EMS DRUG LIST

4.0 APPROVED MEDICATION LIST

EMR	EMT	I99	P	Medication
		√	√	Adenosine (Adenocard) 12mg/4ml pre-loaded syringe
√	√	√	√	Albuterol Sulfate 0.83% 2.5mg/3ml unit dose
		√	√	Amiodarone Hydrochloride (Cordarone) 150mg/10ml pre-load syringe
√	√	√	√	Aspirin bottle, chewable baby, 81mg tablets
		√	√	Atropine Sulfate 1mg/10ml preloaded syringe
			√	Calcium Chloride 10% solution, 1gram/10ml pre-loaded syringe
			√	Cyano-Kit
		√	√	Dextrose 10%
			√	Diltiazem (Cardizem) 5mg/ml 5ml vial (refrigerated)
		√	√	Diphenhydramine Hydrochloride (Benadryl) 50mg/1ml vial
	√	√	√	Diphenhydramine Hydrochloride (Benadryl) 12.5mg tablets or 12.5mg/5ml liquid
		√	√	Epinephrine 1mg/10ml solution, 1mg/10ml preloaded syringe
		√	√	Epinephrine 1:1000 solution, 1mg/1ml ampule
√	√	√	√	Epinephrine (adult and pediatric) pre-loaded auto injector
			√	Etomidate 40mg/20ml vial
	√	√	√	Glucagon (Glucagen) 1mg/1ml reconstituted vials
√	√	√	√	Glucose Oral Gel 15-25g/tube or Tablets g/tab
			√	Hydromorphone 1mg/1ml
	√	√	√	Ipratropium Bromide (Atrovent) 0.5mg/2ml unit dose
		√	√	IV fluids (Normal Saline, Lactated Ringers, D5W)
			√	Ketamine 500mg/5ml
			√	Labetalol 100mg/20ml
		√	√	Lidocaine Hydrochloride 2% 100mg/5ml preloaded syringe
			√	Magnesium Sulfate 50% 5gram/10ml pre-loaded syringe
√	√	√	√	Mark I Kit (Atropine & Pam2chloride) pre-loaded auto injector
		√	√	Methylprednisolone (Solu-Medro) 125mg/2ml Act-O-Vial
			√	Metoprolol tartrate (Lopressor) 5mg/5ml vial (If labetalol unavailable)
		√	√	Midazolam Hydrochloride (Versed) 10mg/2ml vial
√	√	√	√	Naloxone Hydrochloride (Narcan) 2mg/2ml pre-loaded syringe
		√	√	Nitroglycerin 0.4mg/tab or metered spray
			√	Nitroglycerin Paste packet
		√	√	Ondansetron Hydrochloride (Zofran) 4mg/2ml vial
	√	√	√	Ondansetron ODT 4mg Oral Dissolving Tablet
			√	Rocuronium Bromide (Zemuron) 50mg or 100mg vial (If vecuronium unavailable)
			√	Sodium Bicarbonate 8.4% 50mEq/50ml, preload syringe
			√	Succinylcholine Chloride (Anectine) 200mg/10ml vial
			√	Tetracaine 0.5%
			√	Tranexamic Acid (TXA) 1G vial
			√	Vecuronium Bromide (Norcuron)10mg vial-powder

Concentrations above are preferred but may require substitution based on availability.

This page updated 1/10/22

4.2 ADENOSINE (ADENOCARD)

INDICATION:

1. Conversion of paroxysmal supraventricular tachycardia (PSVT).

PRECAUTIONS:

1. May worsen bronchospasm in asthmatics and some patients with COPD.
2. Flushing and chest pain may occur briefly after administration.
3. Do not use in patients with second or third degree heart block.
4. A reduced dose must be used in heart transplant recipients.

CONTRAINDICATIONS:

1. 2nd or 3rd degree heart block

ADMINISTRATION:

1. A 6 mg IV bolus may be given. Pediatric dose is 0.1 mg/kg. Document effect on rhythm on ECG strip.
2. If rhythm does not convert or does not slow enough to allow diagnosis, a second and third dose of 12 mg may be given. Pediatric second dose is 0.2 mg/kg.
3. Adenosine IV injection must be given rapidly via the IV port closest to the patient, followed by at least a 20ml rapid flush to assure the entire drug has cleared the IV tubing. Elevation of arm during administration may be beneficial.
4. In heart transplant recipients, the initial dose is 4 mg. If a second dose is necessary, 8 mg may be given after medical control contact.

SPECIAL NOTES:

1. This drug is a naturally occurring nucleoside found in all cells of the body. It is cleared very rapidly, having a half-life of less than 10 seconds. Thus the drug must be given as a rapid bolus. Side effects are also usually very short lived.
2. After the administration of adenosine, a rhythm other than PSVT may be evident, resulting in the choosing of a different form of treatment.
3. In doses of 6-12 mg, there are usually minimal hemodynamic side effects, i.e. hypotension.
4. At the time of conversion, a variety of new rhythms may appear on the ECG. Short-lasting first, second or third degree heart block or transient asystole may result after administration. Due to the drugs short half-life, these effects are generally self-limiting.
5. A minimum of 18 mg of adenosine must be carried on all ALS rigs to ensure enough medication for the initial and second doses.

REFERENCE GUIDELINE:

Narrow Complex Tachycardia
Wide Complex Tachycardia

4.4 ALBUTEROL SULFATE

INDICATION:

1. For relief of acute bronchospasm.

PRECAUTIONS:

1. 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 and albuterol inhibit the effect of each other.
4. **Use with caution in patients with cardiovascular disorders**, or in patients being treated with antidepressants.

CONTRAINDICATION:

1. Allergy or known hypersensitivity to albuterol.

ADMINISTRATION:

1. Pour contents of one unit dose bottle (2.5 mg = 3 ml of 0.083% solution) into nebulizer reservoir.
2. Connect nebulizer to oxygen source at 6 liters per minute.
3. Have patient breath as calmly, deeply, and evenly as possible until no more mist is found in the nebulizer chamber (5-15 minutes). Routine nebulizer therapy should be accomplished using the nebulizer unit and instructing the patient to close his/her lips tightly around the mouthpiece. An acceptable alternative to using the mouthpiece would be to attach the nebulizer reservoir to an oxygen mask, i.e. remove the bag from a non-rebreather nebulizer reservoir and do not use the T-piece or the mouth piece.
4. Restart patient on oxygen at appropriate concentration.
5. Treatments may be repeated as needed.
6. Notify medical control that Albuterol has been given.

SPECIAL NOTES:

1. May begin treatment prior to IV therapy. This may decrease anxiety in the patient.
2. Whenever possible, nebulizer treatment should be administered en route rather than delaying transport, however nebulizer treatments for the patient with active tuberculosis should be performed in well-ventilated areas (outside patient compartment).
3. Solution should be clear and colorless to light yellow.
4. Store between 36 and 77 degrees F.
5. Utilized in treating COPD, Emphysema, Chronic Bronchitis, and Asthma.

REFERENCE GUIDELINE:

Respiratory Distress

4.6 AMIODARONE HYDROCHLORIDE (CORDARONE)

INDICATIONS:

ACLS

PRECAUTIONS:

1. Continuous cardiac monitoring is required due to potential of arrhythmias.

CONTRAINDICATIONS:

1. Cardiogenic shock
2. 2nd or 3rd degree block
3. Severe SA node disease resulting in bradycardia unless an artificial pacemaker is present.
4. In unstable patients, use cardioversion or defibrillation prior to amiodarone.
5. Torsades

ADMINISTRATION:

1. 150 mg in 100 ml 0.9% NS, mix for infusion.
2. Comes in 150 mg/3ml vial or 10ml preload syringe.
3. Initial pulseless dose is 300 mg, a second 150 mg can be given in 4 minutes if still pulseless.
4. Antiarrhythmic dose is 150mg over 10 minutes.

SPECIAL NOTES:

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

REFERENCE GUIDELINE:

*Cardiac Arrest
Wide Complex Tachycardia
Narrow Complex Tachycardia*

This page updated 1/10/22

4.8 ASPIRIN

INDICATION:

1. Suspected cardiac ischemia.

PRECAUTIONS:

1. Recent internal bleeding (within last 3 months).
2. Known bleeding diseases.
3. Recent surgery.
4. Possibility of pregnancy.
5. Currently using Coumadin (Warfarin)

CONTRAINDICATIONS:

1. True allergy to aspirin or other non-steroidal anti-inflammatory agents, this includes many non-aspirin/non-Tylenol pain relievers such as Advil and Aleve.

ADMINISTRATION:

1. For the comfort of the patient, it is preferred to orally administer 4 chewable aspirin (81mg tablets) commonly called baby aspirin.
2. Some patients take an adult aspirin (325mg) prior to arrival of EMS, and should not be given any more.
3. If the patient normally takes 1 baby aspirin in the morning, still give the guideline dose of 324mg.

SPECIAL NOTES:

1. An expected side effect is upset stomach, which is not a reason to not give it.
2. If patient is already on Coumadin, still give recommended aspirin dose, but look for signs of bleeding. Aspirin works differently on the anticoagulant cascade, and is highly beneficial in reducing mortality in cardiac events.

REFERENCE GUIDELINE:

Chest Pain
Congestive Heart Failure

4.10 ATROPINE SULFATE

INDICATION:

1. For brady-arrhythmias (electrical activity less than 50/minute), either supraventricular or ventricular in origin, accompanied by significant hypotension, PVCs or lightheadedness.
2. Organophosphate poisoning.

PRECAUTIONS:

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

ADMINISTRATION:

1. For symptomatic bradycardia, administer atropine 1 mg IV push every 3 to 5 minutes up to a total of 3 mg. Pediatric 0.02mg/kg(max single dose 0.5mg child, 1.0mg adolescent)to a maximum of 1 mg for a child, 2 mg for an adolescent.
2. Monitor change in heart rate and blood pressure.
3. For organophosphate poisoning, administer 1 to 5 mg IV/IO every 5 minutes depending on severity of symptoms.
4. If unable to establish IV, it may be given IO.

SPECIAL NOTES:

1. Atropine may not be effective if the rhythm is idioventricular.
2. Second degree or complete heart blocks are generally unresponsive to atropine. In these situations, epinephrine or external pacing is the treatment of choice.
3. For post cardiac arrest bradycardia pacing is preferred to atropine.

REFERENCE GUIDELINE:

*Bradycardia
Respiratory Distress
Toxic Exposure/Overdose*

This page updated 1/10/22

4.12 CALCIUM CHLORIDE 10%

INDICATION:

1. Pre-existing hyperkalemia.
2. Hypocalcemia.
3. Calcium channel blocker toxicity.

PRECAUTIONS:

1. Rapid administration of calcium in a beating heart may produce slowing of the cardiac rate.
2. Patients taking digitalis may have increased ventricular irritability and calcium may produce digitalis toxicity.
3. Do not inject Calcium Chloride in the same IV line as Sodium Bicarbonate as precipitation will occur.

ADMINISTRATION:

1. Adult 10mg/kg (normal dose is one amp)
2. Pediatric 20mg/kg, follow Broselow Tape or approved medical director product or app for accurate pediatric dosing.
3. Supplied in preloaded syringe containing 1000mg per 10ml (100mg/ml)

SPECIAL NOTES:

REFERENCE GUIDELINE:

*Cardiac Arrest
Toxic Exposure/Overdose*

4.14 DEXTROSE 10%

INDICATION:

1. Suspected or known hypoglycemia.

PRECAUTIONS:

1. Infiltration can cause tissue necrosis.

ADMINISTRATION:

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. Start IV of Normal Saline, 0.9 Sodium Chloride TKO, ensure patency.
3. Administer dextrose 10% (12.5 grams) IV to adults.
4. Administer dextrose 10% 5ml/kg to maximum of 12.5 grams to pediatrics.
5. Repeat blood glucose measurement in 5 minutes.

SPECIAL NOTES:

1. ALS services: In patients with blood sugars of < 70 mg/dL, IV dextrose and/or glucagon are considered first/second line treatment.
2. Consultation with the monitoring physician is mandatory if considering non-transport after IV dextrose or oral administration of glucose. 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.
3. Overdose of insulin, intentional or otherwise, should be transported.
4. All patients that are hypoglycemic and on sulfonylureas must be transported due to rebound hypoglycemia.

REFERENCE GUIDELINE:

*Hypoglycemia
Altered Level of Consciousness*

This page updated 1/10/22

4.16 DILTIAZEM (CARDIZEM)

INDICATION:

1. Atrial fibrillation or atrial flutter: Temporary control of rapid ventricular rate in atrial fibrillation or atrial flutter. It should **not** be used in patients with atrial fibrillation or atrial flutter associated with an accessory bypass tract such as in Wolf-Parkinson-White (WPW). [See Amiodarone for WPW]

PRECAUTIONS:

1. Symptomatic hypotension may result.
2. PVCs may be present on conversion of PSVT to sinus rhythm. They are transient and typically benign.
3. Can cause hypotension, push slowly over 2-3 minutes.
4. Pediatrics

CONTRAINDICATIONS:

1. Patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker.
2. Patients with second or third degree AV block except in the presence of a functioning ventricular pacemaker.
3. Patients with severe hypotension or cardiogenic shock.
4. Patients who have demonstrated hypersensitivity to the drug.
5. Patients with Wolf-Parkinson-White (WPW) syndrome.
6. Patients with ventricular tachycardia. Administration of calcium channel blockers to patients with wide complex tachycardia (QRS > 0.12 seconds) has resulted in hemodynamic deterioration and ventricular fibrillation.

ADMINISTRATION:

1. Supplied in vial of 5mg/5ml (25mg) and requires refrigeration.
2. IV slow push 0.25 mg/kg actual body weight **over 2 minutes** (15 mg for the average patient).
3. If inadequate response after 15 minutes, re-bolus with 0.35 mg/kg **over 2 minutes** (20 mg for the average patient).
4. Maintain infusions at 5-15 mg/hr if patient currently on infusion.

SPECIAL NOTES:

REFERENCE GUIDELINE:

Narrow Complex Tachycardia

4.18 DIPHENHYDRAMINE HYDROCHLORIDE (BENADRYL)

INDICATION:

1. In anaphylaxis, as an adjunct to epinephrine.
2. In allergic reactions.
3. Extrapyramidal symptoms from psychotropic drugs.

PRECAUTIONS:

1. Use cautiously in children, as overdose may cause hallucinations, convulsions, or death.
2. In elderly, antihistamines may cause dizziness, sedation, and hypotension.
3. Side effects include sedation, dizziness, epigastric distress, and thickening of bronchial secretions.
4. Benadryl has an atropine-like action, therefore use with caution in patients with bronchial asthma, hyperthyroidism, cardiovascular disease, hypertension, and COPD.

CONTRAINDICATIONS:

1. Allergy or known hypersensitivity to diphenhydramine HCL.
2. Newborn or premature infants.

ADMINISTRATION:

1. Supplied in vial 50mg/ml.
Administer 50mg IV or IM. Pediatric dose is 1 mg/kg to a maximum of 50 mg.

SPECIAL NOTES:

1. Benadryl is an antihistamine with anticholinergic and sedative side effects.
2. Benadryl in the injectable form has a rapid onset of action.
3. IV route is preferred. DEEP IM route can be used if unable to establish an IV.

REFERENCE GUIDELINE:

*Allergic & Anaphylaxis
Nausea & Vomiting*

This page updated 1/10/22

4.20 DOPAMINE HYDROCHLORIDE

INDICATION:

1. Symptomatic hypotension in the absence of hypovolemia.

PRECAUTIONS:

1. May increase heart rate and induce supraventricular or ventricular tachycardia.
2. May compromise cardiac output.
3. May produce tissue necrosis if infusion infiltrates.

ADMINISTRATION:

1. Comes prepared in various size bags. Most common concentration is 1.6mg/ml.
2. Start infusion at 5 mcg/kg/min titrated to satisfactory hemodynamic performance. (See Drip Rate Chart on following page for 400mg in 250 D5W or 800 mg in 500 D5W concentrations.)
3. Pediatric dose is the same as adult.
4. Titrate to effect for blood pressure or heart rate

SPECIAL NOTES:

1. When administering a dopamine infusion, the appropriate drip rate should be monitored closely. Some sort of drip control should be used.
2. 5mcg/kg/min (renal dose) is not used to start correcting for hypotension, however these smaller doses may be titrated to in order to maintain appropriate blood pressure.
3. Protect medication from exposure to light.

REFERENCE GUIDELINE:

DRIP RATE CHART FOR DOPAMINE DRIPS

(400 mg dopamine in 250ml D5W or NS or 800 mg dopamine in 500ml D5W or NS =1600mcg/ml)

Dosage mcg/kg/min	1	1.5	2	2.5	3	3.5	4	5	6	7	8	9	10	15	20
Body weight (lbs & kg)	FLOW RATE IN ML/HR (In the absence of an IV pump, use minidrip tubing and ml/hr = drops/minute)														
22lb/10kg	1	1	1	1	1	1	2	2	2	3	3	3	4	6	8
33lb/15kg	1	1	1	2	2	2	2	3	3	4	5	5	6	8	11
44lb/20kg	1	1	2	2	2	3	3	4	5	5	6	7	8	11	15
55lb/25kg	1	1	2	2	3	3	4	5	6	7	8	8	9	14	19
66lb/30kg	1	2	2	3	3	4	5	6	7	8	9	10	11	17	23
77lb/35kg	1	2	3	3	4	5	5	7	8	9	11	12	13	20	26
88lbs/40kg	2	2	3	4	5	5	6	8	9	11	12	14	15	23	30
99lbs/45kg	2	3	3	4	5	6	7	8	10	12	14	15	17	25	34
110lbs/50kg	2	3	4	5	6	7	8	9	11	13	15	17	19	28	38
121lbs/55kg	2	3	4	5	6	7	8	10	12	14	17	19	21	31	41
132lbs/60kg	2	3	5	6	7	8	9	11	14	16	18	20	23	34	45
143lbs/65kg	2	4	5	6	7	9	10	12	15	17	20	22	24	37	49
154lbs/70kg	3	4	5	7	8	9	11	13	16	18	21	24	26	39	53
165lbs/75kg	3	4	6	7	8	10	11	14	17	20	23	25	28	42	56
176lbs/80kg	3	5	6	8	9	11	12	15	18	21	24	27	30	45	60
187lbs/85kg	3	5	6	8	10	11	13	16	19	22	26	29	32	48	64
198lbs/90kg	3	5	7	8	10	12	14	17	20	24	27	30	34	51	68
209lbs/95kg	4	5	7	9	11	12	14	18	21	25	29	32	36	53	71
220lbs/100kg	4	6	8	9	11	13	15	19	23	26	30	34	38	56	75
231lbs/105kg	4	6	8	10	12	14	16	20	24	28	32	35	39	59	79
242lbs/110kg	4	6	8	10	12	14	17	21	25	29	33	37	41	62	83
253lbs/115kg	4	6	9	11	13	15	17	22	26	30	35	39	43	65	86
264lbs/120kg	5	7	9	11	14	16	18	23	27	32	36	41	45	68	90

4.22 EPINEPHRINE 1MG/1ML

INDICATION:

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

PRECAUTIONS:

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

ADMINISTRATION:

1. Supplied in ampule or vial containing 1mg/ml.
2. Epinephrine 0.5 mg IM may be given. Pediatric dose is 0.01 mg/kg to a maximum of 0.5 mg IM, repeated every 15 minutes
3. Epinephrine push dose and drip can be utilized per section 5.42.

SPECIAL NOTES:

REFERENCE GUIDELINE:

*Allergic & Anaphylaxis
Cardiac Arrest
Bradycardia
Respiratory Distress
Shock*

This page updated 1/10/22

4.24 EPINEPHRINE 1MG/10ML

INDICATION:

1. All pulseless cardiac arrhythmias
2. Severe anaphylaxis

PRECAUTIONS:

1. May precipitate with sodium bicarbonate if tubing is not flushed between drugs.
2. May induce or exacerbate ventricular ectopy, especially in patients receiving digitalis.

ADMINISTRATION:

1. Cardiac arrest (V-fib, V-tach, asystole, PEA):
 - a. Administer 1mg epinephrine 1mg/10ml IV push and circulate with CPR. Pediatric dose is 0.01mg/kg IV/IO
 - b. Follow drug administration with defibrillation if indicated.
 - c. May repeat doses every 5 minutes if rhythm has not converted.
2. Severe anaphylaxis:
 - a. Administer 0.1 mg (1cc) of epinephrine 1mg/10ml IV every 5 minutes.

SPECIAL NOTES:

1. Expect that further physician orders for cardiac arrest may include varying dosing.
2. Given in conjunction with Vasopressin during cardiac arrest, and has a tendency to cause a higher number of shocks due to recurrent V-fib.

REFERENCE GUIDELINE:

*Allergy & Anaphylaxis
Cardiac Arrest
Bradycardia*

This page updated 1/10/22

4.26 FENTANYL CITRATE (SUBLIMAZE)

INDICATION:

1. Pain management

CONTRAINDICATIONS:

1. Hypersensitivity to opiates.
2. Myasthenia gravis

PRECAUTIONS:

1. Elderly patients
2. Respiratory depression
3. Increased ICP
4. Seizure disorders
5. Cardiac dysrhythmias
6. High doses given too quickly can cause respiratory muscle rigidity

ADMINISTRATION:

1. Supplied in a vial containing 100mcg/2ml.
2. Can be given IV/IO/IN/IM with a dose of 100 mcg given slowly over 1-2 minutes, every 5 min as needed; maximum 300 mcg. Pediatric dose 1mcg/kg IV/IO/IM and 2mcg/kg IN.
3. Reduce dose by 50% for smaller framed and elderly.
4. It has a rapid onset of 1-2 minutes and short duration.

PEDIATRIC CONSIDERATIONS:

1. Can be given intranasal route by attaching Mucosal Atomization Device (MAD).

SPECIAL NOTES:

1. Class II narcotic and your organizational drug control measures should be followed closely.

REFERENCE GUIDELINE:

Narrow Complex Tachycardia
Pain Management
Respiratory Distress
Wide Complex Tachycardia

4.28 GLUCAGON (GLUCAGEN)

INDICATION:

1. Suspected or known hypoglycemia in diabetic patients when IV access is not available.
2. Beta Blocker overdose.
3. Calcium channel blocker overdose.

PRECAUTIONS:

1. Relatively free of adverse reactions.
2. Occasional nausea and vomiting.
3. May cause transient increase in blood pressure and pulse rate.

CONTRAINDICATION:

1. Allergy or known hypersensitivity to glucagon.

ADMINISTRATION:

1. Obtain blood glucose measurement.
2. When no IV access is available, an initial dose of glucagon may be given.
3. 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).
4. Inject diluting solution into powdered glucagon vial. Shake gently until solution is clear.
5. Inject 1mg IM into deltoid, buttocks, or thigh. Pediatric dose 0.5mg IM.
6. Turn patient to one side in case vomiting should occur.
7. If the patient wakes up (5-15 minutes) and is able to swallow, give a fast acting carbohydrate such as orange juice or glucose gel immediately.
8. Repeat blood glucose measurement in 5 minutes.

SPECIAL NOTES:

1. For severe hypoglycemia (blood sugar <70 mg/dL), dextrose IV is treatment of choice.
2. For conscious patients, simple, oral carbohydrates are most effective.
3. If patient has already been given glucagon, a second dose may be given if still unconscious after 15 minutes.
4. Data shows that in an unconscious patient without IV access, glucagon is the best option.
5. If patients are comatose from diabetic ketoacidosis or very high blood sugars, glucagon will not worsen this situation to any significant degree.
6. Consultation with the monitoring physician is mandatory if considering non-transport after IM administration of glucagon.
7. For beta-blocker overdose adult 1–5mg IVP. Pediatric dose 0.1mg/kg max 1mg per dose IVP

REFERENCE GUIDELINE:

*Allergy & Anaphylaxis
Hypoglycemia
Toxic Exposure/Overdose*

4.30 GLUCOSE ORAL GEL OR TABLETS

INDICATION:

1. Suspected or known hypoglycemia patient that is able to tolerate PO.

PRECAUTION:

1. Airway must be carefully maintained.

ADMINISTRATION:

1. Perform blood glucose measurement.
2. Administer 1 tube (15-25g/tube) or have patient chew 4 tablets (4g/tablet).
3. Administer slowly, monitoring absorption. Maintain adequate airway.
4. Repeat blood glucose measurement in 5 minutes.

SPECIAL NOTES:

1. ALS services: In patients with blood sugars of < 70 mg/dl, IV dextrose and/or glucagon are considered first/second line treatment.
2. Many patients find glucose tablets much more palatable.
3. Consultation with the monitoring physician is mandatory if considering non-transport after oral glucose administration.

REFERENCE GUIDELINE:

*Hypoglycemia
Hypothermia & Frostbite*

4.32 HYDROMORPHONE (DILAUDID)

INDICATION:

1. Pain control

PRECAUTION:

1. Airway must be carefully maintained.

ADMINISTRATION:

1. Attach tubex or cabuject to pre-fill 1mg/1ml
2. Attach to needles port of IV tubing or attach needle for IM injection
3. Usual dose Adult 1 mg IV/IO/IM, may repeat in 10 minutes-max dose 4 mg
4. Monitor for respiratory depression & hypotension

SPECIAL NOTES:

1. Not to be used for pediatric patients
2. Burn patients may need higher doses
3. Reduce dose by 50% for smaller framed and elderly

REFERENCE GUIDELINE:

Pain control

This page updated 4/11/18

4.34 IPRATROPIUM BROMIDE (ATROVENT)

INDICATION:

1. Bronchospasm associated with chronic bronchitis, bronchial asthma, and emphysema.

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. *Having 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 medical control for use in patients under 3 years of age

CONTRAINDICATIONS:

1. Allergy or known hypersensitivity.
2. Hypersensitivity to atropine (chemically related).

ADMINISTRATION:

1. For bronchospasm that has already begun, Atrovent is used only in combination with albuterol.
2. Dosage for adults: Pour one unit dose bottle (0.5mg = 2.5ml of 0.02% solution) into nebulizer reservoir with one unit dose of albuterol.
3. Connect nebulizer to oxygen source at 6 liters per minute.
4. Have patient breathe as calmly, deeply, and evenly as possible until no more mist is found in the nebulizer chamber (5-15 minutes). An acceptable alternative to using the mouthpiece would be to attach the nebulizer reservoir to an oxygen mask, i.e. remove the bag from a non-rebreather nebulizer reservoir and do not use the T-piece or the mouthpiece. If a mask is used, adjust the mask to prevent mist from getting into the patients eyes.
5. One nebulizer treatment with Atrovent /albuterol may be given prior to contact with Medical Control. If further nebulization is indicated, albuterol-only nebs should be given.

PEDIATRIC CONSIDERATIONS:

1. Atrovent is not indicated in routine childhood asthma. Contact Medical Control if considering the use of Atrovent.

SPECIAL NOTES:

1. Nebulizer treatments for patients with active tuberculosis should be performed in well-ventilated areas (outside patient compartment if possible).

REFERENCE GUIDELINE:

*Asthma/COPD
Respiratory Distress*

4.36 KETAMINE (KETALAR)

INDICATION:

1. Sedation for RSA
2. Sedation for excited delirium
3. Pain control for extrication & severe burns
4. Agitated, combative

PRECAUTIONS:

1. Can cause respiratory depression
2. Can cause extra secretions in the airway
3. Can cause emergence reactions
4. Short acting effects

CONTRAINDICATIONS:

1. Cardiac decompensation
2. Congestive heart failure

ADMINISTRATION:

1. Adult/Ped – trauma extrication & severe burns 0.25mg/kg IV/IM (max dose 25mg)
2. Adult – excited delirium 4mg/kg IM (max dose 400mg)
3. RSA adult/peds – 2mg/kg (max dose 200mg). ½ dose may be repeated

SPECIAL NOTES:

1. For emergence reactions administer Versed 5 mg IVP
2. Reduce dose by 50% for smaller framed and elderly

REFERENCE GUIDELINE:

*Asthma/COPD
Respiratory Distress*

This page updated 1/10/22

4.37 LABETALOL (TRANDATE)

INDICATION:

1. Treatment of hypertension.

CONTRAINDICATIONS:

1. AV block - second or third degree.
2. Clinically significant bradycardia.
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. Digitalized patient (may potentiate AV conduction delay).

ADMINISTRATION:

1. Supplied in 100mg/20ml vial
2. Dose varies based on clinical condition, see relevant protocol, hold for bradycardia or hypotension.
3. Contact Medical Control if in doubt.

SPECIAL NOTES:

1. Life threatening: Severe bradycardia, hypotension, AV block, cardiac arrest, cardiac failure, respiratory distress and bronchospasm.
2. Other: Mild CNS depression, nausea/vomiting, and wheezing/dyspnea..

REFERENCE GUIDELINE:

Eclampsia

Hypertensive Crisis

Stroke

4.38 LIDOCAINE HYDROCHLORIDE 2%

INDICATION:

1. Reduce pain of EZ-IO infusion.

PRECAUTIONS:

1. Observe closely for symptoms of toxicity such as CNS problems and/or seizures.
2. In patients >70 years, dosage should be reduced to 0.5 mg/kg.
3. Lidocaine is contraindicated in dysrhythmias associated with cocaine use/abuse and hypothermia.

CONTRAINDICATION:

1. Allergy or known hypersensitivity to lidocaine.
2. High degree heart blocks
3. Cardiac Arrest

ADMINISTRATION:

1. Supplied as pre-loaded syringe containing 100mg/5ml.
2. Prior to bolus of lidocaine, flush the IO line to ensure patency, give 50mg slowly into IO extension set for conscious patient to reduce pain on infusion. After lidocaine is used to control infusion pain, an aggressive 10ml saline bolus flush is often required to improve IO flow rates. Peds dose is 0.5mg/kg maximum.

SPECIAL NOTES:

REFERENCE GUIDELINE:

IO

4.40 MAGNESIUM SULFATE 50%

INDICATION:

1. Ventricular tachycardia recurrent, Torsades de pointes, or persistent ventricular fibrillation.
2. Eclamptic seizures.
3. Status Asthmaticus.
4. Management of pre-term labor

PRECAUTIONS:

1. Use cautiously in patients with impaired renal function.
2. Use cautiously in pregnant women during labor.

CONTRAINDICATION:

1. Parenteral administration in patients with heart block, severe myocardial damage, or shock

ADMINISTRATION:

1. For Eclampsia, 4 grams IV/IO over 10 minutes.
2. For Status Asthmaticus, 2 grams IV/IO over 10 minutes.
3. Children should get a diluted solution and a dose of 50mg/kg over 10 minutes.

SPECIAL NOTES:

1. If rhythm is unresponsive to magnesium, consider other causes such as hypoxia, hypothermia.
2. Observe closely for symptoms of toxicity such as CNS depression, respiratory depression, symptoms of heart block, depressed reflexes and/or seizures.
3. If given too concentrated or too fast, it will cause flushing and feeling of heat.

REFERENCE GUIDELINES:

Asthma/COPD
Cardiac Arrest
Eclampsia
Respiratory Distress
Wide Complex Tachycardia

4.42 MARK I KIT

INDICATION:

1. Nerve agent chemical exposure
2. Organophosphate exposure

PRECAUTIONS:

1. Auto-injectors will go through clothes, but try and keep to a minimum, while ensuring speed of injection
2. Once injector is pulled from cap, it is activated. Do not place thumb over end.

CONTRAINDICATION:

1. None

ADMINISTRATION:

1. Supplied in two-pre-loaded, auto-injector syringes containing Atropine,

SPECIAL NOTES:

1. This kit is intended for self-rescue only.
2. Crewmember may also need full face protective mask to escape toxic environment.

REFERENCE GUIDELINES:

Toxic Exposure/Overdose

4.44 METHYLPREDNISOLONE SODIUM SUCCINATE (SOLUMEDROL)

INDICATION:

1. For the treatment of severe exacerbation of asthma, COPD, or in acute severe allergic reactions and anaphylaxis.
2. Cardiac arrest-neuroprotective.

PRECAUTIONS:

1. Relatively free of adverse reactions.

ADMINISTRATION:

1. It comes in an Act-O-Vial (125mg/2ml) that separates the white powder from the solute until ready to use.
2. 125 mg IV/IO/IM bolus may be given. Pediatric dose is 2 mg/kg IV/IO/IM bolus up to 125 mg maximum.

SPECIAL NOTES:

1. Methylprednisolone Sodium Succinate is the generic name.
2. Onset in about 30 minutes.

REFERENCE GUIDELINES:

*Allergy & Anaphylaxis
Asthma/COPD
Respiratory Distress
Cardiac Arrest*

This page updated 7/10/18

4.46 METOPROLOL TARTRATE (LOPRESSOR)

INDICATION:

1. In early treatment of acute myocardial infarction, treatment of angina and hypertension, it may reduce mortality by decreasing myocardial oxygen consumption.
2. Treatment of supraventricular tachyarrhythmia.

CONTRAINDICATIONS:

1. AV block - second or third degree.
2. Clinically significant bradycardia.
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. Digitalized patient (may potentiate AV conduction delay).

ADMINISTRATION:

1. Supplied in 5ml/5mg ampule
2. Dose varies based on clinical condition, see relevant protocol, hold for bradycardia or hypotension.
3. Contact Medical Control if in doubt about administering second and third doses or if patient has CHF, asthma, or COPD.

SPECIAL NOTES:

1. Life threatening: Severe bradycardia, hypotension, AV block, cardiac arrest, cardiac failure, respiratory distress and bronchospasm.
2. Other: Mild CNS depression, nausea/vomiting, and wheezing/dyspnea..
3. Metoprolol is not indicated in pediatric patients.

REFERENCE GUIDELINE:

4.48 MIDAZOLAM HYDROCHLORIDE (VERSED)

INDICATION:

1. Low dose Indicated for agitation and as a sedative prior to external pacing and cardioversion.
2. Low dose anxiolytic for CPAP.
3. To facilitate intubation.

PRECAUTIONS:

1. May cause mental, respiratory and cardiovascular depression(hypotension), more so than diazepam.
2. Be prepared to ventilate the patient and support the cardiovascular system.
3. Use with caution when used concomitantly with barbiturates, narcotics, and/or any other CNS depressants such as ETOH.

CONTRAINDICATION:

Allergy or known hypersensitivity.

ADMINISTRATION:

1. Usually supplied in vial(5mg/5ml).
2. For sedation prior to cardioversion or pacing, administer up to 2 mg IV over 2 minutes and titrate to effect.
3. For Seizure 0.1mg/kg IV/IO/IN(max 5mg bolus) or 0.2mg/kg IM(max 10mg bolus)
4. For sedation prior to intubation, administer 5 mg IV slowly over 1 minute. Pediatric dose is 0.1mg/kg to a maximum of 5 mg.
5. Versed is a controlled substance and its use must be documented according to each service Controlled Substance Policy.

SPECIAL NOTES:

1. Onset of action is more rapid, the drug is more potent, and is cleared faster than diazepam (Valium). Injection is also less irritating to veins than diazepam.
2. Can be administered by intranasal route using the MAD.

REFERENCE GUIDELINES:

Bradycardia
Seizures
Narrow Complex Tachycardia
Wide Complex Tachycardia
CPAP

This page updated 3/22/18

4.50 NALOXONE HYDROCHLORIDE (NARCAN)

INDICATION:

1. Therapeutic: reverses respiratory depression, depressed mental status, and miosis (pin-point pupils) caused by overdoses of the following narcotics: morphine, Demerol, heroin, codeine, oxymorphone (Numorphan), hydromorphone (Dilaudid), diphenoxylate (Lomotil), propoxyphene (Darvon), and pentazocine (Talwin).
2. Diagnostic: establishes that depressed mental status or respiratory status is due to one of the above drugs.

PRECAUTIONS:

1. In the chronic narcotic abuser, may precipitate withdrawal symptoms, miscarriage, pulmonary edema, or premature labor.
2. Very short half-life; monitor patient closely and prepare to re-dose if deterioration occurs.

CONTRAINDICATION:

1. Allergy or known hypersensitivity.

ADMINISTRATION:

1. Supplied as pre-loaded syringe containing 2mg/2ml or 0.4mg/ml 10ml vial.
2. An initial dose of 0.5-2 mg IV/IM/IN/IO may be given. Pediatric dose is 0.1 mg/kg IV/IO/IM/IN.

SPECIAL NOTES:

1. If no response after 2 mg, it is unlikely to be effective, proceed to advanced airway.
2. Remarkably safe and effective.
3. In cardiac arrest situations 2mg per dose is recommended.
4. Goal is adequate respirations, not to awaken patient fully.

REFERENCE GUIDELINE:

*Altered Level of Consciousness
Pain Management
Toxic Exposure/Overdose*

4.52 NITROGLYCERIN

INDICATION:

1. Chest pain of suspected cardiac origin.
2. Pulmonary edema.
3. STEMI transport to Cath Lab

PRECAUTIONS:

1. Headache and hypotension may occur after nitroglycerin (NTG) administration.
2. Do not administer if blood pressure is <100 systolic without IV in place.
3. Do not give to patients <12 years without a physician order.

CONTRAINDICATION:

1. Allergy or known hypersensitivity.
2. Viagra or other erectile dysfunction medications used recently.

ADMINISTRATION:

1. Initiate IV of NS TKO and obtain vital signs.
2. Give 0.4 mg (gr.1/150) NTG tablet or one metered dose NTG spray sublingually every 3-5 minutes as long as BP stays >100 systolic and patient has pain.
3. Apply NTG ointment 1" to left anterior chest after patient is pain free or if not initiating a nitro drip.
4. Nitro drip is started at 10 mcg/min and is used when an IV pump is available. (See chart below for drip rates).

NITROGLYCERINE DRIP RATE CHART
(50mg nitroglycerine in 250ml D5W or NS = 200mcg/cc)

Dosage mcg/min	10	20	30	40	50	60	70	80	90	100
FLOW RATE IN ML/HR (In the absence of an IV pump, use microdrip tubing and ml/hr = drops/minute)										
	3	6	9	12	15	18	21	24	27	30

SPECIAL NOTES:

1. Consider giving Fentanyl or Dilaudid if pain is unrelieved by NTG.
2. NTG is effective in relieving angina pectoris. Other conditions such as esophageal spasm can also respond well.

REFERENCE GUIDELINES:

Chest Pain
Congestive Heart Failure

4.54 ONDANSETRON HYDROCHLORIDE (ZOFRAN)

INDICATION:

1. Nausea and or vomiting.

PRECAUTIONS:

1. May cause headache and dizziness.
2. May cause sedation/drowsiness.
3. May prolong QT

ADMINISTRATION:

1. Supplied in vial containing 4mg/2ml.
2. Give adult patient 4mg IV slowly over 2 minutes into running IV may repeat every 15 minutes to a max dose of 8mg, pediatric patients <40kg 0.15mg/kg dose can be given and may repeat twice
3. Can be given IM or orally(ODT).
4. EMT Basic may only give ODT.

SPECIAL NOTES:

1. Very few side effects noted. If rare extrapyramidal effects are observed, Benadryl can be given.
2. Don't repeat adult dose if they have impaired renal function.
3. Use cautiously in nursing mothers.

REFERENCE GUIDELINE:

Nausea & Vomiting

This page updated 1/10/22

4.56 SODIUM BICARBONATE 8.4%

INDICATION:

1. Pre-existing metabolic acidosis or hyperkalemia.
2. Tricyclic overdoses.
3. Near-drowning.
4. Cocaine overdose with wide QRS.
5. ASA overdose.

PRECAUTIONS:

1. May cause hypernatremia and hyperosmolality.
2. Use of sodium bicarbonate in cardiac arrest is not usually indicated if adequate ventilation and effective chest compressions are performed.
3. May precipitate with epinephrine if tubing is not flushed between drugs.

ADMINISTRATION:

1. Supplied in pre-loaded syringe containing 50mEq/50ml.
2. Administer 1mEq/kg IV push as initial dose. Pediatric dose is the same as adult.
3. Repeat order is generally 0.5mEq/kg every 10 minutes thereafter.

SPECIAL NOTE:

1. Infant to 2 years old administration should include dilution to 4.2%.

REFERENCE GUIDELINE:

Cardiac Arrest
Toxic Exposure/Overdose

4.58 SUCCINYLCHOLINE CHLORIDE (ANECTINE)

INDICATION:

1. Facilitation of ET intubation.
2. Skeletal muscle relaxation.

CONTRAINDICATIONS:

1. Hypersensitivity
2. Malignant hyperthermia
3. Penetrating eye injury

PRECAUTIONS:

1. Pregnancy
2. Cardiac and respiratory disease
3. Burns greater than 24hrs
4. Glaucoma, eye surgery
5. Elderly or debilitated patients
6. Hyperkalemia

ADMINISTRATION:

1. Supplied in vial containing 200mg/10ml.
2. Adult dose: IV/IO/IM 2 mg/kg.
3. Pediatric dose: IV/IO/IM 2 mg/kg.
4. May repeat x1 if needed for RSA. Have Atropine available and treat per bradycardia guideline. Do not repeat for prolonged paralysis, proceed to Vecuronium if long acting agent needed.

SPECIAL NOTES:

1. Needs to be refrigerated.
2. Should not be given to children less than two years of age.
3. Expect possible muscle fasciculations.
4. Depolarizing neuromuscular blockade.

REFERENCE GUIDELINE:

Respiratory Distress

4.60 VASOPRESSIN (PITRESSIN)

INDICATION:

1. May transport healthcare facility initiated drip

CONTRAINDICATIONS:

1. Pediatrics (at this time, Vasopressin is used in Adult Cardiac Arrest only).

ADMINISTRATION:

1. Supplied in vial containing 20units/1ml.
2. Dose is 40 units IV/IO.
3. If no response after 10 minutes, you may repeat dose.

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:

Cardiac Arrest

4.62 VECURONIUM BROMIDE (NORCURON)

INDICATION:

1. Facilitation of ET intubation.
2. Skeletal muscle relaxation.

CONTRAINDICATIONS:

1. Hypersensitivity

PRECAUTIONS:

1. Cardiac, respiratory, neuromuscular, or liver disease
2. Pregnancy
3. Dehydration

ADMINISTRATION:

1. Supplied in vial in powder form 10mg or 20mg. Reconstitute with normal saline.
2. Give 0.1 mg/kg IV (max dose 10mg) in order to maintain paralysis. Should last >30 minutes.

SPECIAL NOTES:

1. Nondepolarizing neuromuscular blocker.
2. Should not be given to children less than two years of age.
3. Adult dose given for children nine years and older.

REFERENCE GUIDELINES:

Respiratory Distress

4.64 CYANIDE ANTIDOTES

Indications and Usage:

- If clinical suspicion of cyanide poisoning is high, Cyanide antidote should be administered without delay.
- 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.

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

Cyanokit

Do not use below with CO/smoke exposure:

Cyanide Package/Antidote Kit

Nithiodote

4.66 TETRACAINE

INDICATION:

Temporary relief of pain due to corneal abrasion, foreign body, or burns to eyes.

CONTRAINDICATIONS:

Open globe rupture.

PRECAUTIONS:

Once drops are placed, be sure patient does not rub eyes.

ADMINISTRATION:

Two drops per effected eye. May repeat in 5-10 minutes x4.

SPECIAL NOTES:

REFERENCE GUIDELINE:

Trauma

Eye Irrigation

4.68 TRANEXAMIC ACID (TXA)

Class: Anti-Fibrinolytic

Actions/Pharmacodynamics:

Decreases clot breakdown in the setting of massive hemorrhage.

Indications:

Hemostatic Agents

Patients in hemorrhagic shock with suspected need for massive blood transfusion (clinical evidence of marked blood loss – internal or external, sustained tachycardia and hypotension) within 3 hours of injury time.

Traumatic Brain Injury

Contraindications:

Non-hemorrhagic shock (septic/spinal/cardiogenic)

Pharmacokinetics:

Onset of action within 4 hours after IV administration, exact time of onset unclear and variable.

Delayed effects up to 48 hours consistent with anti-inflammatory actions.

Side Effects:

While a theoretical concern, TXA has not been shown to cause significant increase in deep venous thrombosis, pulmonary embolism, myocardial infarction, or stroke in published trials to date.

Dosage:

30mg/kg IV/IO (max dose 2G) over 20 minutes. Administer in 100mL or 250mL NS.

How Supplied:

1 gram/10mL vial or ampule (100mg/mL)

(Always check concentration and dose per container at time of patient medication administration)

This page updated 1/10/22

4.70 ROCURONIUM BROMIDE (ZEMURON)

INDICATION:

Facilitation of ET intubation.
Skeletal muscle relaxation.

CONTRAINDICATIONS:

Hypersensitivity

PRECAUTIONS:

Cardiac, respiratory, neuromuscular, or liver disease
Pregnancy
Dehydration

ADMINISTRATION:

Supplied in 50mg vial.
Give 1 mg/kg IV/IO (max dose 100mg) in order to maintain paralysis. Should last >30 minutes.

SPECIAL NOTES:

Nondepolarizing neuromuscular blocker.

REFERENCE GUIDELINES:

Respiratory Distress

4.72 OXYTOCIN (PITOCIN)

INDICATION:

Stimulates post-partum contraction of the uterus to control bleeding

May transport healthcare facility initiated drip

CONTRAINDICATIONS:

Hypersensitivity

PRECAUTIONS:

Hypertension, tachycardia, dysrhythmias

ADMINISTRATION:

10-40 units added to 1000ml IV fluid to control hemorrhage

Usual rate is 10-20 milliunits/minutes

SPECIAL NOTES:

Use infusion pump

Monitor heart rhythm

Check BP frequently; vital sign monitor recommended

Contact medical control for any adverse effects

REFERENCE GUIDELINES:

4.74 ETOMIDATE (AMIDATE)

INDICATION:

Sedation prior to paralysis for rapid sequence airway

Intravenous injection of etomidate produces hypnosis characterized by a rapid onset of action

Duration of hypnosis is relatively brief, usually three to five minutes

CONTRAINDICATIONS:

Hypersensitivity

Do not use under age 10

PRECAUTIONS:

May cause skeletal muscle movements and masseter muscle spasm

ADMINISTRATION:

0.3mg/kg IV/IO to maximum of 40mg

SPECIAL NOTES:

Administer oxygen

Only give when all equipment and personnel are ready for intubation

Monitor heart rhythm, pulse oximetry

Check BP frequently; vital sign monitor recommended

Be prepared with analgesia/sedation after intubation due to short half life

Contact medical direction for any adverse effects or concerns

REFERENCE GUIDELINES:

This page updated 1/18/22

SECTION 5 MERCY EMS REFERENCE MATERIALS

5.2 END-TIDAL CO₂

CAPNOGRAPHY

EDUCATIONAL SERIES

End-tidal CO₂ (EtCO₂) is the measurement of carbon dioxide (CO₂) in the airway at the end of each breath. Capnography provides a numeric reading (amount) of the EtCO₂ and a graphic display (waveform) of CO₂ throughout the respiratory cycle.

CO₂, produced by cells, is transported via the vascular system and diffused into the alveoli to be exhaled. PaCO₂, the partial pressure of CO₂ in arterial blood, is normally 2–5mmHg higher than EtCO₂ in the airway.



Capnography • Intubated Patient

Applications on intubated patients:

- Verification of ET tube placement
- Monitoring and detection ET tube dislodgment
- Loss of circulatory function
- Determination of adequate CPR compressions
- Confirmation of return of spontaneous circulation

Examples:

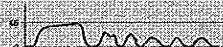
Sudden loss of waveform, EtCO₂ near zero

- ET tube disconnected, dislodged, kinked or obstructed.
- Loss of circulatory function



Decreasing EtCO₂ with loss of plateau

- ET tube cuff leak or deflated cuff
- ET tube in hypopharynx
- Partial obstruction



CPR Assessment

- Attempt to maintain minimum of 10mmHg



Sudden increase in EtCO₂

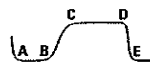
- Return of spontaneous circulation



Normal Ranges:

Arterial PaCO₂ 38–45mmHg
Airway EtCO₂ 35–45mmHg (4–6 Vol. %)

Normal Waveform:



- A-B Respiratory baseline
- B-C Expiratory upslope
- C-D Expiratory plateau
- D End-tidal value—peak CO₂ concentration—at the end of exhalation
- D-E Inspiratory downstroke



Applications:

Capnography is an objective monitoring tool for patients in respiratory distress and patients undergoing procedural sedation. It may be used to confirm, monitor and document ET tube intubation. A nasal-oral cannula is used to assess, monitor and document the respiratory status of the non-intubated patient. EtCO₂ monitoring with LIFEPAK defibrillator/monitors may be used on patients of any age.

Monitoring and Printing:

Capnography waveforms on the monitor screen are condensed to provide adequate information in the 4-second view. The correct respiratory rate is displayed in breaths per minute (bpm). Printouts of the waveforms are in real time and therefore may differ in duration.

Note:

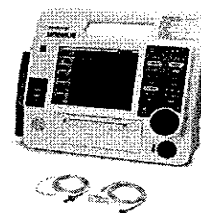
Examples are illustrations for training purposes. Level of sedation and severity of condition may affect respiratory rate and EtCO₂ level in patients.

Troubleshooting Tips for EtCO₂ Monitoring with LIFEPAK defibrillator/monitors:

Observation	Possible Cause
ALARM APNEA message appears.	No breath has been detected for 30 seconds since last valid breath (>8mmHg).
CO ₂ FILTERLINE OFF message appears.	FilterLine® disconnected or not securely connected.
CO ₂ FILTERLINE BLOCKAGE message appears.	FilterLine is twisted or clogged. Airway adapter clogged.
CO ₂ FILTERLINE PURGING message appears.	FilterLine tube twisted or clogged, or rapid altitude change occurred.
EtCO ₂ values are erratic.	Leak in the tubing. Ventilated patient breathes spontaneously.
EtCO ₂ values are consistently higher or lower than expected.	Physiological cause. Ventilator malfunction. Improper calibration.
xxx appears in place of EtCO ₂ value.	CO ₂ module not calibrated successfully, or CO ₂ module fails.

The LIFEPAK® 12 defibrillator/monitor with Microstream® capnography provides the most versatility and ease of use:

- Superior moisture handling eliminates need for water traps or additional filters
- No calibration required between patients
- Does not require user corrections or compensation for commonly used gasses (O₂, N₂O, etc.)



Capnography • Non-intubated Patient

Applications on non-intubated patients include:

- Assessment of asthma and COPD
- Documented monitoring during procedural sedation
- Detection of apnea or inadequate breathing
- Measurement of hypoventilation
- Evaluation of hyperventilation

Examples:

Plateau has curved, "shark-fin" appearance

- Asthma
- COPD



Slow rate with increased EtCO₂

- Hypoventilation
- Partial airway obstruction



Rapid rate with decreased EtCO₂

- Hyperventilation



Decreased EtCO₂, variable waveform

- Apnea, inadequate breath
- Sedation



5.4 CPAP

- **INDICATIONS** – Any patient who is complaining of shortness of breath for reasons other than pneumothorax and:
 - Is awake and oriented.
 - Are over 12 years old and is able to fit the CPAP mask.
 - Has the ability to maintain an open airway (GCS > 10).
 - Has a respiratory rate \geq 25 breaths per minute.
 - Has a systolic blood pressure above 90 mmHg.
 - Note: CPAP decreases preload, which make the blood pressure drop
 - Using accessory muscles of respiration with SPO₂ <94%
 - Signs and symptoms are consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia.
- **CONTRAINDICATIONS**
 - Patient is in respiratory arrest.
 - BP < 90 mmHg
 - Heavy oral secretions or vomiting
 - Patient is suspected of having a pneumothorax.
 - Patient has a tracheotomy.
 - Major trauma
- **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 gastric surgery
 - Complains of nausea (remove if vomiting begins)
 - Inadequate respiratory effort
 - Excessive secretions
 - Facial deformity that prevents the use of CPAP
- **ALTERNATIVE** – Intubation should be performed if:
 - Respiratory or cardiac arrest
 - Unresponsive to verbal stimuli (GCS is < 9) and loss of gag reflex
 - EMR, EMT may use a non-visualized airway
 - Paramedics may use an endotracheal tube
- **PROCEDURE:**
 - Make sure patient does not have a pneumothorax!
 - EXPLAIN THE PROCEDURE TO THE PATIENT
 - Ensure adequate oxygen supply to ventilation device (100% when starting therapy and until SpO₂ is >95%)
 - Place the patient on continuous pulse oximetry and EtCO₂
 - Place the delivery device over the mouth and nose
 - Secure the mask with provided straps or other provided devices
 - Use 5 cm H₂O of PEEP to start and titrate to effect up to 15 cm H₂O.

- 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
- **REMOVAL PROCEDURE:**
- CPAP therapy needs to be continuous and 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.

5.6 12 LEAD ACQUISITION AND TRANSMISSION

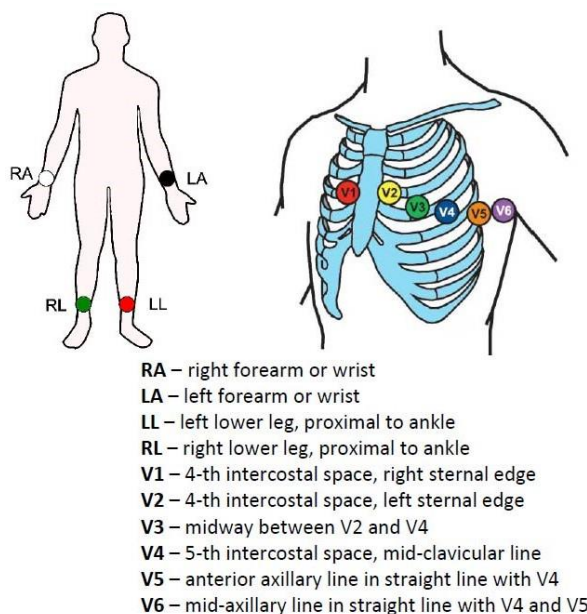
Early prehospital 12-Lead ECGs will decrease the time to percutaneous coronary intervention (PCI) for patients with acute ST segment elevation myocardial infarctions (STEMI). 12-Lead ECGs done by EMTs are a non-diagnostic skill and must be interpreted by Paramedic or transmitted for interpretation.

Indications

1. Chest pain, pressure or discomfort suggestive of acute coronary syndrome
2. Acute onset of dyspnea suggestive of congestive heart failure
3. Syncope, generalized weakness, or altered level of consciousness
4. New onset of cardiac dysrhythmia (palpitations, irregular heart rate, <60 or >120)

Procedure

1. Apply O2, if not already in place by First Responder
2. Place the patient in a supine position or semi-fowler if orthopnea
3. Explain the procedure, its importance and get consent
4. One crewmember prepares patient while the other prepares monitor
5. Bare the chest and wipe skin, if female ensure privacy
6. Turn on monitor and connect precordial leads to 5-lead monitoring cable
7. Attach electrodes to all ten leads and place limb leads (not on torso)
8. As one partner finds anatomical location by palpating 2nd, 3rd, and 4th intercostal space, and the other peels backing off and hands electrode to partner.
9. 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
10. Do not place V3-V6 on the breast, place underneath. Ask patient to lift left breast or use the back of your hand,
11. Press "12 Lead" Softkey and enter patient age and gender, encourage patient to remain still as 12-Lead is being aquired.
12. A copy will automatically print. If printout states *****ACUTE MI SUSPECTED*****, call for ALS transport to closest hospital follow Chest Pain *guideline*.



Special Notes

1. In most cases the 12-Lead ECG should be done before moving the patient. Perform before treatments except oxygen and vital signs. Attempt supine position, but if patient has increased work of breathing, move to semi-fowler or then sitting.
2. If in a public place and patient privacy cannot be maintained move to ambulance quickly. Even in the home, be sensitive to female patient's privacy. Have extra responders do something away from patient to improve privacy. Use a towel to cover female patient and work from top and bottom of folded towel. If you assist in moving breast, use the back of your straight hand not the palm.
3. Acquiring a 12-Lead ECG should not normally prolong scene time more than two or three minutes, and this procedure should be performed concurrently with other assessment and care.
4. Whenever a 12-Lead ECG is performed, present a copy to the ED, even if normal.
5. It is important to transmit an *****ACUTE MI SUSPECTED***** to ED physician as soon as possible with the patient's choice of cath lab.
6. If *****ACUTE MI SUSPECTED*****, tell the patient they may be having a heart attack and recommend they choose the most appropriate facility for PCI. Pass their choice on to the ED with the radio report. Do not tell them they are not having a heart attack if the ECG reads normal. The ED physician will need to determine this.
7. Reduce causes of artifact:
 - a. Avoid placing electrodes on large muscle mass
 - b. Avoid placing electrodes on boney prominences
 - c. Ensure limbs are relaxed resting on firm surface
 - d. Don't let electrodes dry out
 - e. Don't press in the center of the electrode, or touch the gel in center
 - f. Abrade skin by wiping briskly with alcohol and gauze pad
 - g. Excessive hair may have to be clipped
8. Attach all 12-Lead ECGs to WARDS record.

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To Transmit a 12-Lead ECG on the MRx

1. Push "Menu Select, √" located on bottom in the middle
2. Select "Send", from drop down menu
3. Select the appropriate site
4. To Transmit a 12-lead ECG on other manufacturers follow manufacturer guidance.

Print a Copy from Data Management

1. Push "Menu Select, √" located on bottom in the middle
2. Select "Other" from menu
3. Select "Data Management" from menu
4. Select "Acknowledge" to exit monitoring and close patient record
5. Select "Report" by using "Next Item" or "Previous Item"
6. Select "Print" from drop down menu

5.8 CENTRAL IV LINES

These devices should not be accessed by EMS providers other than a code situation. Otherwise they are only to be utilized if already accessed by hospital, dialysis center, or if IV/IO access is unavailable. All ports must be extensively cleansed with alcohol prep prior to use.

Central IV lines flow through a catheter with its tip within a large vein, usually the superior vena cava or inferior vena cava, or within the right atrium of the heart. This has several advantages over a peripheral IV:

- It can deliver fluids and medications that would be overly irritating to peripheral veins because of their concentration or chemical composition. These include some chemotherapy drugs and total parenteral nutrition.
- Medications reach the heart immediately, and are quickly distributed to the rest of the body.
- There is room for multiple parallel compartments (lumens) within the catheter, so that multiple medications can be delivered at once even if they would not be chemically compatible within a single tube.
- Caregivers can measure central venous pressure and other physiological variables through the line.

Central IV lines carry higher risks of bleeding, bacteremia, and gas embolism (see Risks below).

There are several types of central IVs, depending on the route that the catheter takes from the outside of the body to the vein

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Indications for the use of central lines include:

- Monitoring of the central venous pressure (CVP) in acutely ill patients to quantify fluid balance
- Parenteral nutrition
- Drugs that are prone to cause phlebitis in peripheral veins (caustic), such as:
 - Calcium gluconate
 - Chemotherapy
 - Potassium chloride
 - Amiodarone
- Need for intravenous therapy when peripheral venous access is impossible
 - Blood
 - Medication
 - Rehydration

Possible problems

Infection

It is possible for an infection to develop either inside the central line or around the exit site. You should contact the accepting facility if:

- the exit site becomes red or swollen
- you notice discoloured fluid coming from it
- the patient develops a temperature

Clots

It is possible for a blood clot (thrombosis) to form in the vein at the tip of the line. The patient may be given an anticoagulant to take each day to help prevent this. If a clot does form the line may have to be removed.

Air in the central line

No air must be allowed to get into the central line. The clamps should always be closed when the line is not in use. The line must not be left unclamped when the caps are not in place.

Break or cut in the line

It is important that you do not get a break or cut in the line. Do not use scissors near the line and only use the clamp on the thicker, strengthened part of the line. If the line does get cut or split, try to clamp the line above the cut and call medical control and the accepting facility. The line may need to be removed by the hospital if it cannot be repaired while still in place.

Peripherally inserted central catheter (PICC)

A PICC is a long, thin, flexible tube known as a catheter. It is inserted into one of the large veins of the arm near the bend of the elbow. It is then pushed into the vein until the tip sits in a large vein just above the heart.

The space in the middle of the tube is called the lumen. Sometimes the tube has two or three lumens (known as double or triple lumen). This allows different treatments to be given at the same time. At the end of the tube outside the body, each lumen has a special cap to which a drip line or syringe can be attached. There is also a clamp to keep the tube closed when it is not in use.

A PICC line is inserted into a peripheral vein, usually in the arm, and then carefully advanced upward until the catheter is in the superior vena cava or the right atrium. This is usually done by feel and estimation; an X-ray then verifies that the tip is in the right place.

A PICC may have two parallel compartments, each with its own external connector (double-lumen), or a single tube and connector (single-lumen). From the outside, a single-lumen PICC resembles a peripheral IV, except that the tubing is slightly wider.

The insertion site must be covered by a larger sterile dressing than would be required for a peripheral IV, due to the higher risk of infection if bacteria travel up the catheter. However, a PICC poses less of a systemic infection risk than other central IVs, because bacteria would have to travel up the entire length of the narrow catheter before spreading through the bloodstream.

The chief advantage of a PICC over other types of central lines is that it is easy to insert, poses a relatively low risk of bleeding, is externally unobtrusive, and can be left in place for months to years for patients who require extended treatment. The chief disadvantage is that it must travel through a relatively small peripheral vein and is therefore limited in diameter, and also somewhat vulnerable to occlusion or damage from movement or squeezing of the arm.

Implantable ports

A *port* (often referred to by brand names such as Port-a-Cath or *MediPort*) is a central venous line that does not have an external connector; instead, it has a small reservoir implanted under the skin. Medication is administered intermittently by placing a small needle through the skin into the reservoir. Ports cause less inconvenience and have a lower risk of infection than PICCs, and are therefore commonly used for patients on long-term intermittent treatment.

Medications:

Any medication that can be given via peripheral IV line can be given via Central Line or PICC Line. Always flush the medication with 5cc of saline prior to administration of a medication and flush with 20cc of saline after the medication administration.

If the medications are incompatible with an IV line or incompatible when mixed with another medication, do not use in a PICC line or a Central Line.

Training:

Each paramedic will be required to attend a training class on the use and care for PICC lines and central lines.

This training will consist of management and care of the PICC and Central Lines and how to recognize a problem including the possible break in the line.

The Medical Director or their approved training person will conduct this class prior to the paramedic being able to manage these lines.

5.10 EZ-IO PLACEMENT

Training:

EZ-IO® infusion systems require specific training prior to use.

Site locations: Paramedic – Proximal Humerus(Adult Only), Proximal Tibia(Adult and Large Child), Distal Femur(Infant/Child Only)

INDICATIONS:

EZ-IO® 25mm (40 kg and over) & EZ-IO® 15mm (3–39 kg) EZ-IO® 45mm (40 kg and over with excessive tissue)

For adults and pediatrics anytime in which vascular access is difficult to obtain in emergent, urgent or medically necessary cases.

CONTRAINDICATIONS:

- Fracture of the bone selected for IO infusion (*consider alternate sites*)
- Excessive tissue at insertion site with the absence of anatomical landmarks (*consider alternate sites*)
- Previous significant orthopedic procedures (*IO within 24 – 48 hours, prosthesis - consider alternate sites*)
- Infection at the site selected for insertion (*consider alternate sites*)

CONSIDERATIONS:

Flow rate: Ensure the administration of a rapid and vigorous 10ml flush with normal saline prior to infusion “**NO FLUSH = NO FLOW**” Repeat syringe bolus (flush) as needed

Pediatrics: For EZIO insertions on patients less than one (1) month old, use 15mm needle and insert by hand. Do not use the driver for insertion.

Pain: Paramedic 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 very slowly until the desired anesthetic effect is achieved.

EQUIPMENT:

- One (1) EZ-IO Power Driver
- Appropriate size intraosseous Needle Set based on patient size and weight
- EZ-IO 15mm 3-39 kg
- EZ-IO 25mm 40kg and greater
- EZ-IO 45mm 40kg and greater with excessive tissue
- One (1) EZ-Connect®
- Two (2) 10 ml syringes
- Sterile saline solution for flush **Note:** Paramedic may consider 2% lidocaine without preservative 50mg slowly **over 3-5 minutes**
- Non-sterile non-latex gloves
- Antiseptic agent per institution guideline
- One (1) semi-permeable transparent dressing (optional)
- One (1) sterile 2x2 or 4x4 gauze pad
- One (1) (appropriate volume and type) intravenous solution
- One (1) fluid administration set (institution specific)
- One (1) fluid administration pump or pressure bag (institution specific)
- EZ-IO wrist band

PROCEDURE: *If the patient is conscious, explain procedure*

- Apply non-sterile latex free gloves
- Cleanse site using antiseptic agent per institution guideline
- Allow to air dry thoroughly
- Connect appropriate Needle Set to driver
- Stabilize site
- Remove needle cap
- Insert EZ-IO needle into the selected site. **IMPORTANT:** Keep hand and fingers away from Needle Set
- Position the driver at the insertion site with the needle set at a 90-degree angle to the bone surface.

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- Gently pierce the skin with the Needle Set until the Needle Set tip touches the bone.
- Ensure visualization of at least one black line on Needle Set
- 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.
 - *In the unlikely event that the battery on the Driver fails clinicians may manually finish inserting the EZ-IO Needle Set. Grasp the Needle Set and, rotate arm, while pushing the needle into the intraosseous space. This may take several minutes.
- On adult patients when accessing the tibia using the 25mm Needle Set or the proximal humerus using the 45mm Needle Set, you may stop by releasing the trigger when the hub is almost flush with the skin.
- On pediatric patients when you feel a decrease in resistance indicating the Needle Set has entered the medullary space, release the trigger.
- Remove EZ-IO Power Driver from Needle Set while stabilizing the catheter hub
- Remove stylet from catheter by turning counter-clockwise and immediately dispose of stylet in appropriate biohazard sharps container
 - ***NEVER** return used stylet to the EZ-IO kit
- Connect primed EZ-Connect to exposed Luer-lock hub
- Confirm placement
- Syringe bolus: flush the catheter with 10 ml of normal saline
 - * If the patient is responsive to pain, the paramedic may consider 2% lidocaine without preservatives 50mg slowly over 3-5 minutes for anesthetic effect prior to the 10ml normal saline flush
- Assess for potential IO complications
- Disconnect 10 ml syringe from EZ-Connect extension set
- Secure IO as needed
- Connect primed EZ-Connect extension set to primed IV tubing
- Begin infusion utilizing a pressure delivery system if needed
- Secure tubing per institution policy
- Continue to monitor extremity for complications
- Place EZ-IO armband on patient, document time and date

5.12 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



1

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.



3



5



6



8

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



Wolfe Tory Medical, Inc.
www.wolfetory.com
 Toll Free: 888-380-9808

5.14 KED USE FOR HIP FRACTURES

Model 125 KED

Special Situations

6.6 Adapting the KED for Use As a Splint

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

The KED and patient are placed on a long spine board with the head portion of the KED toward the foot end of the board.

The torso portion of the is KED positioned a little above the waist and centered (Figure 44). 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 (Figure 44).



*Figure 44 - Stabilizing the
Hip and/or Femur*

PELVIC STABILIZATION

The KED and patient are placed on a long spine board with the head portion of the KED toward the foot end of the board.

The torso portion of the is 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 the patient's legs and secured with the KED head straps (Figure 45).



Figure 45 - Stabilizing the Pelvis

5.16 SPINAL ASSESSMENT AND SELECTIVE IMMOBILIZATION

Patients with blunt traumatic injuries with mechanism concerning for spinal injury should be assessed for spinal injury. Patients may have all spinal immobilization omitted if ALL of the following conditions apply:

- They are conscious, cooperative and able to communicate effectively with provider^{2,3,4}.
- There is no major mechanism for severe injury² (i.e. No prehospital trauma triage criteria to go to a high level trauma center.)
- Have no history of new or temporary neurologic deficit such as numbness or weakness in an extremity^{1,2,3}.
- Have no evidence of intoxication or altered mental status^{1,2,3,5}.
- Have no evidence of a distracting injury^{1,3} such as
 - Fractures
 - Major burns
 - Crush injuries
 - Severe or distracting pain
 - Have no midline back or neck pain or tenderness upon palpation^{1,2,3}.

If all the above criteria are met, have patient move their neck 45° to either side of midline, flex, and extend neck, and if still no pain², no immobilization is indicated. Document exam findings.

Spinal immobilization consists of keeping the head, neck and spine inline. The neck can be immobilized with a well fitted cervical collar. Patients who are already walking or standing should be laid directly on the ambulance stretcher and secured to the stretcher with seatbelts. Back boards and scoop stretchers are designed and should only be used to extricate patients. Once extricated, patients should be taken off the back board or scoop stretcher and be placed directly on the ambulance stretcher. In situations where extrication is not needed, use a sheet with adequate personnel to move any non-ambulatory patient. Keep spine in neutral position.

Infants can be left in an intact car seat as a method of immobilization. Infants can't describe pain, and therefore cannot have their c-spine cleared with selective immobilization. Utilize blanket or towel rolls to immobilize child's head from moving in car seat. If child is too large for car seat, utilize appropriate size c-collar.

Patients with penetrating traumatic injuries should only be immobilized if a focal neurologic deficit is noted on physical examination (although there is little evidence of benefit even in these cases).

Decisional patients have the right to refuse aspects of treatment including spinal immobilization. If a patient refuses immobilization after being informed of possible permanent paralysis, do not immobilize them and document the patient's refusal in your medical record.

² Hoffman JR et al. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. *N Engl J Med* 2000; 343:94-99.

³ Stiell IG et al. The Canadian C-spine rule for radiography in alert and stable trauma patients. *JAMA* 2001; 286:1841-1848.

⁴ Burton JH et al. A Statewide, Prehospital Emergency Medical Service Selective Patient Spinal Immobilization. *J Trauma* 2006; 61: 161-167.

⁵ Evaluation for evidence of intoxication: Ask "What medications did you take today? Have you had any alcohol? Have you had any recreational drugs?" Is there slurring of speech, dilated or constricted pupils, unsteady gait? Do they smell like alcohol or marijuana?

5.18 MECHANICAL CPR

This procedure describes the appropriate methods to apply, operate, and discontinue the LUCAS device in patients requiring mechanical chest compression related to cardiac arrest.

Indications

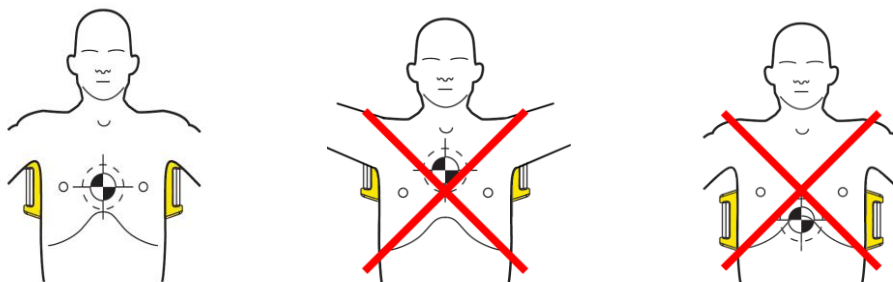
1. The LUCAS may be used in patients being treated as adults where manual compressions would otherwise be used.

Contraindications

1. Pediatrics
2. Patients who do not fit within the device.
 - a. Patients who are too large and LUCAS device alarms
 - b. Patients who are too small and with whom you cannot pull the pressure pad down to touch the sternum and LUCAS device alarms

Guideline for Placement

1. All therapies related to the management of cardiopulmonary arrest should be continued as currently defined
2. Initiate resuscitative measures following guidelines
 - a. Early defibrillation should be considered and provided as indicated based on clinical presentation.
 - b. Manual chest compressions should be initiated *immediately* while the LUCAS device is being placed on the patient.
 - c. Limit interruptions in chest compressions.
 - d. Do not delay manual CPR for the LUCAS. Continue manual CPR until the device can be placed.
3. While resuscitative measures are initiated, the LUCAS device should be removed from its carrying device and placed on the patient in the following manner. The backplate should be centered on the nipple line and the top of the backplate should be located just below the patient's armpits

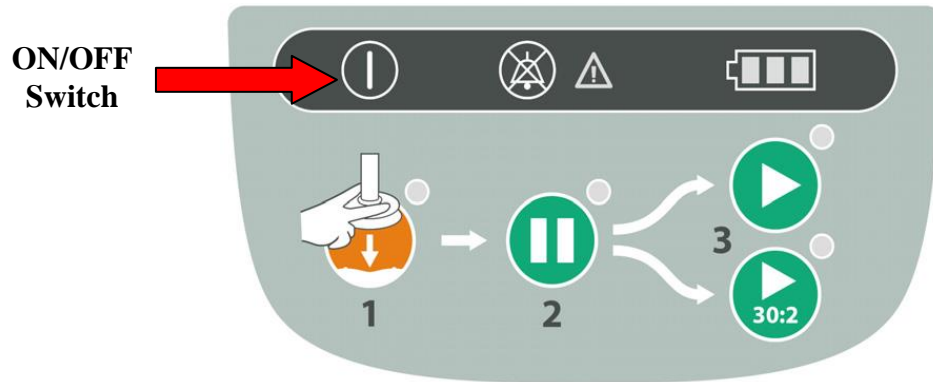


In cases for which the patient is already on the stretcher, place the backplate underneath the thorax. This can be accomplished by log-rolling the patient or raising the torso (Placement should occur during a scheduled discontinuation of compressions).

This page updated 10/24/18

Position the Compressor

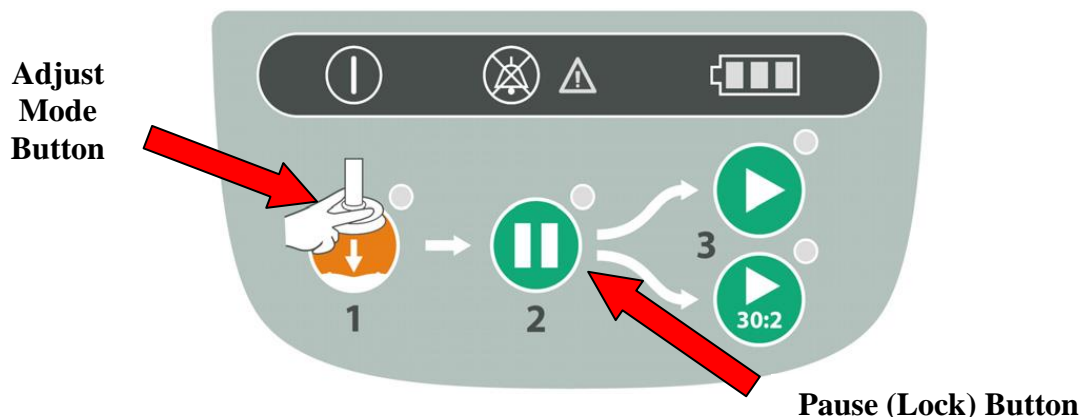
- Turn the LUCAS Device on (the device will perform a 3 second self-test).



- Remove the LUCAS device from its carrying case using the handles provided on each side.
- With the index finger of each hand, pull the trigger to ensure the device is set to engage the backplate. Once this is complete, you may remove your index finger from the trigger loop.
- Approach the patient from the side opposite the person performing manual chest compressions.
- Attach the claw hook to the backplate on the side of the patient opposite that where compressions are being provided.
- Place the LUCAS device across the patient, between the staff member's arms who is performing manual CPR.
- At this point the staff member performing manual CPR stops and assists attaching the claw hook to the backplate on their side.
- Pull up once to make sure that the parts are securely attached.

Adjust the Height of the Compression Arm

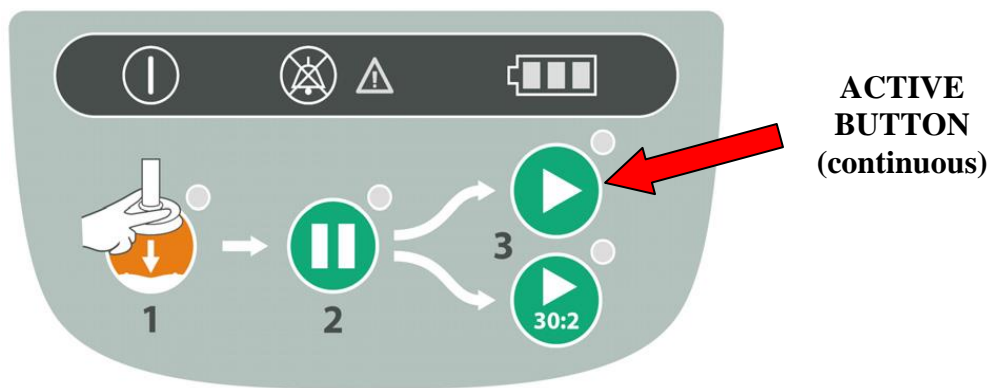
- Use two fingers (V pattern) to make sure that the lower edge of the Suction Cup is immediately above the end of the sternum. If necessary, move the device by pulling the support legs to adjust the position
- Press the Adjust Mode Button on the control pad labeled #1 (This will allow you to easily adjust the height of the compression arm).



- To adjust the start position of the compression arm, manually push down the SUCTION CUP with two fingers onto the chest (without compressing the patient's chest)
- Once the position of the compression arm is satisfactory, push the green PAUSE button labeled #2 (This will lock the arm in this position), then remove your fingers from the SUCTION CUP.
- If the position is incorrect, press the ADJUST MODE BUTTON and repeat the steps.

Start Compressions

- Provide continuous compressions push ACTIVE (continuous) button



Patient Adjuncts

- Place the neck roll behind the patient's head and attach the straps to the LUCAS device.
 - This will prevent the LUCAS from migrating toward the patient's feet.
- Place the patients arms in the straps provided.

Using the LUCAS during the Resuscitation

Defibrillation

- Defibrillation can and should be performed with the LUCAS device in place and in operation
- One may apply the defibrillation electrodes either before or after the LUCAS device has been put in position
 - The defibrillation pads and wires should not be underneath the suction cup
 - If the electrodes are already in an incorrect position when the LUCAS is placed, you must apply new electrodes

- Defibrillation should be performed according to guidelines and following the instructions of the defibrillator manufacturer.
- If the rhythm strip cannot be assessed during compressions, one may stop the compressions for analysis by pushing the PAUSE BUTTON (The duration of interruption of compressions should be kept as short as possible. There is no need to interrupt chest compressions other than to analyze the rhythm).
- Once the rhythm is determined to require defibrillation, the appropriate ACTIVE BUTTON should be pushed to resume compressions while the defibrillator is charging and then the defibrillator should be discharged.

Pulse Checks/Return of Spontaneous Circulation (ROSC)

- Pulse checks should occur intermittently while compressions are occurring
- If the patient moves or is obviously responsive, the LUCAS Device should be paused and the patient evaluated.
- If there is a change in rhythm, but no obvious indication of responsiveness or ROSC, a pulse check while compressions are occurring should be undertaken. If the palpated pulse is asynchronous, one may consider pausing the LUCAS Device. If the pulse remains, reassess the patient. If the pulse disappears, one should immediately restart the LUCAS Device.

Disruption or Malfunction of Lucas Device

- If disruption or malfunction of the LUCAS device occurs, immediately revert to Manual CPR.

Device Management

Power Supply

- Battery Operation
 - When fully charged, the Lithium Polymer battery should allow 45 minutes of uninterrupted operation
 - An extra battery should be kept in the Lucas Device bag
 - The battery is automatically charged when the device is plugged into a wall outlet with AC adaptor.
- One may connect the LUCAS Device to wall power with AC adaptor in all operational modes.



**Power Supply
Cord Slot
(for charging
and AC
operation)**

Care of the LUCAS Device after use

- Remove the Suction cup and the Stabilization Strap (if used, remove the Patient Straps).
- Clean all surfaces and straps with a cloth and warm water with an appropriate cleaning agent
- Let the device and parts dry.
- Replace the used Battery with a fully-charged Battery.
- Remount (or replace) the Suction Cup and straps
- Repack the device into the carrying bag

5.20 BLOOD DRAW

Medical blood draws by EMS can be extremely beneficial to the patient. When an IV or saline lock is established, blood should be drawn for hospital use. This reduces 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.

Draw appropriate blood quantity to fill required blood tubes based on destination hospital requirements. This is typically 30cc per patient. Blood draws should be labeled, or delivered directly to receiving nurse in ED and labeled immediately. Name, DOB, date, and time should be documented to ensure the sample is properly identified.

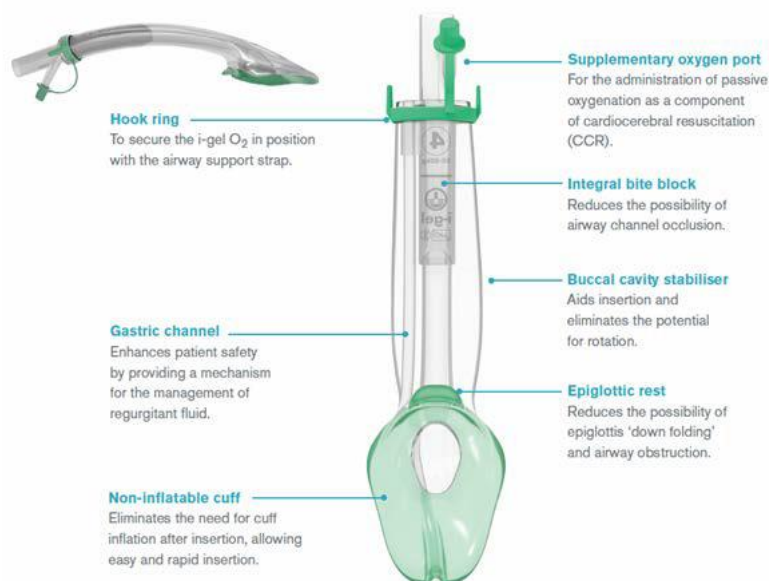
5.22 SUPRAGLOTTIC AIRWAYS

The current medical director approved Supraglottic Airways for adult and pediatric patients are the King Airway and the i-gel. 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

The new i-gel O₂



Colorimetric Capnometry



Either device should be sized based on manufacturer guidance for patients with no gag reflex in need of advanced airway. etCO₂ 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 etCO₂ unavailable.

This page updated 1/10/22

i-gel

1. Have another trained provider ventilate the patient. Determine appropriate size i-gel.
2. Open packaging and gently lubricate device.
3. Open patient's mouth and insert device until it seats in position. If difficulty consider smaller size i-gel.
4. 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 larger size i-gel and re-attempt if inadequate BVM ventilations.
5. Secure with enclosed strap.
6. If equipped with suction port, place soft suction catheter to reduce aspiration risk.

King

1. Have another trained provider ventilate the patient. Determine appropriate size King.
2. Open packaging, inflate pilot balloon and leak check with manufacturer recommended volume of air. Gently lubricate device.
3. Open patient's mouth and insert device until proximal portion of tube adaptor is at teeth or gumline. If difficulty consider smaller size King.
4. Inflate to manufacturer's recommended volume of air and gently withdraw device.
5. 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.
6. Secure device with commercial tube holder.
7. If equipped with suction port, place soft suction catheter to reduce aspiration risk.

This page updated 1/10/22

5.24 GLASGOW COMA SCALE

The Glasgow Coma Scale provides a score in the range 3-15; patients with scores of 3-8 are usually said to be in a coma. 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

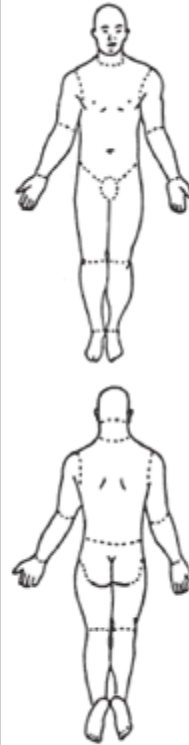
For children under 5, the verbal response criteria are adjusted as follow

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

5.26 BURN ESTIMATION

Area	Birth to	1 to 4	5 to 9	10 to 14	15	Adult	2nd*	3rd*	TBSA
	1 year	years	years	years	years				
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.

5.28 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					

5.30 EYE IRRIGATION

Purpose:

Immediate irrigate on of the eye to remove toxic materials or particles

Equipment:

1000ml NS, IV tubing

Pt. Position:

Preferably supine

Technique:

- Close clamp on tubing, spike bag of irrigating solution (NS).
- Select/Set tubing to 10gtts/ml setting.
- Flush IV Line.
- Place towels, blankets, or catch basin next to patient's head for run-off.
- Gently retract both upper and lower eyelids with fingers. (Retracting upper and lower eyelids separately is acceptable if this is all patient can tolerate)
- Hold tip of tubing over eye (avoid touching eye directly)
- Open clamp on tubing to begin flow of saline solution. Adjust flow as needed to obtain good flush.
- Instruct patient to alternate looking up, down, and from side to side during fluid flow.

***If the patient was pepper sprayed and commercially produced wipes are available, utilize these to wipe facial area.

5.32 TASER

If called upon to treat a person who has been subjected to the TASER, it is important to make sure that the subject 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. Refer to restraint guidelines if necessary. Police personnel may have already removed the probes and you are only needed for patient evaluation for possible secondary injuries. If removal is needed, follow the appropriate steps.

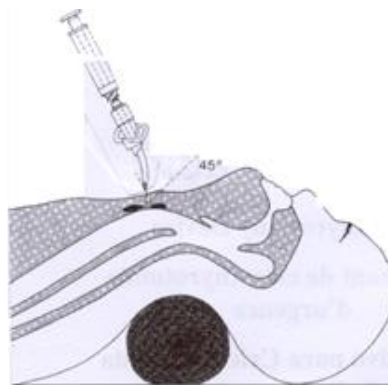
1. Gloves must be worn.
2. Place one finger near either side of the probe and stretch the skin taut. Beware of the probe hook as it is removed.
3. Using a brisk pull, remove the probe from the subject.
4. *** If there is significant resistance (deeply imbedded), or the probes are imbedded in soft tissue areas such as the neck, face, groin, or eyes and there is a question as to a safe removal, leave the probes in place, cut the wires.*
5. After removal, wipe the puncture site with an alcohol swab and apply adhesive bandage to the site.
6. 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.
7. If the probes have been removed pre-hospital 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 pointed out to the staff upon arrival.

5.34 EMERGENCY CRICOTHYROTOMY

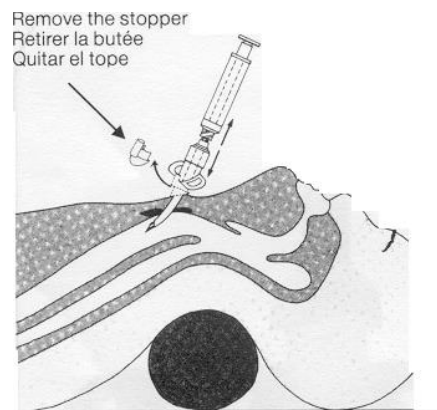
QuickTrach/QuickTrach II 4.0mm (adult) QuickTrach 2.0mm (pediatric)

- Purpose:** To establish definitive airway control in patients in whom such control cannot otherwise be established by other approved methods.
- Equipment:** QuickTrach or QuickTrach II Emergency Cricothyrotomy Device. 4.0mm(Adult)
2.0mm(Pediatric)
- Pt. Position:** Supine.
- Landmarks:** Superiorly-thyroid cartilage; Inferiorly-cricoid cartilage.
- Technique:** Follow Instructions listed as follows for the QuickTrach.
- Note:** Paramedics credentialed and trained by medical director for open surgical cricothyrotomy/pediatric needle cricothyrotomy may use that technique or QuickTrach. All Emergency cricothyrotomies will be reported to the medical director.

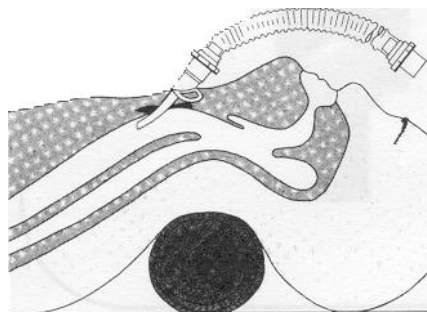
1. Open package and remove pre-assembled device.
 - a. If using QuickTrach II, remove cap from inflation port and deflate cuff with provided syringe.
2. Place the patient in a supine position. If no C-spine injury is suspected, hyperextend the neck and stabilize with a pillow under the patient's shoulders.
3. Secure the larynx laterally between the thumb and forefinger
4. Landmark the cricothyroid membrane (between thyroid cartilage, superiorly and the cricoid cartilage, inferiorly.)
5. Firmly hold the device and puncture the membrane with the tip of the device at a 90 degree angle.



6. After puncturing the membrane, check the entry of the needle into the trachea by aspirating air through the syringe. (If air is present the device is within the trachea)
7. Should no aspiration of air be possible in step 6 because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle further until entrance into the trachea is made. Once placement is verified, continue with step 10.
8. Change the angle of the needle insertion to 60 degrees and advance the device forward into the trachea to the level of the attached stopper.
9. Remove the stopper (Be careful not to advance the device further with the needle still attached.)



10. Hold the needle and syringe firmly and slide the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe.
11. If utilizing the QuickTrach II, inflate the cuff with 10ml of air with provided syringe.
12. Secure the cannula with the neck tape.
13. Attach connecting tube to the 15mm connection and the other end to a BVM and ventilate.



5.36 PERICARDIOCENTESIS

Purpose: To treat life threatening pericardial tamponade. Medical director must be notified of all pericardiocentesis procedures.

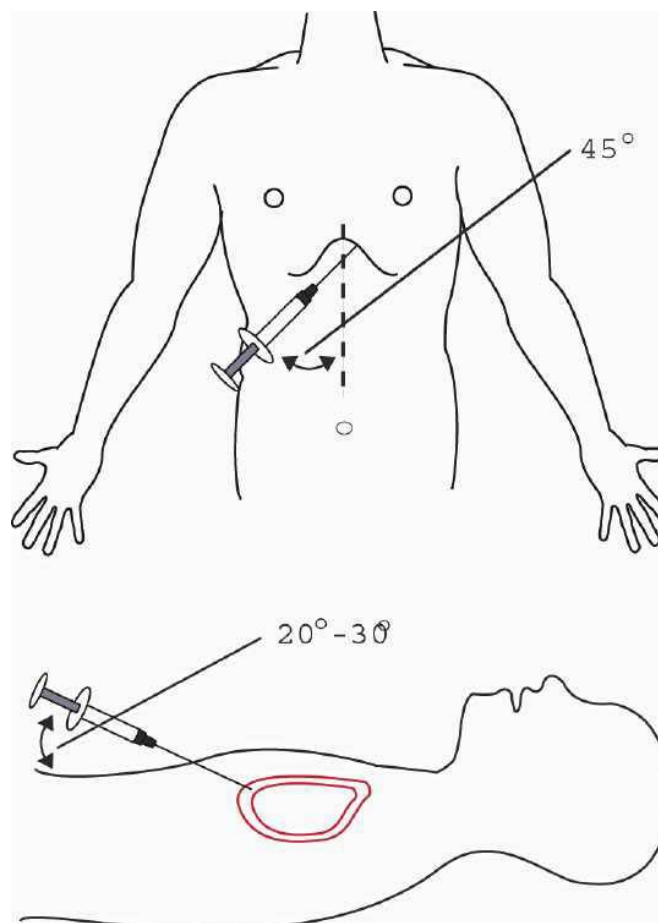
Equipment: 18 gauge spinal needle, 20ml syringe.

Pt. Position: Supine.

Landmarks: Insertion site is just below and patient left of the xiphoid process.

Technique: Find land mark, 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.



5.38 CHEST DECOMPRESSION

Purpose:	Convert tension pneumothorax to an open pneumothorax.
Equipment:	ARS (Air Release System 3.5 inch) needle or 10 or 14 gauge 3.5" angiocath. Pediatrics use 18 gauge 1.88" angiocath.
Pt. Position:	Supine
Landmarks:	4 th /5 th intercostal space, anterior axillary line
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 stylette. Remove stylette, but leave catheter in place after relief.
Other:	If tension re-occurs, repeat procedure.

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5.40 VENTILATORS

Ventilators may only be used by Paramedic level and Tier I-III services with specific training and medical director approval. Approved Paramedic level services may only use FiO₂, rate, and volume adjustments in assist control(AC) mode.

The mnemonic **DOPES** can help you remember the most common causes of post-intubation hypoxia or deterioration.

- Displacement
- Obstruction
- Pneumothorax
- Equipment failure
- Stacked breaths

5.42 EPINEPHRINE PUSH DOSE AND DRIP

Epinephrine has alpha and beta effects so it is an inopressor.

Do not give cardiac arrest doses (1mg) to patients with a pulse.

Do not utilize as first line treatment for shock, initiate only after appropriate other resuscitation measures.

Refer to Broselow or pediatric reference for pediatric blood pressure ranges.

BP must be monitored frequently, no less than every 5 minutes.

- Assemble a 1mg/10ml epinephrine syringe and place a double female luer lock adaptor on end
- Use an empty 20 mL syringe to draw up 2ml of the 1mg/10ml epinephrine
- With same 20ml syringe, draw up 18ml of normal saline to dilute the epinephrine
- The concentration of epinephrine in the 20mL saline flush syringe is now 10 mcg/mL
- Label the syringe to avoid medication errors
- Administer as necessary to maintain blood pressure

Onset: 1 minute

Duration: 5-10 minutes

Goal: Maintain mean arterial pressure(MAP)>65

Dose:

Mild hypotension SBP<80

1-2ml (10-20mcg or .01-.02mg) every 2-5 minutes

Moderate hypotension SBP<70

3-5ml (30-50mcg or .03-.05mg) every 2-5 minutes

Severe hypotension(cardiovascular collapse)

6-10ml (100mcg or .06-0.1mg) per minute

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In situations where a continuous infusion is needed, an epinephrine drip may be utilized.

- Draw up 1mg of either 1mg/1ml or 1mg/10ml epinephrine
- Inject into a 1 liter bag of Normal Saline
- The concentration of epinephrine in the 1 liter 1mcg/mL
- Label the bag to avoid medication errors
- Use a 10gtt/ml macrodrip tubing set and piggyback into primary infusing fluid
- Administer as necessary to maintain blood pressure

Onset: Immediate

Duration: Continuous while infused

Goal: Maintain mean arterial pressure(MAP)>65

Dose:

Mild hypotension SBP<80

1mcg/min or .001mg/min = 1gtt every 5 seconds

Moderate hypotension SBP<70

20mcg/min or .02mg/min = 4 drops per second

Severe hypotension(cardiovascular collapse)

50mcg/min or .05mg/min = 8 drops per second

This page updated 1/10/22

SECTION 6 MERCY EMS TACTICAL EMS GUIDELINES

6.0 INTRODUCTION TO TEMS GUIDELINES:

Only those individuals 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.

6.2 TEMS APPROVED MEDICATIONS

Adenosine 6mg pre-load syringe
 Adenosine 12mg pre-load syringe
 Albuterol solution for nebulizer
 Amiodarone 150 mg vials
 Aspirin 81mg chewable tablets
 Atropine 1mg pre-load syringe
 Atrovent solution for nebulizer
 Benadryl 50mg pre-load syringe
 Dextrose 50% pre-load syringe
 Epinephrine 1:1000 1mg ampule
 Epinephrine 1mg/10ml 1mg pre-load syringe
 Glucose for oral use
 Ketamine 500 mg vial
 Lidocaine 100mg pre-load syringe
 Magnesium Sulfate 5 grams Pre-load syringe
 Dilaudid/Hydromorphone 2mg pre-load syringe
 Narcan 2mg pre-load syringe
 Nitroglycerine spray 0.4mg per dose
 Norcuron 10mg vial
 Ondansetron 4mg pre-load syringe and Ondansetron ODT
 Tetracaine 1 bottle
 TXA 1 G unit vial
 Solumedrol 125mg vial
 Succinylcholine 100mg vial
 Versed 5mg vial

TEMS Approved OTC Medications (to be used in accordance with manufacturer instructions):

Ibuprofen 200mg tablets
 Kaopectate
 Loratadine 10mg tablets
 Sudafed tablets
 Acetaminophine 500mg tablets
 Pepto Bismol
 Imodium
 Pepcid

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6.4 AIRWAY MANAGEMENT:

TEMS Paramedics will require expert airway skills and validation of these skills by the medical director. Oxygen will be provided per standard 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 Supraglottics 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 colormetric indicator may be used to immediately confirm tube placement in the hot zone if an ET_{CO}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 non-visualized 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/5th 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.

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6.6 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.

For deep contaminated wounds or open fractures where time to definitive care is expected to be over 60 minutes, administer Ancef, 1 gram IVPB over 30 minutes. Verify patient is not allergic prior to administering.

For adult patient that is hypotensive(SBP<90) or tachycardica(HR>110) administer **TXA** 2 Grams IV/IO over 20 minutes. For unstable pediatric patients administer **TXA** 30mg/kg(maximum 2 Grams). 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.

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6.8 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.

6.10 SPINAL IMMOBILIZATION

Unless operating in a hot zone, standard 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 standard 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.

6.12 CARE OF SWAT PERSONNEL

Sprains and sprains: Ibuprofen 600mg PO, Tylenol 1G PO, ice pack and elevate extremity. An ACE wrap may also be applied. Do not apply so tight that circulation is impaired.

Allergies: Loratadine (OTC) 10mg PO one dose.

Anaphylaxis: Epinephrine 1mg/1ml 0.5mg IM as per routine care. Benadryl 50mg PO/IM/IV/IO. SoluMedrol 125mg IV/IO/IM.

Fever: If over 101 degrees, advise SWAT Commander to remove from duty. For any level of fever, administer Acetaminophen, 1,000mg PO or Ibuprofen 600mg 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.

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6.14 WOUND CARE

Lacerations: If the wound is deep and pulls apart, it will likely require closure in the ED. At times, you may be hours from an ED. In this case, to stop bleeding and prevent infection, irrigate with copious high pressure clean water and dress as appropriate. Advise SWAT Commander and patient of need for definitive care. Tactical Trained and credentialed TEMS Paramedics may apply Dermabond, steristrips, or staple simple lacerations if unable to seek timely care in the ED and physician not available for field response. Any wound repaired in the field requires emergency department evaluation after the incident and personnel can be safely sent for evaluation.

*Clean the wound well and pat dry.

*Using gloved fingers or forceps, approximate wound edges, apply at least 3 layers.

*Wait 30 seconds between each application of the Dermabond.

*Do not use in hair, on mucosal surfaces, or on face.

Place a standard dressing once dry. Do not apply antibiotic ointment over Dermabond.

Again, check Tetanus Status.

6.16 TRIAGE

Standard 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 as would be standard practice. Contact medical control at Mercy Hospital any time you feel it is necessary and situation permits this communication.

6.18 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.

7.0 MERCY EMS CRITICAL CARE TRANSPORT TIER II & TIER III

7.0 INTRODUCTION

The following guideline recognizes there will be situations where potentially unstable patients will require transfer to another facility to obtain a higher level of care. It should be noted that the CRITICAL CARE TRANSPORT Guideline is a supplement to the MERCY EMS Guidelines and requires additional Critical Care training AND OPERATIONAL PLAN APPROVAL. If at any time an EMS provider has concerns or questions the sending facility and EMS Medical Direction should be notified prior to initiating transport.

7.2 CONTACTING MEDICAL CONTROL FOR CRITICAL CARE TRANSPORTS

Medical control must be contacted for all calls above the paramedic scope of practice prior to departing the transferring facility. Some patients may require medical control contact prior to assuming patient care due to the unstable nature of their condition.

7.4 TRANSFERRING PATIENTS WITH DRUGS AND DEVICES

During an interfacility transfer, crew members shall follow all Mercy EMS Interfacility Transport Guidelines. In addition, patients on any drugs and devices not covered within the Interfacility Transport Guidelines may only be transported by Critical Care credentialed and equipped crews.

At the discretion of medical control, the drug rates/doses may be altered or discontinued depending on the patient's clinical condition. Where indicated, care providers may titrate a drug up or down depending on parameter delineated in the specific guideline and individual licensure level.

The following precautions should be kept in mind by transferring providers:

1. All medications have potential to cause allergic reactions.
2. Some medications cause local irritation around the IV site. Several may even cause tissue necrosis if there is infiltration. If there is infiltration of any line, the IV should be immediately discontinued.
3. Many of the listed drugs are incompatible with other medications. Therefore, additional medications should be given through a separate IV line, or, if one is not established, the infusion should be stopped and the line flushed before administering a second medication. This should only be done under direct medical control guidance.
4. Most drips require infusion pumps and cardiac monitoring.
5. Medical Control should be contacted if there is any change in patient condition or if any medication needs to be emergently discontinued during transport.
6. If the need arises for emergency medications to be given, infusions may need to be discontinued and medical control contacted. Likewise if blood needs to be initiated, medical direction should be consulted.
7. If an unfamiliar device or medication is present, an RN from the referring facility may need to accompany the Critical Care crew. At no time should a provider transport a patient if they do not have reasonable knowledge or confidence dealing with the medications or devices affiliated with the patient.

7.6 REQUESTING ADDITIONAL PERSONNEL

The EMS provider must contact medical control for medical direction in all situations where they are not comfortable with the circumstance of the transfer. The transfer will not occur unless the EMS provider and medical control are confident the personnel and equipment are appropriate for transfer.

7.8 MONITORING DURING TRANSPORT

As a standard of practice all patients that are being transported between facilities at the paramedic level or higher will be placed on the cardiac monitor and pulse oximeter. An IBP/NIBP device or manual BP cuff will be utilized to obtain vital signs. Those individuals operating at this level will maintain current ACLS and PALS certification as well as have received additional training in service specific equipment.

At a minimum a beginning and ending rhythm strip will be obtained and kept with the patient's medical record. In addition, all rhythm changes will be documented. A copy of the documented rhythm strips will be left with the receiving facility.

7.10 VENTILATOR

This guideline deals with considerations for the use of BiPAP and mechanical ventilators during interhospital transports. Typically respiratory care settings will already have been established by physicians and administered by respiratory therapists. These settings should be maintained during the transport unless otherwise directed by medical control.

1. Ventilator and circuit must be set up according to manufacturer's recommendations
2. Always keep a bag-valve mask (BVM) resuscitator close by in case of ventilator failure
3. Ventilator patient lung sounds should be checked and tube placement verified via CO2 detector after movement of the patient.
4. Ventilator patient requires continuous pulse oximeter and waveform capnography.
5. Ventilator patient sedation/paralysis(when indicated) should be maintained during all phases of care.
6. If at any point the patient is not tolerating BiPAP or the ventilator, they may be transported while assisting ventilations using BVM.

7.12 IV INFUSION PUMP

Many of the patients transported between hospitals will be receiving medications that will require administration with the use of an infusion pump. Crews must know how to utilize any pump in use during transport.

1. The infusion pump will be set up and used per manufacturer's recommendations.
2. Medications will be administered as specified by the above medication guidelines or as directed by medical control.
3. Prior to initiating use the provider capable of administering a specific medication will verify pump settings and then will begin infusion.
4. In the case of infusion pump failure or when a patient is receiving lifesaving treatment, an infusion pump may be utilized from a transferring facility, but the provider must know how to properly use it.
5. The infusion pump will be utilized only by trained providers at the paramedic and critical care level.

7.14 INVASIVE LINE MONITORING (ARTERIAL, CENTRAL VENOUS, INTRACRANIAL)

For the purpose of interfacility transports all invasive line monitoring will be performed by a Critical Care Paramedic.

1. The invasive line cable will be set up and utilized per manufacturer's recommendations.
2. The critical care paramedic will zero the device after connecting to our equipment and prior to transport.
3. If at any point during transport the providers are unable to obtain an ART line pressure, manual blood pressures will be utilized.

7.16 CRITICAL CARE MEDICATIONS**Cardiac Drugs Antiarrhythmics**

Use: Treatment and cardioversion of Atrial Fibrillation or Atrial Flutter. Treatment and prophylaxis of refractory Ventricular Tachycardia.

Adverse Effects: Hypotension, QT prolongation, Torsades, Ventricular Tachycardia, AV Block

Dosing:**Flecainide (Tambocor)**

Infuse: 2mg/kg over 20 minutes

Ibutilide (Corvert)

Infuse: 1mg IV over 10 minutes

Magnesium Sulfate

Bolus: 1-2 grams over 5 minutes

Infusion: 6-12 grams over 24 hours

Propafenone (Rhythmol)

Bolus: 2mg/kg in 15-20 minutes; followed by

Infusion: 0.0067-0.0078 mg/kg/minute

Special Consideration:

Use infusion pump for drips

May not be compatible with heparin, lidocaine, amiodarone or bicarb

Frequent BP checks for hypotension

Increased risk for ventricular dysrhythmias if on certain antihistamines or anti-nausea meds.

Cardiac Drugs Beta-Blockers

Uses: Slow ventricular response in SVT, Atrial Fibrillation and Atrial Flutter, slow sinus node rate

Adverse Effects:

Hypotension, Bradycardia

Hypoglycemia (diabetics on medications); usual signs and symptoms are masked

Bronchospasm

Sinus node arrest

Dosing:**Atenolol (Tenormin)**

Infuse: 5mg over 5 minutes

May be repeated in 10 minutes

Esmolol (Brevibloc)

Bolus: 500 mcg/kg (0.5 mg/kg) over one minute

Infusion: 50mcg/kg/minute for 4 minutes

If inadequate response, repeat bolus and increase drip rate by 50 mcg/kg/minute up to 3 times

(Total dose of 2000 mcg bolus and infusion at 200 mcg/kg/minute)

Drug comes in a 100mg (10mg/ml) vial or 2500 mg ampule into 250 ml (10mg/ml) or 500 ml (5mg/ml) Ns or D5W

Labetalol (Normodyne)

Infusion: 2mg/minute (concentration 1mg/ml; 2ml/min) duration from 25 min. to 2.5 hours

Metoprolol (Lopressor)

Inject: 5 mg IV slow push

May repeat dose up to 3 times every 5 minutes for a total dose of 15 mg

Sotolol (Betapace)

Bolus: 1-1.5 mg/kg; followed by

Infusion: 0,008 mg/kg/minute= 8mcg/kg/min

Special Considerations:

Use infusion pump

Check BP frequently; monitor heart rate

Carefully monitor for hypotension, excessive bradycardia or new AV blocks

Patient with Diabetes may have symptoms of hypoglycemia masked; watch carefully for mental status changes

Contact medical control if develop adverse reaction.

Cardiac Drugs Blood Pressure Lowering Agents

Uses: Short term parenteral treatment when oral treatment is not feasible

Nitroprusside may be used in CHF to reduce both preload and afterload (reduces work of the heart)

Adverse Effects:

Hypotension, Bradycardia, dysrhythmias, palpitations, flushing, angina

Headache, restlessness, drowsiness, confusion or slurred speech

Dosing:**Hydralazine**

5-40 mg IV push over 1-2 minutes

Usually given as repeat bolus doses every 20-30 minutes

Rarely given as drip: 1-10 mg/hr

Nicardipene (Cardene)

Dilute to: 0.1 mg/ml

Infusion: Start at 50 ml/hr (5 mg/hr)

May increase rate by 2.5 mg/hr every 15 minutes until desired BP is reached for a

Maximum dose of 15 mg/hr

If hypotensive (BP<60) or tachycardic (HR>140), discontinue drip.

May resume when stable @3-5 mg/hr

Infusion site must be changed after 12 hours

Nitroprusside

Infusion: Continuous to maintain BP

Small boluses or slight increases in infusion rate may produce profound hypotension

Nesiritide (Natreacor)

2 mcg/kg IV push over 60 seconds

0.01 mcg/kg/min maintenance infusion

0.02

Caution in pregnant or lactating patients

Special Considerations:

Use infusion pump

Dedicated IV line- should not administer in same IV line as other meds

Use with caution in patients with liver failure, since it is metabolized in the liver.

May be contraindicated in severe Aortic Stenosis as may decrease preload.

Solution must be wrapped in foil to protect from light

Check BP and Heart Rate every 5 minutes

Cardiovascular Drugs Calcium Channel Blockers

Uses: Ventricular Rate Control in A-Fib, Atrial Flutter, MAT or SVT

Adverse Effects: May cause Atrial Flutter, AV Block, Bradycardia, Chest Pain, CHF, Ventricular Arrhythmias Nausea/vomiting, dyspnea or hypotension

Dosing:**Diltiazem (Cardizem)**

Bolus: 0.25 mg/kg over 2 minutes (20 mg average patient), if needed may repeat bolus in 15

Minutes at 0.35 mg/kg (25 mg in average patient) over 2-5 minutes.

Infusion: Dilute 125 mg(25ml) in 100 ml NS/D5W

Rate: 5-15 mg/hour titrated to hear rate

Nicardipene (Cardene)

Dilute to: 0.1 mg/ml

Infusion: Start at 50 ml/hr (5 mg/hr), may increase rate by 2.5 mg/hr every 15 minutes

Until desired BP is reached for a maximum dose of 15 mg/hr

Special Considerations:

Carefully monitor for hypotension/ excessive Bradycardia/ new AV block

PVC's can occur with conversion to NSR

Don't use in the presence of a Wide Complex Tachycardia

Nicardipene: If hypotensive or tachycardic, discontinue drip. May resume when stable at 3-5mg/hr. Infusion site must be changed after 12 hours. Use with caution in patients with liver failure, since it is metabolized in the liver. May be contraindicated in severe Aortic Stenosis as may decrease preload.

Cardiovascular Drugs Glycoprotein IIb/III Inhibitors

Use: Unstable Angina, Non Q-wave MI, Percutaneous Coronary Intervention

Adverse Effects: Bleeding (usually at cath sites), possible allergic reaction to ReoPro

Dosing:**Abciximab (ReoPro)**

Loading bolus: 0.25 mg/kg over 10-60 minutes

Maintenance infusion: 0.125 mcg/kg/min for 12 hours following PCI or 18-24 hours for unstable angina

Should be administered through a 0.2 or 0.22 micron filter

Drip rates will vary depending on concentration that was mixed. Verify drip rates/dosage calculations with the transferring facility staff prior to transport.

Tirofiban (Aggrastat)

Loading infusion: 0.4 mcg/kg/min for 30 minutes

Maintenance infusion: 0.1 mcg/kg/min

Rate will be halved for patients with renal insufficiency

Eptifibatide (Integrilin)

Loading bolus: 180 mcg/kg over 1-2 minutes

Maintenance infusion: 2 mcg/kg/min up to 72 hours

Special Considerations:

Use infusion pump

Should always be given WITH heparin; if bleeding occurs, need to turn off heparin as well as the GPIIb/IIIa drug

Eptifibatide dose will be decreased in patients with impaired renal function; settings to be determined by the patient's ordering physician

Heparin Drip**Uses:**

Prevents blood clotting, especially in the following situation: AMI, PE, DVT

Adverse Effects:

Hemorrhage from various sites including needle sticks, GI tract, CNS bleeds

Dosing:

Bolus: 15-18 mg/kg

Infusion: 800-1600 mg/hour

Infusion rates may be outside this range and should not require adjustment during transport

Special Considerations:

Use infusion pump

Discontinue immediately for onset of major bleeding or acute mental status change

Contact medical control for any bleeding such as IV sites or gums

Cardiovascular Drugs Inotropes**Uses:**

Short term intravenous treatment of patients with acute decompensated heart failure

Severe CHF/Cardiogenic Shock

To increase cardiac output by increasing myocardial contractility and stroke volume

Hemodynamically significant hypotension not resulting from hypothermia

Adverse Effects:

May develop hypokalemia resulting from increased cardiac output and/or diuresis

May have tachycardia, ventricular dysrhythmias or ectopy, hypertension, angina or ischemic chest pain

Dobutamine may also cause hypotension

Dopamine may cause nervousness, headache, palpitations, dyspnea, nausea or vomiting

Dosing:**Inamirone (Inacor)**

Loading dose over 2-3 minutes: 0.75 mcg/kg

Maintenance infusion: 5-10 mcg/kg/min

Milrinone (Primacor)

Milrinone Loading dose over 10 minutes: 50 mcg/kg

Maintenance infusion: Max 0.75mcg/kg/min

Dobutamine:

2.5-20 mcg/kg/min continuous infusion

Onset may be 10 minutes

Dopamine:

1-20 mcg/kg/min continuous infusion

Onset may be 10 minutes

Epinephrine:

1-10mcg /minute titrated to desired effect

Norepinephrine (Levophed):

0.5-1.0 mcg/min, titrated up to 30 mcg/min to desired hemodynamic effect

Special Considerations:

Use infusion pump

Monitor for cardiac dysrhythmias; these may be caused by hypokalemia, pre-existing arrhythmias, abnormal drug levels, catheter placement, etc.

Check blood pressure and heart rate frequently. Discontinue briefly if develop hypotension secondary to vasodilation.

Contact medical control for any adverse effects.

Cardiovascular Drugs

Nitroglycerine Drip

Uses:

Acute Coronary Syndrome, CHF, Hypertension, decreases preload, and to a lesser extent, afterload

Adverse Effects:

Excessive hypotension which can provoke angina, headache, restlessness, palpitations, tachycardia or dizziness

Dosing: Continuous infusion titrated to maintain therapeutic effect while avoiding hypotension. Usual range 10-2000 mcg/min. May be higher in treatment of pulmonary edema.

Special Consideration:

Use infusion pump

Monitor heart rhythm

Check BP and HR frequently (every 5 minutes)

D/C infusion if systolic BP is <60mmHG and contact medical control

Contact medical control or worsening or persisting adverse signs/symptoms or for persisting BP<90

Thrombolytic Therapy

Uses:

Dissolves clots in blood vessels. Generally used in the setting of AMI, CVA; occasionally PE

Adverse Effects:

Minor hemorrhages from IV site and gums

Major hemorrhage from GI and intracranial or spinal sites

Reperfusion dysrhythmias often occur about 30-60 minutes after starting infusion

Allergic reactions including anaphylaxis may occur with Streptokinase or APSAC

Dosing:**Streptokinase, APSAC or TPA:**

Dose to be determined by transferring physician (weight based), should not require titrating.

Tenecteplase (TNK):

Weight-based onetime dose, administered over 5 seconds

Retevase:

Given in 2 doses of 10mg each, 30 minutes apart

Given as a 2 minute IV push

Special Considerations:

Use infusion pump

Monitor heart rhythm

Check BP and HR frequently

Do not mix with other medications in the same line

D/C infusion immediately and call medical control if there is cardiac arrest, major hemorrhage, anaphylaxis or change in mental status

Sedation and Paralytic Agents Benzodiazepine Drips**Uses:**

Sedation for patients who are intubated (and often concurrently on a paralytic drip)
May be used to treat Status Epilepticus

Adverse Effects:

May be more prone to hypotension if used with an opioid drug
Can cause paradoxical agitation, hypertension or tachycardia

Dosing:**Lorazepam (Ativan):**

Loading dose: 0.5-4.0mg IV bolus; may be repeated in 10 minutes
Infusion: 0.02-0.1mg/kg/hr

Midazolam (Versed):

Loading dose: 0.01-0.1mg/kg IV bolus
Infusion 0.02-0.1mg/kg/hr

Sedation and Paralytic Agents Moderate Sedation Agents**Uses:**

Sedation for patients who are intubated (and often concurrently on a paralytic drip)
May also be used for refractory seizures or therapeutic coma

Adverse Effects:

May be more prone to hypotension if used with an opioid drug
Can cause paradoxical agitation, hypertension/hypotension or bradycardia/tachycardia

Dosing:**Propofol:**

Loading dose: 0.5-5.0mg/kg
Maintenance infusion: 2-10mg/kg/hr

Dexmedetomidine:

Loading dose: 0.2mcg/kg/min
Maintenance infusion: 0.2-1.2mcg/kg/min

Barbiturates:

Pentobarbital is most commonly used
Loading dose: 10mg/kg; infuse up to 25mg/min

Ketamine:

Loading dose: 1-4 mg/kg
Maintenance infusion: 0.01-0.05mg/kg/hr

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Sedation and Paralytic Agents Opioid Drugs/Drips

Uses:

Typically part of a sedation combination for patients who are intubated
Occasionally for pain control

Adverse Effects:

May cause hypotension, especially in volume depleted patients or those with right-sided heart failure

Dosing:

Morphine:

Loading Dose: 2mg increments given every 5-10 minutes until adequate pain control;
Typically max dose is 10 mg/may be higher in patients on chronic pain therapy
Infusion: 1-10mg/hr

Fentanyl:

Loading dose: 1-5mcg/kg/kg given IV push
Infusion: 1-5 mcg/kg/hr

Sedation and Paralytic Agents Paralytic Agents

Uses:

Total muscular paralysis when patient movement may

1. Compromise airway control (ex. causing unwanted extubation)
2. Exacerbate a real or potential illness or injury (ex. spinal cord injury from a spine fracture)
3. Endanger the patient, EMS care provider or others

Adverse Effects:

Bronchospasm, flushing, hypotension and tachycardia have been rarely reported

Dosing:

Pancuronium:

Loading dose: 10mg/kg
May repeat dose every 1-2 hours as needed

Vecuronium:

Initial dose 10 IV push
Repeat dose of 10mg IV push every 20-40 minutes as needed
Maintenance infusion may be an alternative: 0.01mg/kg/min

Rocuronium:

Loading dose 0.6mg/kg
May rebolus 0.2mg/kg every 30-45 minutes
Maintenance infusion may be an alternative: 0.01-0.15mg/kg/min

Special Considerations:

Produces COMPLETE APNEA; therefore an intact airway (ET tube) and adequate ventilation/oxygenation MUST BE ESTABLISHED PRIOR TO ADMINISTRATION. Likewise, personnel and equipment with the ability to restore an airway, ventilation and oxygenation must be available during transport.

Causes paralysis only; therefore concomitant use of a sedative/hypnotic is indicated

Note: Paralysis may alter the clinical exam. For example, motor seizure activity will not be seen, but the brain will continue to undergo seizure activity, and this must be treated! Also, conditions such as shock, hypoxia, pain, intracranial injury, hypoglycemia, etc. maybe the cause of this unwanted, spontaneous patient movement in the first place. These conditions must be addressed but may be masked by the paralytic agent!

CNS Drugs Anticonvulsants

Uses:

Prevention and treatment of seizures

Adverse Effects:

If intravenous phenytoin is given too rapidly, may result in:

1. Cardiac dysrhythmias including v-fib or asystole
2. Hypotension

Subcutaneous extravasation of intravenous phenytoin may cause tissue necrosis or pain at the IV site

Dosing:

Phenytoin:

100mg-1200mg IV piggyback in normal saline; not to exceed 50 mg/minute

Fosphenytoin:

Dose expressed in phenytoin equivalents (PE)

15-20 PE/kg; up to 100-150 PE/minute

Valproic Acid:

40-60 mg/kg; up to 3mg/kg/min

Special Considerations:

Use Infusion pump

Monitor heart rhythm

Check BP frequently; vital sign monitor recommended

D/C infusion and contact medical control for any adverse effects

CNS Drugs Mannitol

Uses:

Treatment of increased intracranial pressure or selected fluid overload states

Adverse Effects:

Hypernatremia

Volume Depletion

Dosing:

25-50 grams IV push or bolus infusion (in 50cc D5W over 20 minutes)

CNS Drugs Steroids

Uses:

Spinal cord injury to decrease edema

Cerebral edema due to injury or CNS mass or lesion

Adverse Effects:

GI Bleed

Electrolyte disturbance and hyperglycemia

Hypertension or Acute CHF

Agitation

Corticosteroid hormonal suppression (hypoglycemia, hypotension, hypothermia)

Higher risk for infection or masking symptoms of infection

Dosing:

Methylprednisolone (Solumedrol):

Initial bolus: 30 mg/kg over 15 minutes

Infusion: start 45 minutes later; 5.4 mg/kg/hour over 2 hours

Special Considerations:

Contact medical control for question of adverse effects

Hyperalimentation/TPN, Insulin and Electrolytes

Hyperalimentation/TPN

Uses:

Intravenous nutrition

Adverse Effects:

Catheter related sepsis

Air embolism if central venous IV tubing becomes disconnected

Subcutaneous extravasation of solution can cause tissue necrosis

Discontinuation of infusion may cause hypoglycemia

Dosing:

Continuous infusion usually through central venous catheter but occasionally through a peripheral IV line. Rate should not require adjustment.

Special Considerations:

Use infusion pump

Do not administer any other medication through the same IV line

Contact medical control for any adverse effects listed above

Insulin

Uses:

Lowers blood glucose

Used in diabetics especially with ketoacidosis or hyperosmolar nonketotic coma

Adverse Effects:

Hypoglycemia related (tachycardia, diaphoresis, mental status changes and seizures)

Dosing:

5-15 units per hour but dosages outside this range may be used

Special Considerations:

Use infusion pump

Do not administer medications in the same IV line except D10

If symptoms of hypoglycemia develop:

1. Turn off infusion
2. Obtain blood sugar (finger stick)
3. Administer 25 grams dextrose if glucose <70
4. Contact medical control

Potassium Chloride

Uses:

Replacement therapy for hypokalemia

Adverse Effects:

Cardiac dysrhythmias (prolonged PR interval; wide QRS complex; depressed ST segment; tall, peaked T-waves; heart block; cardiac arrest)

Subcutaneous extravasation of solution can cause tissue necrosis

Dosing:

Usual range is up to 20mEq/hr., continuous infusion. May be mixed with various IV solutions in various sized bags including "piggy back" solutions. Rate should not require adjustment enroute.

Special Considerations:

Monitor heart rhythm

Often causes burning during infusion; contact medical control if this is problematic

Contact medical control for changes in EKG configuration and/or dysrhythmias

Obstetric Drugs Magnesium Sulfate

Uses:

Treatment of pre-eclampsia and eclamptic seizures
Premature rupture of membranes

Adverse Effects:

Lethargy, nausea, vomiting, hypotonia, respiratory depression, dysrhythmia

Dosing:

Loading dose: 2-6 grams IV over 15 minutes
Followed by: 5 grams IM in each buttock or infusion of 1-2 grams/hour

Special Considerations:

Monitor reflexes for symptomatic toxicity: 10mls of 10% Calcium Chloride and contact medical control
In renal failure, patient may require emergency dialysis

Obstetric Drugs Oxytocin (Pitocin)

Uses:

Stimulates post-partum contraction of the uterus to control bleeding

Adverse Effects:

Hypertension, tachycardia, dysrhythmias

Dosing:

10-40 units added to 1000ml IV fluid to control hemorrhage
Usual rate is 10-20 milliunits/minutes

Special Considerations:

Use infusion pump
Monitor heart rhythm
Check BP frequently; vital sign monitor recommended
Contact medical control for any adverse effects

Anti-infective Therapy Antibiotics and Antivirals

Uses:

Bacterial or Viral infections (treatment and prophylaxis)

Adverse Effects:

Allergic signs and symptoms, including anaphylaxis

Dosing:

Vary depending on the antibiotic
Generally given as a "piggyback" solution
Rate should not require adjustment en route

Special Consideration:

D/C infusion if there are any allergic signs or symptoms, then contact medical control
Most Commonly Used:

Acyclovir

Azithromycin (Zithromax)

Cefazolin (Ancef)

Ceftriaxone (Rocephin)

Gentamicin

Levofloxacin (Levaquin)

Metronidazole (Flagyl)

Peperacillin/Tazobactam (Zosyn)

Vancomycin

Anti-Infective Therapy Antifungals**Uses:**

Fungal infections

Often in immune-compromised patients, those on chemotherapy or chronic antibiotics

Adverse Effects:

Nausea or diarrhea

Amphotericin: fever, rigors, chills

Dosing:**Amphotericin B, Azoles or “Fungins”**

Usually given as a bolus dosing once daily to TID

May be given as continuous bladder irrigation: 50 mg/liter

Over 24 hours @ 42ml/hour

Special Considerations:

Drug interactions may occur with statins, Coumadin, antivirals, benzodiazepines, oral hypoglycemic drugs and transplant anti-rejection drugs. Side effects can be pre-treated with Acetaminophen or Diphenhydramine.

Pain Control Opioid Drips**Uses:**

Control of pain

Adverse Effects:

May cause hypotension, especially in volume depleted patients or those with right-sided heart failure

Respiratory depression

Dosing:**Morphine:**

Loading dose: 2 mg increments given every 5-10 minutes until adequate pain control; typically max dose is 10mg but may be titrated higher

Infusion: 1-10 mg/hour

Fentanyl:

Loading dose: 1-5mcg/kg given IV push

Infusion: 1-5mcg/kg/hour

Hydromorphone (Dilaudid):

Loading dose: 0.5-4.0 mg IV slow push

Continuous infusion: 1-10 mg/hour

Special Considerations:

Avoid Naloxone as this could precipitate acute withdrawal

Pump malfunction could precipitate withdrawal

Antihistamines (both H1 and H2) may counteract hypotension

Pain Control PCA (Patient Controlled Anesthesia) Pumps and Subcutaneous Pumps

Uses:

Treatment for patients with palliative care or chronic pain conditions
Often PO analgesia is not feasible

Adverse Effects:

Hypotension
Respiratory depression
Catheter site infection or irritation

Dosing:

PCA Pumps:

Morphine, Fentanyl and Dilaudid are most commonly used
Pre-programmed settings for patients
Patient may require assistance to "self-administer" medication

Subcutaneous Catheter Pumps:

Morphine is most commonly used
Up to 2mls volume at a time regardless of concentration
May also give IV fluids at a usual rate of 1-10 mls/hour (max 25 ml/hr)

Special Considerations:

Encourage patient to use medication as needed
Avoid Naloxone as this could precipitate acute withdrawal
Pump malfunction could precipitate withdrawal
Subcutaneous catheter sites need to be changed every 7 days

Antidotes

N-Acetylcysteine (NAC, Acetadote, Mucomyst)

Uses:

Acetaminophen overdose: toxic quantities

Adverse Effects:

Anaphylactic type reactions (urticarial, flushing, hypotension and bronchospasm)

Dosing:

Loading dose: 150 mg/kg over 15-20 minutes
Maintenance infusion: 50 mg/kg over 4 hours then 100 mg/kg over 16 hours

Special Considerations:

Ideal time of onset of treatment is within 8-10 hour of ingestion
Anaphylactic reactions may be treated with IV diphenhydramine
Maintenance infusion must be doubled at the 4 hour period

Cyanide Antidote Kit

Uses:

Cyanide poisoning

Adverse Effects:

May cause methemoglobinemia

Dosing:

Dosing as described in kit; weight based for children

Special Considerations:

Not to be use with Carbon Monoxide poisoning, consider Cyanokit

Thiamine**Uses:**

Wernicke 's encephalopathy

Adverse Effects:

Possible anaphylactic reactions

Special Considerations:

Glucose administration in nutritionally depleted patients should be accompanied by thiamine

Bicarbonate Drip**Uses:**

Tricyclic, aspirin or other acidotic overdoses

Renal protection after IV contrast or with severe muscle breakdown (rhabdomyolysis)

Adverse Effects:

Sodium load

Dosing:

Titrated to urine pH > 7 by hospital staff

Special Considerations:

Usually will have a Foley to check urine pH and output

May be associated with hypokalemia

Pyridoxine (Vitamin B6)**Uses:**

Isoniazide (INH) Overdose

Adverse Effects:

GI upset

Headache or sleepiness

Tingling or burning of hands/feet

Dosing:

5 grams IV over 3-5 minutes; repeat every 15-20 minutes until seizure resolve

Special Considerations:

Often patient is in status epilepticus; seizures may respond to benzodiazepines

Atropine/2-PAM**Uses:**

For SEVERE Cholinesterase Inhibitor poisoning (ex. pesticides, nerve agent)

Dosing:**Atropine:**

2-4 mg given every 5 minutes until signs of atropinization (this may take 25-50 mg)

2-PAM (2-pyridinealoxime)

One gram slow IV injection; if muscle weakness persists, give additional 500 mg after 30 minutes

Special Considerations:

2-PAM should be given WITH Atropine

GI Medications Antiemetic Agents**Uses:**

For control of severe nausea and vomiting

Adverse Reactions:

Drowsiness, dizziness, blurred vision, skin reactions, hypotension

Extrapyramidal symptoms (EPS); motor restlessness, dystonic reactions, pseudoparkinsonism,

Tardive dyskinesia with metoclopramide, prochlorperazine or promethazine

Headache or dizziness may occur with ondansetron

Dosing:**Metaclopramide (Reglan)**

10 mg IV over 2 minutes, may be repeated once in 10 minutes

Prochlorperazine (Compazine)

5mg IV over 2 minutes, may be repeated once in 10 minutes

Promethazine (Phenergan)

25mg IV over 2 minutes, may be repeated once in 10 minutes

Ondansetron (Zofran)

4mg slow IV over 2 minutes or IM, may be repeated in 15 minutes

GI Drugs Acid Reduction**Uses:**

Decrease secretion of gastric acid or chronic reflux

Patients with upper GI Bleed

Adverse Effects (Rare):

Occasional CNS symptoms, more so in the elderly

Jaundice

GI upset

Dosing:**Pantoprazole (Protonix):**

Bolus: 80mg over 5 minutes

Infusion: 8 mg/hour

Lansoprazole (Prevacid):

Bolus: 30-60mg over 30 minutes

Infusion: 6mg/hour

Ranitidine (Zantac):

Bolus: 50mg over 20-30 minutes

Infusion: 150mg over 24 hours

Special Considerations:

May be used for antihistamine affects

GI Drugs Bleed Related Medications

Uses:

Variceal Upper GI Bleed

Adverse Effects:

Gall Bladder sludging or stones

Diarrhea and GI upset

Hypoglycemia

Dosing:

Octreotide:

50mcg IV bolus, then 50mcg/hour

Special Considerations:

Alters the balance between insulin/glucagon; could result in either hypoglycemia or hyperglycemia