LOUISVILLE METRO EMS

Prehospital Treatment Protocols

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LOUISVILLE METRO EMERGENCY MEDICAL SERVICES

LOUISVILLE, KENTUCKY

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March 29, 2013

Since Louisville Metro EMS was created in 2005, our goal has been to build a service that is evidence-based and medically-focused. We've implemented many new treatments and technologies over the years that have pointed us in the right direction, and I'm pleased to present you with a document that represents another significant step forward – our new Louisville Metro EMS Medical Protocols.

As many of you know, these protocols have been a work in progress. It is often said there are no shortcuts to any place worth going, so I hope you'll agree that the results prove the journey was worthwhile. More importantly, we felt it was important to make some of these changes only when we had the necessary quality assurance tools, technology, and measures in place to guide and monitor their appropriate, effective and safe use.

Some of the changes and improvements to the protocols in this version include:

- Up-to-date cardiac arrest management, including passive ventilation, revised defibrillation energies, and requirements for on-scene treatment;
- Entirely new protocols, including those for excited delirium, the use of antidotes in a variety of overdoses, termination of resuscitative efforts, spinal clearance, and permissive hypotension in trauma;
- The introduction of new medications, such as etomidate, versed, diltiazem and ondansetron;
- New skills, tools and modes of medication delivery, including side-stream $etCO_2$, CPAP, bougie and drug-assisted intubation, cricothyrotomy, and medication administration by the intranasal route;
- Electronic hyperlinks between different sections of the protocol, including the skills sections, the pharmacopeia and other related protocols;
- A mobile phone app for ease of use; and
- Increased autonomy for providers, and decreased requirements for On-Line Medical Control.

This last point is an important one – while protocols are meant to give you basic guidelines to follow in rendering safe and effective patient care, they really aren't living, breathing documents. Rather, they're words on a page that may not apply consistently in each and every situation. That's why protocols don't treat patients; trained EMTs and paramedics do. A long time ago in the very early days of EMS, a Medical Director sent a letter to a respected colleague asking for a copy of his system's protocols. In return, he received a brief note that said something like, "We don't have protocols - we have training."

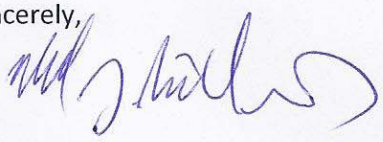
So this document is designed to provide you with guidelines and a foundation for training, not a cookbook or collection of recipes. It also asks you to use your skills and your best judgment. I hope you'll see these as an opportunity to further sharpen your focus and use your years of training and experience to provide our patients the very highest quality care.

I hope you'll also note that what has been taken out of our protocols is almost as important as what has been added. For example, we'll no longer be giving furosemide for CHF, or morphine for CHF, Acute Coronary Syndromes and chest pain. There are also some things we considered but very purposefully did not include, for instance induced hypothermia in cardiac arrest. The medical and scientific literature is still unclear about its benefits in the prehospital setting, and there's no real point in introducing a new modality like this one without our hospitals being able to consistently provide the same capability once our patients arrive in the ER. We are, though, working with our medical center partners on a dedicated resuscitation center model, along the lines of what we have already done for stroke, STEMI and level-1 trauma, where we would bring patients in cardiac arrest whether for cooling and/or to perform post-resuscitation cardiac catheterization.

In closing, I want to thank everyone who contributed their time and hard work to this project – but I especially want to thank several of our colleagues who worked tirelessly to bring this document to fruition: Majors Jenny Cravens, Chris Lokits, Chad Scott and paramedic Todd Coy. Thanks to their efforts, I think we have a new set of protocols in which we all can take pride. Their work – and yours – makes me especially proud to be a part of this service that we have built together.

Thank you.

Sincerely,



Neal J. Richmond, M.D., FACEP
Chief Executive Officer and Medical Director

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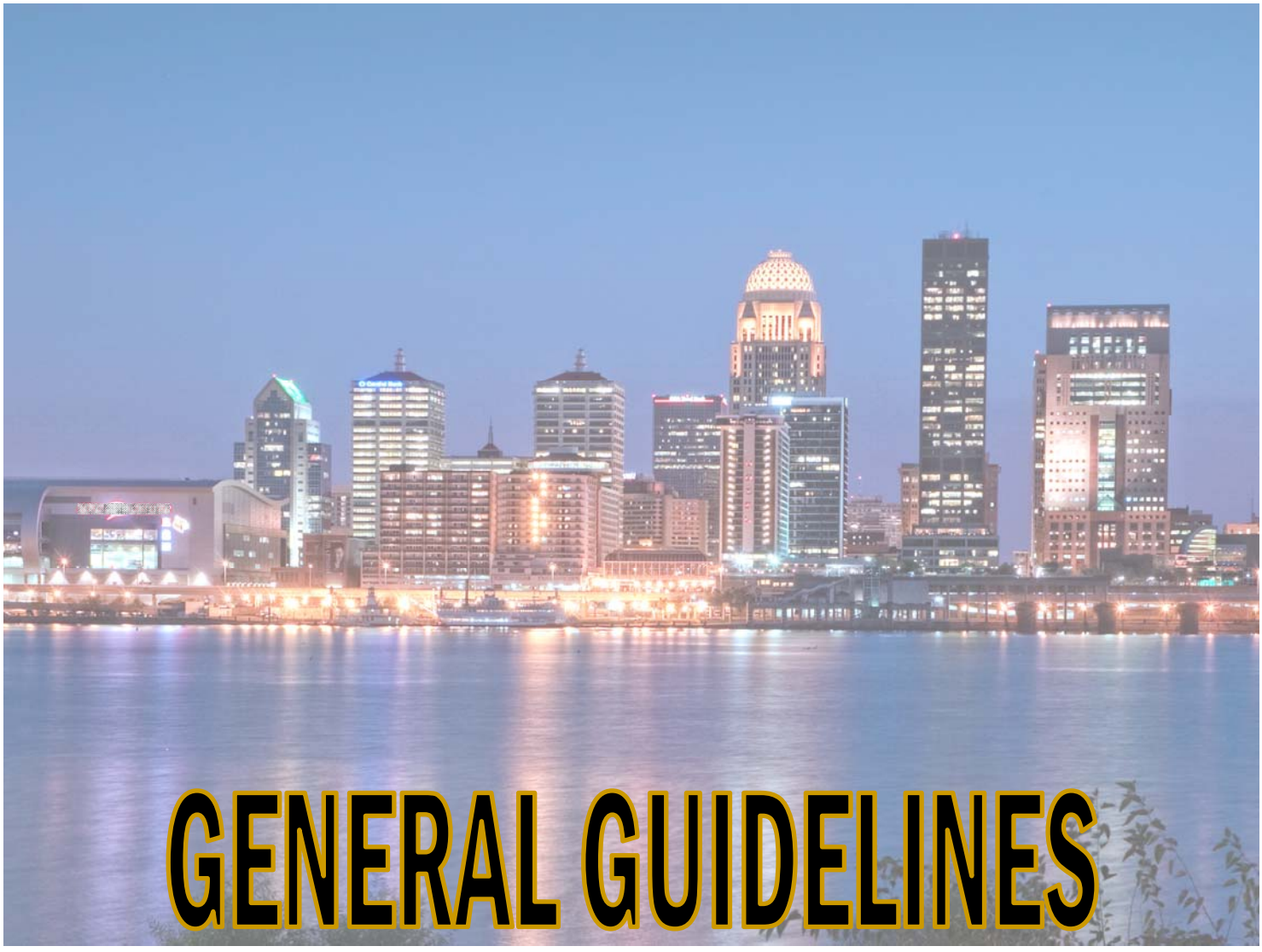
LOUISVILLE METRO EMS PROTOCOLS



GENERAL GUIDELINES

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DEATH ON SCENE

Withholding resuscitation efforts

The legal guidelines for withholding resuscitation efforts in Louisville Metro have been established by the Coroner, in consultation with the County Attorney. These situations for BLS personnel are:

1. No pulse - carotid or femoral, and;
2. No respirations, and;
3. No detectable blood pressure, and;
4. No pupillary reflex, and;

ASSOCIATED WITH:

- Obvious Mortal Wounds: These include decapitation, incineration, a severed body, and injuries that are so extensive CPR cannot be effectively performed (e.g., severe crush injuries to the head, neck and chest).
- Rigor Mortis; This is the stiffening of the body and its limbs that occurs after death, usually within 4 to 10 hours. The exception to this is a person who may be exposed to the cold.
- Obvious Decomposition of the Body; The body will be putrefied, decayed.
- Lividity /Venous Pooling; a red or purple skin discoloration that occurs when gravity causes the blood to sink to the lowest parts of the body and collect there. Lividity/Venous Pooling usually indicates that the patient has been dead for more than 15 minutes unless the patient is exposed to a cold environment.

If a person is dead at the scene, the responding unit shall convey this information to the LMEMS Communication Center. The area surrounding a corpse shall not be disturbed in any manner unless it is absolutely necessary to do so in order to treat another sick or injured person. When this is the case, the scene will be disturbed as little as possible. Any movements of the patient or items around the patient shall be documented thoroughly.

- The body will not be searched for identification.
- Personal effects of the corpse will not be searched or handled in any manner.
- **The EMS unit will remain on the scene until LMEMS ALS unit arrives to confirm EKG.**
- **EMS will notify LMPD and the Coroner's Office through LMEMS Dispatch.**

Determination of Death

Indications:

Except in cases where a person suffers from accidental hypothermia, cold water drowning, lightning or electrical injury, a Paramedic may make a determination of death if:

ALL of the following clinical conditions are present:

Unresponsiveness
Apnea
Absence of palpable carotid pulse.
Bilaterally fixed and dilated pupils.
Asystole in two (2) separate EKG leads, except in trauma cases or Kentucky EMS DNR is present.

AND

Any one of the following clinical conditions are present:

Lividity of any degree.
Rigor mortis of any degree.
Venous pooling.
Traumatic injury which is incompatible with life.
The presence of a properly completed Kentucky EMS **DO NOT RESUSCITATE** form for an adult.

- Prior to making the final determination of death, a Paramedic may contact the Medical Consultation point for guidance and assistance in making such determination of death.
- The Paramedic shall immediately cause the law enforcement agency of jurisdiction and the coroner to be notified of the death.
- The Paramedic shall take reasonable actions to protect the body and the scene.
- The Paramedic shall document his/her findings thoroughly.
- If the Paramedic has any questions, he/she may contact the Medical Control point.

DEATH ON SCENE

Termination of resuscitative efforts

Indications:

The termination of resuscitative efforts is intended to be an event in which the Paramedic has undertaken resuscitative efforts and these efforts have been unsuccessful, except in cases where a person suffers from accidental hypothermia, cold water drowning, lightning or electrical injury. Such events are usually based upon one or more of the following situations:

- Upon arrival at the scene, you find that CPR is being performed by a lay person or First Responder on a patient meeting the criteria of **"Determination of Death".**
- The patient is part of a multiple casualty incident.
- The incident scene is unsafe and the continuation of such efforts will imperil the rescuers' safety.
- A condition exists that will impair your ability to transport the patient to a hospital in a safe and timely manner.
- A Paramedic is presented with a properly completely Kentucky EMS **DO NOT RESUSCITATE** form for an adult after resuscitative efforts have been initiated at the ALS level.

OR

The following clinical conditions are present:

⇒ No adequate bystander CPR
⇒ Arrest not witnessed by EMS.
⇒ Adequate CPR as notated in Adult Non-Traumatic Cardiac Arrest without clinical improvement.
≥ 6 minutes of CPR
⇒ Airway is adequately managed with or without the use of advanced airways.
⇒ ≥ 3-analyzation periods with no shock advised or indicated
⇒ ≥ 1-dose of vasopressin and/or epinephrine
⇒ Asystole in two (2) separate EKG leads, except in cases of trauma or Kentucky DNR present
⇒ No ROSC at any point, even if brief and unsustained.

EtCO2 Considerations

AHA/ACLS suggest ROSC unlikely if:

- EtCO2 <10 mm Hg with
  - ⇒ Adequate CPR
  - ⇒ Properly managed Airway

- The Paramedic shall contact **OLPG** for consultation prior to the termination of efforts.
- The Paramedic shall immediately notify the appropriate law enforcement agency and the coroner's office.
- The Paramedic shall take reasonable actions to protect the body and the scene. Intravenous lines, endotracheal tubes, and other medical supplies SHALL NOT be removed from the patient.
- The Paramedic shall document his/her findings on the patient care report.

REFUSAL OF CARE

INDICATIONS:
For all patients who refuse emergency medical care and/or transport.

- The patient, patient's guardian, or the patient's health care surrogate must have decisional capacity that is not compromised by impairments.
  - ⇒ Decisional Capacity - an individual's ability to make an informed decision concerning the patient's medical condition and/or treatment.
  - ⇒ In order to demonstrate decisional capacity, the patient, patient's guardian, or the patient's health care surrogate must be alert and capable of understanding the following:
    - The nature of the medical problem and/or complaint;
    - The possible risks, complications and implications of refusing emergency medical care;
    - All treatment and transportation alternatives.
  - ⇒ A patient's decisional capacity may be compromised by certain impairments, including but not limited to the following:
    - Use and/or abuse of alcohol, illegal or prescription drugs, toxic substances.
    - Head trauma, dementia, encephalopathy and/or mental retardation.
    - Acute or chronic psychiatric illness
    - Medical illness, including but not limited to the following: hypoxia, hypotension, hyperglycemia, hypoglycemia, dehydration and sepsis.
- A patient, patient's guardian, or patient's health care surrogate, who demonstrates decisional capacity has the right to refuse emergency medical care and/or transport.
  - ⇒ Prior to accepting a refusal of medical care and/or transport, the LMEMS crew shall attempt to:
    - Perform a complete assessment on the patient;
    - Offer appropriate treatment and transport to the patient;
    - Attempt to speak with whomever called 911, as well as any family, friends, bystanders, patient surrogates or guardians and/or medical personnel on scene;
    - Determine the patient's, patient's guardian, or the patient's health care surrogate *Decisional Capacity* (defined in item above) to refuse emergency medical care and/or transport.
- For any patient who is refusing emergency medical care and/or transport, the following shall be completed in the Electronic Patient Care Report (ePCR):
  - A signed refusal of emergency medical care and/or transport;
  - Any discharge instructions provided to the patient;
  - The risks and consequences which were explained to the patient;
  - Documentation of the patient's decisional capacity and understanding of all of the above requirements.
- Contact must be made to a LMEMS Operations Officer and/or **OLPG** ☎, if appropriate, for any refusal of emergency medical care and/or transport if any of the following apply:
  - Any medication administration prior to or after EMS arrival (ex. NTG, Epi-Pen).
  - Any patient who has a high index of suspicion for serious risks, complications and/or implications.
  - Any time a surrogate wishes to refuse on behalf of a patient.
  - If a BLS provider is taking the refusal.
- When contacted for a refusal of emergency medical care and/or transport, the LMEMS Operations Officer shall attempt to assess the patient's decisional capacity.
  - ⇒ This will be accomplished by speaking to the medical crew on scene and/or any of the following who may be on scene or involved in the patient's medical care;
    - The patient;
    - The original 911 caller;
    - Family members;
    - Friends;
    - Bystanders;
    - Patient surrogate or guardian;
    - Other Medical personnel.

High Index of Suspicion:
A provider's concern that an individual may have an acute medical, traumatic, psychiatric or social condition that might result in an untoward patient outcome. Indications for a high index of suspicion may include, but not be limited to:

- The mechanism of injury to the patient;
- A 911 caller, friend, neighbor, co-worker, family member, home health aide expresses concern for the patient's health, with good cause;
- A caller to 911 is reporting expressed or actual suicidal or homicidal behavior by the patient, regardless of whether the caller is on the scene or not;
- The request for assistance originated with a physician or other health care provider.

TRAUMA CENTER INDICATIONS

Major trauma patients may need to be transported to a designated trauma center in a timely manner. It is the best interest of the patient to be transported to a designated trauma center if the patient meets certain criteria.

In general, in the presence of significant trauma, consider the following guidelines:

1) VITAL SIGNS AND LEVEL OF CONSCIOUSNESS

- Glasgow Coma Score <14
- Systolic BP <90mmHg (SBP)
- Respiratory rate <10 or >29
- Revised Trauma Score <11

Transport and notify Level 1 Trauma Center of your impending arrival

2) ASSESSMENT OF ANATOMY AND EXTENT OF INJURIES

- All gunshot wounds
- All penetrating trauma to:
  - Head
  - Neck
  - Torso
  - Thigh
  - Groin
  - Other Extremity injuries proximal to knee/elbow
- Flail chest
- Combination trauma with burns
- Two or more proximal long bone fractures
- Combination of 2˚ or 3˚ burns involving more than 10% BSA in the face, or the airway
- Open fracture of a long bone
- Extremity injury associated with absent distal pulse
- Unstable pelvis
- Open or depressed skull fracture

Pediatric Considerations:

- For patients ≥ 13 y/o with penetrating trauma: Transport to adult level 1 trauma center.
- For patients ≥ 15 y/o with blunt trauma: Transport to adult level 1 trauma center.
- All other pediatric trauma patients not meeting age considerations above should be transported to the most appropriate facility per the destination guidelines.

Transport and notify Level 1 Trauma Center of your impending arrival

3) MECHANISM OF INJURY FACTORS

- Falls over 20 feet
- Ejection from the vehicle
- Death of an occupant in the same vehicle
- Extrication Time >20 minutes with associated symptom/signs for significant trauma
- High speed auto crash indicators:
  - Initial speed >40mph;
  - Major auto deformity >20 inches;
  - Intrusion into passenger compartment >12 inches.
- Auto-Pedestrian or Auto-Bicycle injury with significant (>5mph) impact
  - Victim thrown or runover
- Motorcycle Crash >20mph or separation of rider from motorcycle

Transport to Level 1 Trauma Center and Notify if appropriate

4) PERTINENT HISTORY FACTOR

- Age <5 or >55
- Cardiac or Respiratory Disease
- Insulin dependent diabetes, cirrhosis, or morbid obesity
- Pregnancy
- Immunosuppressed patients
- Patient with bleeding disorder or patient on anti-coagulants

Consider Transport to level 1 trauma center if appropriate

LOUISVILLE METRO EMS PROTOCOLS

ADULT CARDIAC

BACK NEXT

ADULT NON-TRAUMATIC CARDIAC ARREST

GENERAL TREATMENT:

Begin CPR:

- See CPR Pit Crew Procedure★
- Maintain continuous compressions at a consistent rate >100/minute:
  Push straight down at least 2-inches with each compression and allow the chest to recoil completely;
  Avoid any interruption in compressions, except during AED analysis;
  Continue compressions even while AED is charging;
- Unless extreme conditions are present that do not allow for appropriate resuscitative efforts, do not move patient to ambulance until it is time to initiate transport.
- Rapidly apply ITD to BVM if there are a sufficient number of providers to maintain an effective 2-handed face-mask seal.

Call for ALS and Fire assistance (if not already dispatched).

★ If there are initially ≤ 2-providers on-scene, **do not interrupt chest compressions** with BVM-ventilations or use of supraglottic airway.

★ Administer passive oxygenation **only** by non-rebreather mask @ 15L/min. with NPA or OPA, until ≥ approximately 2-minutes of CPR and 3-AED analysis/shocks have been delivered.

BVM Ventilations / Airway Considerations:

- If enough personnel are present to provide BVM assistance do not hyperventilate. Use only enough volume to provide adequate chest rise.
- Use asynchronous ventilations every 5-6 seconds (or 10-12/minute);
- Perform continuous compressions at ≥ 100/minute.

BASIC TREATMENT

Apply AED:

If arrest was witnessed by EMS or Fire
Immediately apply AED, follow prompts, analyze, and shock as indicated:
- Following each analysis (shock or no shock), perform approximately 2-minutes of CPR.

If arrest was not witnessed by EMS or Fire
Perform approximately 2-minutes of CPR before analyzing:
- Following each analysis (shock or no shock), perform approximately 2-minutes of CPR.

Following each analysis/2 minutes of CPR cycle:

- If signs of ROSC, continue to ventilate and initiate transport.
- If no ROSC, perform analysis/shock/CPR as indicated.

After ≥ 6 minutes of CPR have been completed:

- Consider supraglottic airway;
- AED may be switched to cardiac monitor/defibrillator, if ALS is on-scene;
- Initiate transport if ALS not on-scene:
  Continue CPR without interruption;
- If transport is delayed, continue CPR and AED analysis.

WHEN NOT TO BEGIN RESUSCITATION

See Death Determination / Withholding Resuscitation Efforts

ADVANCED TREATMENT:

Begin or continue CPR as per adult Basic Life Support protocol:

- Initiate continuous EtCO2-monitoring and attempt to improve quality of CPR if EtCO2 < 10mm Hg.

Initiate cardiac monitoring and rhythm analysis:

- **If AED already in place** switch to cardiac monitor-defibrillator only after 6 minutes of CPR with AED have been completed.
- **If AED is not in place** apply cardiac-monitor/defibrillator as follows:
  If arrest was not witnessed by EMS or Fire, perform approximately 2-minutes of CPR first.
  If arrest was witnessed by EMS or Fire, continue CPR but immediately apply cardiac-monitor defibrillator.

NEXT

Ventricular fibrillation
Pulseless ventricular tachycardia

- Defibrillate at 360 joules biphasic;
- Perform approximately 2-minutes of CPR;
- If there is no change in the rhythm defibrillate at 360 joules biphasic;
- Perform 5-cycles (or approximately 2-minutes) of CPR.
- If there continues to be **no change in the rhythm**:
  Continue to defibrillate at 360 joules following each 2 minutes of CPR.
- Perform advanced airway management with endotracheal tube (1-attempt) or supraglottic device:
  Verify placement;
  Apply ITD.

Intubation should be deferred until 6 minutes of CPR with or without 3-defibrillatory shocks have been completed, as long BVM ventilations are being successfully applied.

- Establish IV/IO access with 0.9% sodium chloride (NS);
- Administer vasopressin-40u IV/IO, one dose only;
- If no change in rhythm or ROSC, administer epinephrine-1mg (10 cc of 1:10,000) IV/IO;
  May repeat every 3-5 minutes.
- Administer amiodarone-300mg IV/IO;
  May repeat once at 150mg after 3-5 minutes.

Special Considerations

- **Only if suspected hyperkalemia or calcium channel blocker overdose:**
  Consider calcium chloride-1gm IV/IO, slow push with saline flush.
- **Only if suspected prolonged acidosis, hyperkalemia or tricyclic antidepressant overdose:**
  Consider 8.4% sodium bicarbonate 1mEq/kg, IV/IO;
  May repeat 0.5mEq/kg every 10-minutes as needed, contact **OLPG** for consultation.☎
- **Only if suspected torsades de pointes:**
  Consider magnesium sulfate-2gm IV/IO, slow push over 2-minutes.

- If there is no response to treatment consider termination of efforts per the termination of resuscitative efforts protocols.

Transport should be initiated only:

- If ROSC or
- If no ROSC and the following has been performed:
  ≥ 6 minutes of CPR
  ≥ 3-analysis periods/defibrillations
  ≥ 1-dose each of vasopressin and amiodarone

Asystole or PEA

- Perform approximately 2-minutes of CPR;
- If no change to shockable rhythm or ROSC after each cycle, continue CPR, and immediately treat reversible causes;
- Perform advanced airway management with endotracheal tube (1-attempt) or supraglottic device;
  Verify placement;
  Apply ITD.

Intubation should be deferred until 6 minutes of CPR with or without 3-defibrillatory shocks have been completed, as long BVM ventilations are being successfully applied.

- Establish IV/IO access with 0.9% sodium chloride (NS);
- Administer vasopressin-40u IV/IO, one dose only;
- If there is no change to a shockable rhythm or ROSC, administer epinephrine-1mg (10cc of 1:10,000) IV/IO.
  May repeat every 3-5 minutes.

Special Considerations

- **Only if suspected hypovolemia:**
  Administer 500cc fluid bolus; otherwise run @ KVO rate.
- **Only if suspected tension pneumothorax:**
  Follow procedure for needle thoracentesis.
- **Only if suspected cardiac tamponade:**
  Initiate rapid transport.
- **Only if suspected hypoglycemia:**
  Administer dextrose-25gm (50cc of D50%).
- **Only if suspected opiate overdose:**
  Consider naloxone-2mg IV/IO.
  May repeat every 5-minutes to a maximum dose of 10mg.
- **Only if suspected hyperkalemia or calcium channel blocker overdose:**
  Consider calcium chloride-1gm IV/IO slow push.
- **Only if suspected prolonged acidosis, hyperkalemia or tricyclic antidepressant overdose:**
  Consider 8.4% sodium bicarbonate 1mEq/kg IV/IO.
  May repeat 0.5mEq/kg. every 10-minutes as needed, contact **OLPG** for consultation.☎
- **Only if suspected beta-blocker overdose:**
  Consider glucagon-1mg IV/IO, slow push over 1 minute.
  May repeat at 2mg IV/IO slow push over 1-minute x2.

- If there is no response to treatment consider termination of efforts per the termination of resuscitative efforts protocols.

Transport should be initiated only:

- If ROSC or
- If no ROSC and the following has been performed:
  ≥ 6 minutes of CPR
  Potential reversible causes have been initially addressed

Quality Control Points

Non-Traumatic Cardiac Arrests | Antidotes | Hyperkalemia | Needle Thoracentesis

BRADYDYSRHYTHMIAS

INDICATIONS:

- Heart rate < 60 or relative bradycardia;
- Symptoms/signs directly attributable to bradycardia generally do not occur unless the rate is < 50/minute.

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥95% and work of breathing.
- Assess for hemodynamic instability:
  Hypotension, or relative hypotension with signs of poor perfusion.
  ACS/Acute MI
  Acute pulmonary edema
- Follow protocols for associated symptoms/signs, as appropriate:
  If chest pain or anginal-equivalent symptoms are present, follow protocol for Ischemic chest pain/ACS/STEMI.
  If hypotension is present, follow protocol for shock.
- Call for Advanced Life Support (if not already dispatched), but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate cardiac monitoring and obtain 12-lead EKG:
  Evaluate rhythm for width, regularity and rate.
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Consider 250-500cc IV/IO fluid bolus for hypotension.
- Do not delay pacing (for IV placement or drug administration) in the presence of:
  Severe hemodynamic instability
  Acute MI
  High-degree AV-block (Mobitz type-II second-degree or 3rd-degree instability)

If unstable:

- Begin external pacing at 80 bpm with minimal output, and increase milliamps until capture has been achieved;
- If time permits and if adequate respirations, consider sedation prior to or during pacing:
  Administer midazolam-2mg IV/IO or 2 - 10mg IN titrate to effect (max cumulative IN dose 10mg)
  Or only if midazolam is not available, administer lorazepam-1mg IV/IO;
  Continuous EtCO2 monitoring should be applied prior to sedation
- If no hemodynamic response increase the paced rate to 100/minutes using 10bpm increments;
- While preparing for pacing, administer atropine sulfate 0.5mg IV/IO, and repeat every 3-5 minutes as needed for a total dose of 0.04mg/kg (3mg max).

If patients presents with cardiogenic shock, follow shock/ hypotension protocol for dopamine administration. (see chart)

If no response consider:

- **For continued hypoperfusion:**
  Begin epinephrine infusion - mix 1mg in 1L 0.9% sodium chloride (NS)
  Infuse at 2-10mcg/minute titrate to patient response. (see chart)
- **For suspected hyperkalemia** (wide complex rhythm, 12-lead EKG findings, dialysis history):
  calcium chloride-1gm IV slow push
  8.4% sodium bicarbonate-1mEq/kg
  May repeat 0.5mEq/kg every 10-minutes if needed, contact **OLPG** for consultation.☎
- **For suspected prolonged/severe acidosis:**
  8.4% sodium bicarbonate-1mEq/kg
  May repeat 0.5mEq/kg every 10-minutes if needed, contact **OLPG** for consultation. ☎
  For suspected beta-blocker overdose:
  glucagon-1mg IV/IO slow push over 1 minute;
  May repeat at 2mg IV/IO slow push over 1-minute x2.
- **For suspected calcium channel-blocker overdose:**
  calcium chloride-1gm IV slow push.

If stable:

Monitor, reassess vital signs every 3-5 minutes, and transport.

Quality Control Points		
Antidotes	Dopamine	Epinephrine IV
Hyperkalemia	Midazolam	

CONGESTIVE HEART FAILURE / ACUTE PULMONARY EDEMA

GENERAL TREATMENT:

- Maintain position in upright or semi-upright sitting position for SBP >100 and/or signs of adequate perfusion;
- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
  If signs of impending respiratory failure are present, initiate BVM assisted ventilation.
- Administer aspirin-324mg. (4-baby aspirin) PO to be chewed;
- Call for advanced life support (if not already dispatched), but **do not delay transport**.

BASIC TREATMENT:

- If associated chest pain or history of present illness includes chest pain or anginal-equivalent symptoms follow protocol for ischemic chest pain/acute coronary syndrome/STEMI and administer nitroglycerin as follows:
  If the patient has been previously prescribed, assist with administration:
  NTG - 0.4mg SL every 5-minutes
  Titrate to SBP ≥ 100 and symptoms/signs (recheck blood pressure after each dose given)
  Do not administer if erectile dysfunction medications have been recently used (see contraindications for nitro)
- If appropriate request ALS assistance **but do not delay transport.**

ADVANCED TREATMENT:

- Begin continuous EtCO2-monitoring;
- If moderate to severe respiratory distress:
  Initiate CPAP, as per CPAP procedure:
  If signs of impending respiratory failure prior to or following initiation of CPAP, proceed to assisted ventilation with BVM;
  Discontinue CPAP if the patient becomes hypotensive.
- Begin advanced airway management, as appropriate;
- Establish IV access with D5W to Keep Vein Open;
- Administer SL nitroglycerin - 0.4mg SL every 5-minutes:
  Titrate to SBP ≥ 100 and symptoms/signs (recheck blood pressure after each dose given);
  Do not administer if erectile dysfunction medications have been recently used (see contraindications for nitro).
- Initiate cardiac monitoring:
  Treat dysrhythmia as appropriate;
  Acquire and transmit 12-lead ekg per ALS 12-lead EKG procedure.
- If severe wheezing, consider 0.5% albuterol-2.5mg in 3cc normal saline nebulized.
  May repeat x 1 as needed.

Quality Control Points
CPAP

ISCHEMIC CHEST PAIN / ACUTE CORONARY SYNDROME / STEMI

INDICATIONS:

- Non-traumatic chest pain suspicious for acute coronary syndrome:
  Angina/myocardial infarction
- Anginal equivalent symptoms (typically in the presence of risk factors for, or prior history of coronary artery disease):
  Dyspnea +/- on exertion
  Light-headedness/generalized weakness
  Near syncope or syncope
  Diaphoresis
  Nausea/vomiting
- Maintain a high-index of suspicion for so-called 'atypical presentations', e.g., in diabetics or females.

★ For any patient under the age of 18 or patient being transported to a primary pediatric facility, Contact must be made to **OLMC** prior to administration of aspirin or nitroglycerin. ☎

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
- Acquire and transmit 12-lead EKG as per 12-lead EKG procedure.
- Administer aspirin-324mg (4-baby aspirin) PO to be chewed:★
  Do not withhold unless known allergy or history of anaphylaxis.

BASIC TREATMENT:

- Administer nitroglycerin as follows:★
  If the patient has been previously prescribed, assist with administration:
  NTG - 0.4mg SL every 5-minutes
  Titrate to SBP ≥ 100 and symptoms/signs (recheck blood pressure after each dose given)
  Do not administer if erectile dysfunction medications have been recently used (see contraindications for nitro).
- If appropriate request ALS assistance but **do not delay transport**

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

BLS 12-lead acquisition
Patients should be transported to most appropriate STEMI center per preferential transport guidelines.

ALS 12-lead acquisition
Suspected ACS/STEMI patients should be transported to most appropriate STEMI center per preferential transport guidelines.

ADVANCED TREATMENT:

- Initiate Cardiac Monitoring:
  Treat dysrhythmias as appropriate;
  If inferior wall MI, acquire right-sided lead tracing as time permits.
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Consider 250-500cc IV NS bolus if borderline or relative hypotension;
  Especially if 12-lead EKG findings are consistent with a suspected RV-Infarct.
- Administer SL nitroglycerin - 0.4mg SL every 5-minutes:★
  Titrate to SBP ≥ 100 and symptoms/signs (recheck blood pressure after each dose given);
  Do not administer if erectile dysfunction medications have been recently used (see contraindications for nitro).
- Consider ondansetron-4mg IV for severe nausea/vomiting.

Do not delay administration of SL NTG unless borderline or relative hypotension is present, especially in the face of a suspected RV infarct. Consider a fluid bolus prior to administration.

Quality Control Points	
Ischemic Chest Pain/ACS/STEMI	Odansetron

TACHYDYSRHYTHMIAS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
- Assess for hemodynamic instability:
  Symptoms/signs directly attributable to the tachycardia typically do not occur unless ≥ 150;
  As a rough rule, the upper limit of sinus tachycardia is approximately 220 - patient's age;
  Hypotension, or relative hypotension with signs of poor perfusion;
  ACS/Acute MI;
  Acute pulmonary edema;
- Call for Advanced Life Support (if not already dispatched), but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate cardiac monitoring and obtain 12-lead EKG:
  Evaluate rhythm for width, regularity and rate;
  Do Not Delay cardioversion in the presence of hemodynamic instability.
- Establish IV access with 0.9% sodium chloride (NS) to KVO:

Medication Consideration

If time permits and if adequate respirations, consider sedation prior to cardioversion:
midazolam-2mg IV/IO or 2 - 10mg IN titrate to effect
Or only if midazolam is not available; lorazepam-1mg IV/IO.
Continuous EtCO2 monitoring should be applied prior to sedation.

IF UNSTABLE:

Narrow complex (QRS < 0.12 sec)

Regular: (SVT: PAT or atrial-flutter)

- **Synchronized cardioversion**: 100 joules, then 200, 300, 360 joules if no response;
- While preparing for cardioversion, administer Adenosine 12 mg IV/IO with 0.9% sodium chloride (NS) flush;
  May repeat x 1 in 2-minutes;
- Administer 250cc NS IV bolus if suspected hypovolemia.

Irregular: (atrial fibrillation)

- **Synchronized cardioversion**: 100 joules, then 200, 300, 360 joules if no response.

Wide complex (QRS >0.12 sec)

Regular: (ventricular tachycardia, possible SVT with aberrancy or underlying BBB/IVCD)

- **Synchronized cardioversion**: 100 joules, then 200, 300, 360 joules if no response;

Irregular: (atrial fibrillation with aberrancy or BBB/IVCD)

- **Synchronized cardioverion**: 100 joules, then 200, 300, 360 joules if no response.

IF STABLE:

Narrow complex (QRS < 0.12 sec)

Regular: (SVT/presumed PAT)

- Consider vagal maneuvers (**do not** perform carotid massage);
- If no response, administer adenosine 12 mg. IV/IO with NS flush and may repeat x 1 in 2-minutes;
- If suspected sympathomimetic toxidrome: (methamphetamine, cocaine)
  Administer midazolam-2-4 mg IV/IO
  or 10mg IM/IN ;
  Or lorazepam-2mg IV/IO.

Irregular: (atrial fibrillation)

- Administer diltiazem-0.25mg/kg (20mg max) slow IVP over 5-minutes;
  If no response 0.35mg/kg (25mg max);
- If rate-control achieved and pump available, start diltiazem infusion- 5mg/hr IV. (see chart)

Wide complex:

Regular: (ventricular tachycardia, possible SVT with aberrancy or underlying BBB/IVCD)

- Administer amiodarone-150mg IV/IO over 10-minutes, and may repeat x1 if no response;(chart)
- If presumed hyperkalemia (wide complex rhythm, 12-lead EKG findings, dialysis history):
  calcium chloride-1gm IV slow push
  8.4% sodium bicarbonate-1mEq/kg
  May repeat 0.5mEq/kg every 10-minutes as needed, contact **OLPG** for consultation.☎
- If polymorphic VT (torsades de pointes), administer magnesium sulfate-2gm IV/IO slow push over 2-minutes.

Irregular:

- Monitor and transport

Quality Control Points		
Dialtizem	Hyperkalemia	Midazolam

LOUISVILLE METRO EMS PROTOCOLS

BACK NEXT

ABDOMINAL PAIN

INDICATIONS:

- Non-traumatic abdominal pain including e.g.:
  - Appendicitis
  - Diverticulitis
  - Abdominal aortic aneurysm
  - Gall bladder disease
  - Ectopic pregnancy
  - Bowel Obstruction
  - Pancreatitis

SPECIAL PRECAUTIONS

- Abdominal pain may be the first warning of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated abdominal viscus, etc.). Since the bleeding is not apparent, you must think of volume depletion and monitor the patient closely to recognize shock.

GENERAL TREATMENT:

- Administer oxygen, if indicated:
  Titrate to saturation ≥ 95% and work of breathing.
- Consider possible causes and follow other protocols, as appropriate, e.g.:
  - Ischemic chest pain/ACS/STEMI
  - Overdose/poisoning
  - Diabetic Emergency
  - OB/Gyn Emergencies
- Assess for hemodynamic instability, follow Shock protocol if appropriate;
- If appropriate request ALS assistance but **do not delay transport.**

ADVANCED TREATMENT:

- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Use caution with fluid administration in patients with suspected vascular catastrophe (Maintain SBP @ 90mmHg);
- For moderate-to-severe acute pain (> 6/10) on the Pain Scale:
  Consider pain management protocol.
- For severe nausea/vomiting:
  Administer ondansetron-4mg IV/IO/IM;
  May repeat x 1 in 10-minutes, contact **OLPG** for consultation.☎

Quality Control Points
Ondansetron

ALLERGIC REACTION / ANAPHYLAXIS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Assist ventilations as appropriate;
- Remove inciting agent, if possible (e.g., scrape off stinger).

BASIC TREATMENT:

- If wheezing/bronchospasm is present:
  Consider 0.5% albuterol-2.5mg in 3cc 0.9% sodium chloride (NS) nebulized;
  May repeat x 1 in 5-minutes;
- If **severe symptoms/signs** are present, for patients weighing >30kg:
  Administer epinephrine-0.3mg of 1:1000 solution IM, or
  Administer Epi Pen auto injector IM if previously prescribed x 1.
  If no response, epinephrine may be repeated x 2 total, every 5-10 minutes, contact **OLPG** for consultation. ☎
- Call for ALS assistance, but **do not delay transport**.

Severe Signs and Symptoms:

- Urticaria/rash and/or exposure to known allergen
- Stridor
- Oropharyngeal swelling/difficulty swallowing/throat tightening
- Severe dyspnea
- Wheezing with accessory muscle use
- Poor air-movement
- Difficulty speaking in full sentences
- Hypotension +/- signs of shock

ADVANCED TREATMENT:

- Begin continuous EtCO2-monitoring if respiratory distress is present.
- Initiate advanced airway management, as appropriate.
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Initiate IV/IO fluid bolus of 250-500c for hypotension, and may repeat for a total of 2L;
- If not already given, administer epinephrine as above:
  If no response, epinephrine may be repeated x 2 total, every 5-10 minutes, contact **OLPG** for consultation. ☎
- Administer diphenhydramine-1mg/kg (min. dose 25mg; max. dose 50mg) IV/IO/IM.
- If wheezing/bronchospasm is present:
  Consider 0.5% albuterol-2.5mg with 0.02% ipratropium bromide in 3cc 0.9% sodium chloride (NS) nebulized x 1;
  May repeat 0.5% albuterol-2.5 mg in 3cc 0.9% sodium chloride (NS) every 5-15 minutes as needed for a total of 3-additional doses;
- Consider methylprednisolone-125mg IV/IO.

If signs of anaphylaxis/anaphylactic shock are present (stridor and/or hypotension):

Do not delay treatment with IV Epinephrine as follows:

Administer 1:10,000 epinephrine-1mg (10cc) in 1L 0.9% NS IV/IO and infuse at 1cc/minute (1mcg/minute).

Alternatively, 1:1000 epinephrine-1mg (1cc) in 1L 0.9% NS IV/IO at 1cc/minute may also be used instead.

Titrate to effect by increasing/ decreasing infusion rate by 1cc/min (1mcg/minute), every 1-minute. (see chart)

Quality Control Points		
Epinephrine IM	Epinephrine IV	Methylprednisolone

ALTERED MENTAL STATUS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Assist ventilations as appropriate;
- Follow other protocols as appropriate:
  Carbon monoxide exposure
  Diabetic emergencies
  Seizures/status epilepticus
  Stroke/CVA/TIA
  Toxidrome/poisoning/substance abuse/overdose
  Trauma
- Check blood glucose concentration and if ≤ 60mg/dl:
  Administer glucose 15 G buccal if conscious and able to tolerate.
- Call for ALS assistance, but **do not delay transport**.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Notify and transport to the most appropriate facility per preferential transport guidelines.

ADVANCED TREATMENT:

- Begin advanced airway management as appropriate;
- Initiate cardiac monitoring;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open;
- If blood glucose concentration still ≤ 60mg/dl:
  Administer Dextrose 50%- 25 grams IV;
- If IV access cannot be obtained administer glucagon 1mg IM/IN;
- If altered mental status, and alcoholism/malnourishment:
  Administer thiamine 100mg IV/IM.

Consider protocols below and treat as noted:

- If narcotic overdose is suspected (see substance abuse/overdose protocol):
  Administer naloxone 0.4 - 2.0mg IV/IO/IN and may repeat every 5 minutes to a max dose of 10mg.
- If signs of shock refer to shock protocol.
- If patient exhibits signs of organophosphate poisoning (see poisoning protocol):
  Administer atropine 2 mg IV repeat as noted in poisoning protocol.
- If patient is suspected of TCA overdose (see overdose protocol):
  Administer 8.4% sodium bicarbonate 1mEq/kg IV, repeat as noted in overdose protocol.
- For suspected beta-blocker overdose (see overdose protocol):
  glucagon 1mg IV/IO slow push over 1 minute;
  May repeat at 2mg IV/IO slow push over 1-minute x2.
- For suspected calcium channel-blocker overdose (see overdose protocol):
  calcium chloride 1gm IV slow push.
- If dystonic reactions is suspected (see overdose protocol):
  Administer diphenhydramine 1mg/kg (min. dose 25mg; max. dose 50mg) IV/IO/IM.

Quality Control Points
Antidotes

ASTHMA/COPD/WHEEZING

INDICATIONS:

- Exacerbation of previously diagnosed asthma or COPD:
  Characterized by some combination of
  Wheezing
  Tachypnea
  Accessory muscle use/retractions
  Inability to speak in full sentences;
- Wheezing due to suspected asthma or suspected COPD

Oxygen administration in COPD Patients:
A patient with history of COPD may have normal lower baseline oxygen saturations, so do not automatically place on high flow oxygen.
- Start 2-3 LPM O2 by nasal cannula
- Titrate to patient's baseline oxygen saturation or 88% - 92%, and work of breathing

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Unless there is a history COPD (see side note).

BASIC TREATMENT:

- If wheezing/bronchospasm is present:
  Consider 0.5% albuterol-2.5mg in 3cc 0.9% sodium chloride (NS) nebulized; and may repeat x 1 in 5-minutes;
  Not indicated for wheezing associated with acute pulmonary edema.
- If clinical picture worsens or if initial presentation of impending respiratory failure, follow protocol for Respiratory distress/failure and Drug Assisted Intubation;
- Call for ALS assistance, but **do not delay transport.**

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Provide hospital notification for patients in severe distress.

ADVANCED TREATMENT:

- Begin continuous EtCO2-monitoring;
- If moderate to severe respiratory distress:
  Initiate CPAP, as per CPAP procedure:
  If signs of impending respiratory failure prior to or following initiation of CPAP, proceed to assisted ventilation with BVM;
  Discontinue CPAP if the patient becomes hypotensive.
- Administer 0.5% albuterol-2.5mg with 0.02% ipratropium bromide-0.5mg in 3cc 0.9% sodium chloride (NS) nebulized x 1:
  May repeat 0.5% albuterol-2.5 mg in 3cc NS (only) every 5-15 minutes as needed for a total of 3-additional doses;
  Albuterol may be considered for severe wheezing in acute pulmonary edema (see protocol).
- Initiate cardiac monitoring and acquire 12-lead EKG;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Consider methylprednisolone-125mg IV/IO, especially for subacute presentation (e.g., > 1-2 days);
  Consider magnesium sulfate - 2gm in 50cc D5W over 10-15 minutes. (see chart)
- **For asthma only**: If either unable to cooperate with or otherwise tolerate nebulizer therapy or if impending respiratory failure, administer 1:1000 epinephrine-0.3mg IM (use caution in patient's with CAD).
  May repeat x 1 in 5-minutes, contact **OLPG** for consultation. ☎
- If impending respiratory failure, initiate advanced airway management.
  (see protocol for Respiratory distress/failure and Drug Assisted Intubation).

Quality Control Points		
CPAP	Epinephrine IM	Magnesium Sulfate
Methylprednisolone		

CARBON MONOXIDE EXPOSURE

GENERAL TREATMENT:

- Administer high flow oxygen:
  Assist ventilation, if appropriate;
- Follow other protocols as appropriate e.g.:
  Ischemic Chest Pain/ACS/STEMI
  Asthma/COPD/Wheezing
  Respiratory Distress or Failure/DAI
- Begin SpCO monitoring;
- Call for ALS assistance, but **do not delay transport.**

Special considerations:

Oxygen saturation (SPO2) may be a poor indicator of severity in CO poisoning.

Regardless of SpCO readings, always treat the condition of your patient.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Consider hospital with hyperbaric oxygen capabilities if patient is unconscious.

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- Initiate cardiac monitoring:
  Treat cardiac dysrhythmias;
- Establish IV/IO access of 0.9% sodium chloride (NS) as appropriate.

DIABETIC EMERGENCIES

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
- Determine blood glucose concentration;
- If patient is clinically or relatively hypoglycemic and conscious such that aspiration from oral intake is not a concern:
  Administer oral glucose 15 grams Bucal.
- If appropriate request ALS assistance, but **do not delay transport.**

ADVANCED TREATMENT:

Hyperglycemia:

- Establish IV access with 0.9% sodium chloride (NS):
  Consider 250mL – 500mL bolus to patients with severe hyperglycemia as appropriate to respiratory status (any signs/symptoms of pulmonary edema).

Hypoglycemia:

- Use D5W for IV access;
- Administer dextrose 50%- 25 grams (g) IV;
- If altered mental status, and alcoholism/malnourishment:
  Administer thiamine 100mg IV/IM;
- If IV access cannot be obtained administer glucagon 1mg IM/IN.

EXCITED DELIRIUM

GENERAL GUIDELINES:

- Protect yourself and other crew members;
- Approach patient in a calm and cautious manner:
  Attempt verbal de-escalation first;
- Use involuntary restraints only as a last resort.

Follow other protocols, as appropriate:

Overdose/poisoning
Altered mental status
Head trauma
Hyperthermia
Seizure
Cardiac arrest

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing when possible;
- Restrain, if necessary (*see* physical restraint procedure):
  In supine position to avoid positional asphyxia.
  In lateral decubitus position if aspiration risk.
- Begin passive and active cooling, as appropriate;
- Check blood glucose concentration and follow diabetic emergencies protocol, if appropriate;
- Call for assistance of Fire and/or Police as indicated by situation (if not already dispatched);
- Call for Advanced Life Support Assistance, but **do not delay transport**.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Provide transport to most appropriate facility per the preferential transport guidelines.
Notify hospital staff/security of impending arrival of combative/restrained patient.

ADVANCED TREATMENT:

- Administer midazolam– 2-4 mg IV/IO or 10mg IM/IN:
  May repeat x 1, contact **OLPG** for consultation. ☎
  Or Only if midazolam **is not available,**
  Administer lorazepam-2mg IV/IO;
- Begin continuous EtCO2 monitoring.
- Initiate cardiac monitoring and acquire 12-lead EKG:
  Do not delay transport for 12-lead acquisition.
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Consider fluid bolus-250-500c, and may repeat up to 2L max.
- For sudden witnessed cardiac arrest administer early, or for prolonged symptoms/signs:
  Administer 8.4% sodium bicarbonate-1mEq/kg IV/IO:
  May repeat 0.5mEq/kg every 10-minutes as needed, contact **OLPG** for consultation. ☎

Quality Control Points	
Excited Delirium	Midazolam

NAUSEA/VOMITING

GENERAL TREATMENT:

- Follow general guidelines for patient care, as appropriate:
  Gently position patient to facilitate airway (e.g., lateral decubitus position);
  Suction as necessary.

ADVANCED TREATMENT:

- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  If symptoms or signs of volume depletion (e.g., orthostatic, dry mucosae), consider administration of IV fluid bolus-250-500cc NS, and may repeat x 1.
- Consider possible causes and follow other protocols, as appropriate, e.g.:
  Ischemic chest pain/ACS/STEMI
  Head trauma
  Abdominal pain
  Toxidrome/poisoning/substance abuse/overdose
  Diabetic Emergencies
  Hyper/hypothermia
- May also be used in conjunction with any protocol where morphine sulfate is administered for pain, but it is not well-tolerated secondary to its GI effects;
- For severe nausea/vomiting:
  Administer ondansetron - 4mg IV/IO/IM;
  May repeat x 1 in 10-minutes, contact **OLPG** for consultation.☎

Quality Control Points
Ondansetron

OB/GYN EMERGENCIES

GENERAL TREATMENT:

- Administer high flow oxygen;
- Check for presentation (e.g. crowning, limb or cord presentation);
- If delivery appears imminent (crowning):
  Follow child birth procedure;
- Look for symptoms /signs of obstetrical complications (see below) and treat as indicated;
- Call for ALS or fire assistance if appropriate but **do not delay transport.**

Conditions that prompt immediate transport, despite the threat of delivery, include: prolonged membrane rupture, breech presentation, cord presentation, extremity presentation, evidence of meconium staining, and nuchal cord (cord around infants neck).

Special considerations for obstetrical complications:

- **Breech Presentation**
  If head does not deliver immediately, Place a gloved hand in the vagina with the palm toward the babies face with the index and middle fingers, form a "V" on either side of the infant's nose.
- **Prolapsed Umbilical Cord**
  Insert two fingers of a gloved hand to raise the presenting part of the fetus off of the cord;
  Positioning the mother in Trendelenburg or knee-chest-position may relieve pressure on the cord also;
  Instruct the mother to "pant" with each contraction to prevent her from bearing down.
- **Nuchal Cord**
  Examine neck for the presence of a looped (nuchal) umbilical cord during delivery. If cord is looped around the neck, gently slip it over the infant's head. If unable to do so, clamp and cut the cord.
  Results in high morbidity/mortality for both mother and child.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Transport to most appropriate OB facility and notify of impending arrival. Provide patient's obstetrician name if possible.

ADVANCED TREATMENT:

- Provide additional assessment to all patients (mother and child or multiple children):
  If newborn presents with signs of distress or hypoperfusion see newborn resuscitation protocol;
- Establish IV access with sodium chloride (NS) to Keep Vein Open:
  If patient presents with symptoms/signs of hemodynamic instability, initiate fluid resuscitation per shock protocol with large bore catheter.

Eclamptic Seizures:

- Initiate Continuous EtCO2 monitoring
- Administer midazolam-2-4mg IV/IO or 10mg IM/IN;
- Consider magnesium sulfate-1-4grams slow IV push over three minutes.

Quality Control Points	
Magnesium Sulfate	Midazolam

RESPIRATORY DISTRESS or FAILURE / DRUG ASSISTED INTUBATION

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  COPD patients may be maintained at oxygen saturations of 88%-92%, as tolerated, so do not automatically place on high flow O2.
- Follow other protocols, as appropriate, e.g.:

Non-traumatic cardiac arrest
Asthma/COPD/Wheezing
Acute pulmonary edema/CHF
Carbon monoxide Exposure
Shock/hypotension
Ischemic chest pain/ACS/
STEMI
Allergic reaction/anaphylaxis.

For severe respiratory distress;
Consider CPAP as per protocols for Acute pulmonary edema/congestive heart failure, or Asthma/COPD and Wheezing

BASIC TREATMENT:

- If signs of upper airway obstruction, attempt to clear airway by:
  Opening or positioning
  Use of NPA or OPA
  Foreign-body removal, as appropriate
  Heimlich maneuver, chest compressions;
- Assist ventilations with BVM for severe respiratory insufficiency/impending respiratory failure.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Notify receiving facility of impending arrival .

ADVANCED TREATMENT:

- Initiate continuous EtCO2 monitoring:
  maintain EtCO2 35-40;
- Consider underlying causes and follow other protocols, as appropriate
  For tension pneumothorax see needle thoracentesis procedure;
- For impending respiratory failure or anticipated loss of airway control, consider advanced airway management;

NASOTRACHEAL INTUBATION INDICATORS:
Patient is spontaneously breathing
Unable to achieve sufficient oral relaxation
No signs of facial instability or trauma

OROTRACHEAL INTUBATION INDICATORS:
Patient is unconscious; No gag reflex is present
Patient is apneic or has inadequate respirations
High risk of aspiration due to vomitus/hemorrhage

- Utilize adjuncts to facilitate orotracheal intubation, as follows:
  Maintain oxygen-2LPM by nasal cannula throughout procedure;
  Utilize suction, as necessary;
  Utilize cricoid pressure/Sellick's maneuver or BURP procedure, as needed;
  Utilize bougie as needed (see bougie procedure):
  If anticipated difficult intubation, or
  On 1st-attempt at intubation, or
  Following 1st failed attempt at intubation.
- If unable to intubate or achieve sufficient patient relaxation prior to intubation:
  Pre-oxygenate with 100% oxygen via appropriate delivery device;
  Consider drug-assisted intubation (DAI) with etomidate - 0.3mg/kg IV/IO;
  If insufficient sedation, consider an additional dose of 0.1mg/kg IV/IO; (see chart)
  Adjuncts may be utilized for DAI, as above;
- Consider use of blind-insertion supraglottic rescue airway (King, or other if available), if intubation unsuccessful after 2-attempts (< 30-seconds/attempt),
- If further sedation is required once intubated:
  Consider midazolam-2mg IV/IO or 10mg IM for SBP > 100;
  May repeat x1, contact **OLPG** for consultation.☎
- If unable to maintain an airway via BVM, supraglottic or ET device:
  Utilize quick trach II for airway obstructions (see quick trach II procedure).

Etomidate Intubations

SEIZURES/STATUS EPILEPTICUS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- Position patient to avoid injury and/or aspiration:
  Consider gently placing in lateral decubitus position;
- Check blood glucose concentration and follow diabetic emergency protocol, as appropriate;
- Follow other protocols as appropriate:
  Trauma
  Toxidrome/poisoning/substance abuse/overdose
  OB/gyn emergencies
- If ongoing seizures or status epilepticus (≥ 2 seizures without an intervening lucid period):
  Call for Advanced Life Support assistance, but **do not delay transport**.

ADVANCED TREATMENT:

- Begin continuous EtCO2-monitoring;
- Initiate advanced airway management, as appropriate;
- If actively seizing or in status epilepticus:
  Administer midazolam-2-4mg slow IV/IO push or 10mg IM/IN;
  May repeat x1 in 5-minutes, contact **OLPG** for consultation. ☎
  Or only if midazolam is not available:
  Administer lorazepam-2mg IV/IO;
  May repeat x1 in 5-minutes, contact **OLPG** for consultation. ☎
- Monitor carefully for respiratory depression and need for assisted ventilation following treatment with either agent;
- If patient is post-ictal and not actively seizing, pharmacologic therapy with either agent is not indicated;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Do not delay treatment by IM route;
- If suspected eclampsia:
  Consider magnesium as per OB/Gyn emergencies protocol;
- If suspected alcohol withdrawal seizure:
  Consider thiamine as per Altered Mental Status protocol;
- Begin cardiac monitoring and acquire 12-lead EKG, if possible:
  Do not delay transport for 12-lead acquisition.

Quality Control Points	
Magnesium Sulfate	Midazolam

SHOCK/HYPOTENSION

INDICATIONS:

- SBP < 90;
- Relative hypotension with signs and symptoms of shock.

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- If trauma, follow protocol and control external hemorrhage, as appropriate;
- Place patient in a supine position as appropriate and as tolerated;
- Follow other protocols as appropriate:
  Allergic reaction/anaphylaxis
  Hypoglycemia
  Ischemic chest pain/ACS/STEMI
  Trauma
- Call for ALS assistance if available, but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- Perform needle thoracentesis if suspected tension pneumothorax;
- Establish IV/IO access of 0.9% sodium chloride (NS):
  Consider a fluid bolus of 250-500cc, as appropriate;
  May repeat to maximum infusion of 2L:
  Use caution if suspected acute pulmonary edema;
- For trauma, titrate to SBP = 90 or presence of radial pulse:
  Consider additional fluid boluses if signs of hemodynamic decompensation, contact **OLPG** for consultation. ☎
- Initiate cardiac monitoring, treat cardiac dysrhythmias, and acquire and transmit 12-lead EKG
  (as per ALS procedure for 12-lead EKG);
- If no response to adequate attempt at fluid resuscitation or other protocol interventions (see BLS), and trauma is not suspected:
  Begin dopamine-10 µg/kg/min IV/IO infusion; (see chart)
  Titrate to SBP ≥ 90, signs of improvement of initial decompensation, and maximum dose of 20 µg/kg/min.

Quality Control Points
Dopamine

STROKE/CVA/TIA

INDICATIONS:

- Any positive finding(s) on the modified Cincinnati Prehospital Stroke Scale (see below):
  - Facial droop
  - Pronator drift
  - Speech/language
  - Time of onset:
    - When was patient last seen in usual normal state, i.e., without any signs of the above?
      - This may require eliciting history from patient, family or bystanders.

Time Frame/Onset
Crew members should try to transport a witness of the onset of symptoms to assist receiving physicians in determining the time the patient was last seen normal.

GENERAL TREATMENT:

- Administer oxygen and titrate to oxygen saturation ≥ 95% and work of breathing;
- Check blood glucose concentration and follow diabetic emergency protocol, as appropriate.

BASIC TREATMENT:

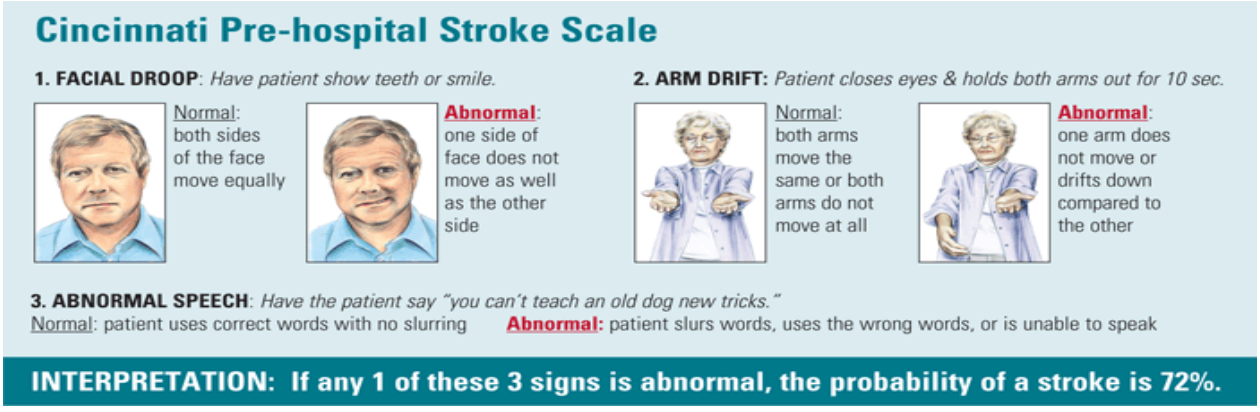
- Call for ALS assistance if patient in extremis (e.g., impending respiratory failure) or may require other ALS intervention, but **do not delay transport;**
- Document all findings from the modified Cincinnati Prehospital Stroke Scale.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Notify and transport to closest appropriate facility per the preferential transport guidelines

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- In hemodynamically/clinically stable patients, **do not delay preferential transport** to the closest Stroke Center for either of the following:
  - Initiating cardiac monitoring;
  - Establishing IV access with 0.9% sodium chloride (NS) to Keep Vein Open.
- Follow other protocols, as appropriate, for:
  - Seizure
  - Altered mental status



TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE

INDICATIONS:

- Exposure to toxic substances from:
  - Ingestion
  - Inhalation
  - Injection
  - Skin absorption
- Intentional/accidental exposure to pharmacological substances.

The primary goal of physical assessment of the poisoned patient is to identify effects on the three vital organ systems most likely to produce immediate morbidity and/or mortality:

- Respiratory system
- Cardiovascular system
- Central nervous system

GENERAL TREATMENT:

- Administer oxygen:
  - Titrate to oxygen saturation ≥ 95% and work of breathing;
  - Assist Ventilations, if indicated;
- Use patient and/or bystanders statements and answers to determine substance(s) involved;
- If poisoning or toxic exposure:
  - Remove patient from toxic environment as quickly as possible, remove clothing and decontaminate;
    - This should be performed by trained personnel with the appropriate PPE.
- Determine Blood Glucose concentration;
- Follow other protocols, as appropriate e.g.:

Bradydysrhythmias | Diabetic Emergencies | Hyperthermia/Hypothermia
Tachydysrhythmias | Excited Delirium

- Call for ALS assistance, if indicated, but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- Begin cardiac monitoring:
  - Evaluate rhythm for width, regularity and rate;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  - Follow protocol for shock/hypotension, if appropriate;
- If symptoms/ signs of cardiac or respiratory compromise, hemodynamic instability, or altered mental status consider the following:

SPECIAL CONSIDERATIONS:

- **Suspected Tricyclic/Antidepressant Overdose:**
  - Administer 8.4% sodium bicarbonate-1mEq/kg;
    - May repeat 0.5mEq/kg every 10-minutes as needed, contact **OLPG** for consultation. ☎
- **Suspected Beta Blocker Overdose:**
  - Administer glucagon-1mg IV/IO slow push over 1 minute;
    - May repeat at 2mg IV/IO slow push over 1-minute x2.
- **Suspected Calcium Channel Overdose:**
  - Administer calcium chloride-1 gram IV slow push.
- **Suspected Dystonic Reaction:**
  - Administer diphenhydramine-1mg/kg (min. dose 25mg; max. dose 50mg) IV/IO/IM.
- **Suspected Organophosphate Poisoning:**
  - Administer atropine 2mg IV/IO initial dose;
    - Repeat at 4mg every 3-minutes until fully atropinized (secretions dried).
- **Suspected Opiate/Opioid Overdose:**
  - Administer naloxone-0.4 - 2mg IV/IO/IN and may repeat every 5-minutes to a maximum dose of 10mg.
- **Suspected Cocaine/Amphetamines Overdose:**
  - Administer midazolam 2-4mg IV/IO or 10mg IM/IN;
    - **Or if midazolam is not available**, administer lorazepam-2mg IV/IO.
  - Begin EtCO2 monitoring prior to benzodiazepine administration.

Quality Control Points	
Antidotes	Midazolam

LOUISVILLE METRO EMS PROTOCOLS

ENVIRONMENTAL EMERGENCIES

BACK NEXT

HYPERTHERMIA

INDICATIONS:

- Elevated body temperature related to heat exposure;
- Altered mental status related to heat exposure.

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
- Move patient to a cool place away from any external heat source if possible;
- If appropriate request ALS assistance but **do not delay transport.**

Mild symptoms (heat cramps, heat exhaustion) No signs of altered mental status (body temperature <104):

- Help facilitate passive cooling:
  Loosen clothing, remove excessive clothing;
- If available administer PO fluids:
  Use caution if patient presents with nausea and vomiting.

Severe symptoms (heat stroke): Signs of altered mental status (body temperature 104-105)
Patient may or may not still be sweating

- Begin active cooling:
  Use sheets or towels dipped in ice water on exposed skin;
  Place ice packs behind neck, in axillae, and groin areas;
  If shivering starts, temperature drops <102, or Altered mental status improves Stop Active cooling.
- Determine Blood Glucose concentration.

ADVANCED TREATMENT:

- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Initiate IV/IO fluid bolus of 250-500c for hypotension, and may repeat for a total of 2L;
- If uncontrolled shivering occurs during cooling begin continuous EtCO2 monitoring and;
  Administer midazolam 1-2 mg IV/IO/IN.
  Or only if midazolam is not available,
  Consider lorazepam 0.5 – 1mg IV.

Quality Control Points
Midazolam

HYPOTHERMIA

INDICATIONS:

- Decreased body temperature related to cold exposure:
- Altered Mental Status related to cold exposure.

GENERAL TREATMENT:

Patients found in cardiac arrest secondary to hypothermia, should be re-warmed prior to determination of death

- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
- Decrease on-going heat loss ASAP:
  Move the patient to a warm area (if possible);
  Dry and insulate the patient;
- Handle the patient gently, allowing no patient exertion;
  (rough handling of severely hypothermic patients may cause V-fib)
- Remove all wet clothing (CUT OFF to decrease patient movement);
- Apply "passive external rewarming" with blankets and the warm ambulance;
- Conscious patients should avoid heated oral fluids.
- If severe hypothermia suspected:
  Assess respirations and pulse carefully (up to 1 minute) as both may be very slow but still adequate for patient's slow metabolism;
  Provide expeditious, non-emergency transport.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Initiate cardiac monitoring:
  Acquire 12-lead EKG as per ALS 12-lead EKG procedure;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open;
- Follow other protocols as appropriate:
  Diabetic Emergencies
  Toxidrome/Poisoning/Substance Abuse/Overdoses

In severe Hypothermia:

- If ventricular fibrillation is present, administer one defibrillatory shock at 360j;
  If restored to a perfusing rhythm follow appropriate protocol.

NEAR DROWNING

INDICATIONS:

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Assist ventilations as appropriate;
- Immobilize the cervical spine if indicated by the mechanism of injury (see c-spine clearance procedure);
- Assess respiratory function:
  Pay close attention to work of breathing and breath sounds;
- If hypothermia is suspected:
  Remove wet clothing and dry patient;
  Follow hypothermia protocol.
- Call for ALS assistance if appropriate, but **do not delay transport**.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Begin continuous EtCO2 monitoring if respiratory distress is present;
- Initiate CPAP, as appropriate:
  If signs of impending respiratory failure prior to or following initiation of CPAP, proceed to assisted ventilation with BVM, endotracheal tube or supraglottic airway;
  Discontinue CPAP if the patient becomes hypotensive.
- Initiate cardiac monitoring and treat cardiac dysrhythmias;
- Establish IV/IO access with 0.9% sodium chloride (NS) to keep vein open.

Quality Control Points
CPAP

REPTILE ENVENOMATION

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
- Remove all jewelry on affected limb:
  Immobilize below the level of the heart;
- Do no use constricting bands or tourniquets;
- If stinger is present attempt to brush away with edge of card (e.g. driver's license, credit card):
  Do not pinch or attempt to pull it out;
- Do not disturb wound site.
- Follow other protocols as appropriate e.g.:
  Bradydysrhythmias
  Tachydysrhythmias
  Diabetic emergencies
  Excited delirium
  Hyperthermia/hypothermia
  Shock/hypotension

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Consider other advanced treatment as appropriate:
  Initiate cardiac monitoring and treat cardiac dysrhythmias;
  IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open.

LOUISVILLE METRO EMS PROTOCOLS

ADULT TRAUMA

BACK NEXT

TRAUMA

GENERAL TREATMENT:

- Ensure airway while protecting the cervical spine;
- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- Treat Injuries/Control bleeding as needed (see injury matrix below for reference);
- Determine the need for C-spine Immobilization as indicated in the c-spine clearance procedure;
- Assess for hemodynamic instability, follow Shock protocol if appropriate;
- Call for ALS assistance, if needed, but do not delay transport:
  Refer to general guidelines for Level 1 trauma center transport indications.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Initiate cardiac monitoring;
- Establish IV/IO access with 0.9% sodium chloride (NS) to keep vein open:
  Do not Delay Transport for IV access;
- Consider fluid resuscitation only if signs of hemodynamic decompensation and/or unable to palpate radial pulses (SBP ≤80-90):
  Establish access with large bore catheter and consider second access site if indicated by symptoms/signs;
- As noted in injury matrix below, consider chest decompression if indicated;
- Consider pain management, if appropriate.

Head/Neck Injures

- Follow C-spine Clearance procedure to determine need of C-spine immobilization

Chest Injures

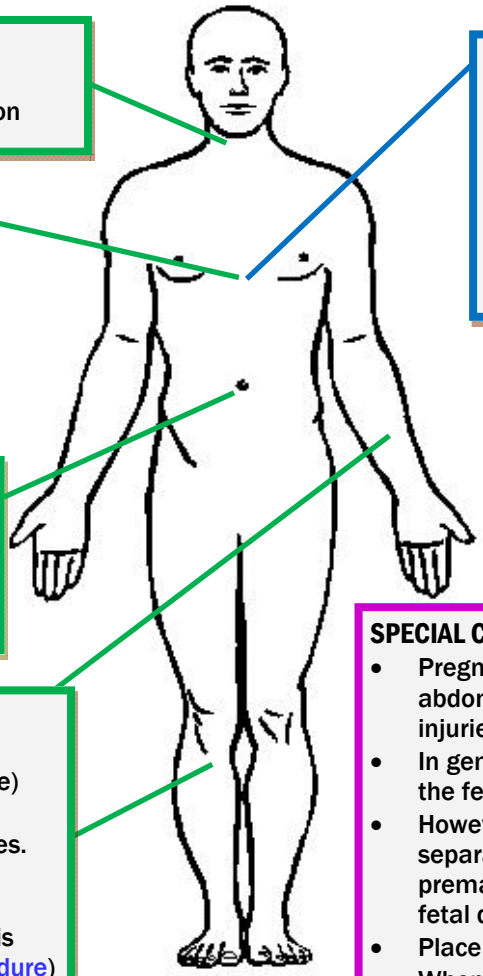
- Control bleeding
- Stabilize impaled objects
- Stabilize flail segments.
- Cover open chest wounds with sterile occlusive dressing

Abdominal Injuries

- Control bleeding
- Stabilize impaled objects.
- Cover eviscerations with saline-moistened gauze.

Extremity Injuries

- Splint according to injury
  (e.g. traction splint for femur fracture)
  Splint in a neutral position.
- Apply sterile dressings to open fractures.
  Do not push exposed bone “back in”
- Control bleeding with direct pressure
  Utilize tourniquet device if bleeding is not controlled (see tourniquet procedure)
- Do not attempt to reduce dislocations in the field.



Chest Injures

- If open chest wound
  Observe closely for signs of developing tension pneumothorax
- If a tension Pneumothorax is suspected, perform chest decompression on the affected side per the needle thoracentesis procedure.

SPECIAL CONSIDERATIONS: The Pregnant Patient

- Pregnant victims involved in major trauma to the abdomen are more susceptible to life-threatening injuries.
- In general, the fluid-filled gravid uterus protects the fetus from blunt trauma.
- However, direct trauma may result in premature separation of the placenta from the uterine wall, premature labor, uterine rupture, abortion and fetal death.
- Place patient in left lateral recumbent position
- When determining most appropriate facility per destination guidelines; trauma indicators/ mechanism of injury takes precedent over patient’s OB hospital of choice.

AMPUTATED BODY PART CARE

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- Control bleeding with direct pressure and elevation if possible;
- Cover the stump with a saline-soaked sterile dressing:
  Then wrap with a dry dressing;
- Wrap the severed part in a saline-moistened sterile dressing:
  Place in a watertight plastic bag;
  Place the bag in a cooler with ice (if possible;
  Do not freeze;
  Do not macerate (soak in water).
- Follow other protocols as appropriate:
  Trauma
- Call for ALS assistance, if needed, but **do not delay transport.**

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Provide notification and transport to most appropriate facility per the preferential transport guidelines

ADVANCED TREATMENT:

- Assess for hemodynamic instability;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open, if appropriate;
- If isolated injury consider pain management, see pain management protocol.

BURNS

GENERAL TREATMENT:

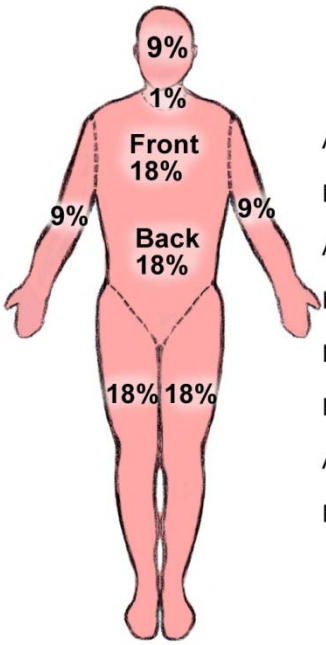
- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Assist ventilation as appropriate;
- Stop the burning process:
  Remove dry chemicals, flush affected area with copious amounts of water;
  Remove contaminated patient clothing;
  Remove clothing and jewelry in the area of the burn and distal to the injured area;
  For chemical burns of the eye, flush eyes with copious amounts of normal saline or water;
  Attempt to cool affected area.
- Determine blood glucose concentration;
- Monitor SpCO levels;
- Estimate TBSA affected and depth of burns (i.e. superficial, partial thickness);
- Apply dressings to burns as tolerated:
  In burns under 10% TBSA use moist dressings.
  In burns over 10% TBSA apply a dry burn sheet or dry sterile dressing and insulate the patient over this dressing to help prevent hypothermia.
- Request ALS for serious burns or electrical burns, but **do not delay transport.**

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

If patient presents with severe symptoms/signs, e.g. burns over 10% respiratory involvement, or circumferential burns transport to burn center and provide radio notification of your impending arrival.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate:
  Observe for signs of inhalation injury (e.g. stridor, muffled voice, singed facial/nasal hairs, carbonaceous sputum);
  If signs of inhalation injury are present, be prepared to secure the airway.
- Establish large bore IV access x 2 with 0.9% sodium chloride (NS) and follow guidelines below:
  Fluid to be administered = 4cc x patient's weight x %TBSA, with half of fluids being administered in the first 8 hours after time of injury;
  IVs may be inserted through the burn area if necessary.
- Initiate cardiac monitoring and obtain 12 lead EKG, especially when the injury involves an electrical burn:
  Treat cardiac dysrhythmias according to specific protocol;
- Consider pain management, see pain management protocol.



Adult body	% of total
Part	BSA
Arm	9%
Head	9%
Neck	1%
Leg	18%
Anterior trunk	18%
Posterior trunk	18%

PAIN MANAGEMENT

INDICATIONS:

- For moderate-to-severe pain (> 6/10) on the Pain Scale (see below), associated with:
  - ⇒ Burns (in the absence of suspected or potential air-way or other respiratory compromise)
  - ⇒ Isolated extremity Injury
  - ⇒ Other pain syndromes, e.g.:
    - Abdominal pain
    - Sickle cell crisis

Contraindications:

- SBP < 100; oxygen saturation < 95%.
- If chest pain, this protocol is superseded by Ischemic chest pain/ACS/STEMI protocol.
- This protocol does not apply if pain associated with suspected:
  - Obstetric emergency, e.g., imminent delivery
  - Head trauma
  - Cervical spine injury
  - Altered mental status, e.g., overdose or intoxication.

GENERAL TREATMENT:

- Administer oxygen:
  - Titrate to oxygen-saturation ≥ 95% and work of breathing;
- Place patient in position of comfort and splint any injured extremities, as appropriate;
- Follow applicable protocols, e.g.:
  - Trauma/burns
  - Abdominal pain
- Assess pain using Pain Scale for arrival of ALS on-scene;
- Call for Advanced Life Support assistance, but **do not delay transport**.

ADVANCED TREATMENT:

- Initiate cardiac monitoring;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open:
  - Administer fluid bolus-250-500cc IV as appropriate, e.g.:
    - Burns
    - Hypotension (if multi-trauma and no palpable radial pulse (SBP<90)
    - Sickle cell crisis
- Apply continuous EtCO2 monitoring;
- Administer morphine sulfate- 2-4 mg IV/IO/IM and may repeat 2.0 mg every 5-minutes to maximum of 10mg, contact **OLPG** for consultation. ☎
- Titrate to pain relief (document Pain Scale) and respiratory/hemodynamic status (SBP >90, O2-saturations ≥ 95%, etCO2 <40);
- If respiratory depression occurs following morphine administration:
  - Assist ventilations and administer naloxone-0.4mg-2mg IV/IO/IN, titrated to respiratory status;
- Monitor and document vital signs and assess Pain Scale following each dose of morphine administered;
- For associated nausea and/or vomiting administer ondansetron 4mg IV/IO, as per Nausea and vomiting protocol.

Quality Control Points	
Morphine	Ondansetron

LOUISVILLE METRO EMS PROTOCOLS

PEDIATRIC CARDIAC

BACK NEXT

BRADYDYSRHYTHMIAS

INDICATIONS:

- Heart rate < Normal range or relative bradycardia;

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥95% and work of breathing;
- **Do not delay** in assisting ventilation - most cases of pediatric bradycardia have respiratory causes;
- Assess for cardiopulmonary compromise:
  Initiate CPR if heart rate is less than 60 with signs of hypoperfusion;
- Call for Advanced Life Support and Fire assistance (if needed), but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate cardiac monitoring and obtain 12-lead EKG:
  Evaluate rhythm for width, regularity and rate;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open.

If unstable:

- Administer epinephrine 0.01 mg/kg (0.1 mL/kg 1:10,000):
  May repeat every 3-5 minutes;
- Consider atropine 0.02 mg/kg (for increased vagal tone & primary av block):
  Minimum dose 0.1 mg and Max single dose 0.5 mg;
  May repeat once;
- Consider external pacing:
  0-36 months old start at 120bpm 36 months - 12 years start at 100bpm >12 years old start at adult rate (80bpm)
- If time permits and if adequate respirations, consider sedation prior to or during pacing:
  Administer midazolam-0.05-0.1 mg/kg IV/IO/IN (max single dose 2mg)
  Or if midazolam is not available; administer lorazepam-0.1mg/kg IV/IO (max single dose 2mg);

If no response consider:

- **For hypotension:**
  Administer fluid bolus 20 mL/kg, may repeat twice;
  Additional fluids may be requested, by **OLMC Order.** ☎
- **For suspected prolonged/severe acidosis:**
  Consider 8.4% sodium bicarbonate-1 mEq/kg, by **OLMC Order;** ☎
  4.2% concentration recommended for infants younger than one month.
- **For suspected beta-blocker overdose:**
  Consider glucagon-0.07 mg/kg (max 5 mg) IV/IO slow push over 1-minute, by **OLMC Order.** ☎
- **For suspected calcium channel-blocker overdose:**
  Consider calcium chloride-20mg/kg (0.2 mL/kg) IV/IO slow push, by **OLMC Order.** ☎

If stable:

Monitor, reassess vital signs every 3-5 minutes, and transport.

Age	Heart Rate	Systolic BP	Age	Heart Rate	Systolic BP
0-3 months	120-150	85(+/-25)	3-4 years	100-110	100(+/-20)
3-6 months	120-130	90(+/-30)	5-6 years	100	100(+/-15)
7-10 months	120	96(+/-25)	7-9 years	90-100	105(+/-15)
11-18 months	110-120	100(+/-30)	10-12 years	80-90	115(+/-20)
19-35 months	110-120	100(+/-20)	>12 years	70-80	120(+/-20)

Quality Control Points

Antidotes Midazolam

NON-TRAUMATIC CARDIAC ARREST

GENERAL TREATMENT:

Begin CPR:

- 1 cycle = 15-compressions: 2-ventilations;
- Maintain continuous compressions at a consistent rate ≥100/minute:
  Push straight down at least 1 ½ to 2-inches with each compression and allow the chest to recoil completely;
  Avoid any interruption in compressions, except during AED analysis;
  Continue compressions even while AED is charging;
- Call for ALS and Fire assistance (if not already dispatched).

BASIC TREATMENT

Apply AED:

If arrest was witnessed by EMS or Fire
Immediately apply AED, follow prompts, analyze, and shock as indicated:

- Following each analysis (shock or no shock), perform approximately 2-minutes of CPR.

If arrest was not witnessed by EMS or Fire
Perform 2-minutes of CPR before analyzing:

- Following each analysis (shock or no shock), perform approximately 2-minutes of CPR.

Following each analysis/2 minutes of CPR cycle:

- If signs of ROSC, continue to ventilate and initiate transport.
- If no ROSC, perform analysis/shock/CPR as indicated.

After ≥ 6-minutes of CPR have been completed:

- Consider supraglottic airway;
- AED may be switched to cardiac monitor/defibrillator, if ALS on-scene;
- Initiate transport if ALS not on-scene;
  Continue CPR without interruption;
- If transport is delayed, continue CPR and AED analysis.

WHEN NOT TO BEGIN RESUSCITATION

See Death Determination / Withholding Resuscitation Efforts

ADVANCED TREATMENT:

Begin or continue CPR as per pediatric Basic Life Support protocol:

- Initiate continuous EtCO2-monitoring and attempt to improve quality of CPR if etCO2 < 10mm Hg.

Initiate cardiac monitoring and rhythm analysis:

- **If AED already in place** switch to cardiac monitor/defib only after ≥ 6-minutes of CPR with AED have been completed.
- **If AED is not in place** apply cardiac-monitor/defibrillator as follows:
  If arrest was not witnessed by EMS or Fire, perform 2-minutes of CPR first;
  If arrest was witnessed by EMS or Fire, continue CPR but immediately apply cardiac-monitor defibrillator.

NEXT

Ventricular fibrillation
Pulseless ventricular tachycardia

- Defibrillate at 4joules/kg biphasic;
- Perform 2-minutes of CPR;
- If there is no change in the rhythm:
  Defibrillate at 4j/kg biphasic;
- Perform 2-minutes of CPR;
- If there continues to be **no change in the rhythm**:
  Continue to **defibrillate** at 4j/kg following each 2 minutes of CPR;
- Perform advanced airway management with endotracheal tube (1-attempt) or supraglottic device:
  Apply ITD and verify;

Intubation should be deferred until ≥ 6-minutes of CPR with or without 3 defib shocks have been administered, as long BVM ventilations are being successfully applied.

- Establish IV/IO access with 0.9% sodium chloride (NS);
- Administer epinephrine-0.01mg/kg (0.1ml/kg of 1:10,000) IV/IO:
  May repeat every 3-5 minutes;
- Administer amiodarone- 5 mg/kg IV/IO, and may repeat up to 2 times if no change.

Special Considerations

- **Only if suspected calcium channel blocker overdose:**
  Consider calcium chloride-20mg/kg (0.2ml/kg) Slow IV/IO with saline flush, by **OLMC Order.**☎
- **Only if suspected prolonged acidosis, hyperkalemia or tricyclic antidepressant overdose:**
  Consider 8.4% sodium bicarbonate, 1mEq/kg IV/IO. May repeat 0.5mEq/kg every 10-minutes, by **OLMC Order;**☎
  4.2% concentration recommended for infants younger than 1 month.
- **Only if suspected torsades de pointes:**
  Consider magnesium sulfate-25-50mg/kg (max 2gm) IV/IO, slow push over 2-minutes, by **OLMC Order.** ☎

Initiate transport:

- If ROSC or
- If no ROSC and the following has been performed:
  ≥ 6-minutes of CPR
  ≥ 3-defibrillations
  ≥ 1-dose each of vasopressin/epinephrine and amiodarone

Asystole or PEA

- Perform 2-minutes of CPR;
- If no change to shockable rhythm or ROSC after each cycle, continue CPR, and **immediately treat reversible causes**;
- Perform advanced airway management with endotracheal tube (1-attempt) or supraglottic device;
  Apply ITD and verify placement;

Intubation should be deferred until ≥ 6-minutes of CPR with or without 3 defib shocks have been administered, as long BVM ventilations are being successfully applied.

- Establish IV/IO access with 0.9% sodium chloride (NS);
- Administer epinephrine-0.01mg/kg (0.1ml/kg of 1:10,000) IV/IO
  May repeat every 3-5 minutes.

Special Considerations

- **Only if suspected hypovolemia:**
  Administer 20cc/kg fluid bolus, may repeat x2; otherwise run @ KVO;
  Additional fluids may be requested, by **OLMC Order.**☎
- **Only if suspected tension pneumothorax:**
  Follow procedure for needle thoracentesis.
- **Only if suspected cardiac tamponade:**
  Initiate rapid transport.
- **Only if suspected hypoglycemia:**
  Administer dextrose-2-4cc/kg of D25%.
- **Only if suspected calcium channel blocker overdose:**
  Consider calcium chloride-20mg/kg(0.2ml/kg) IV/IO, by **OLMC Order.**☎
- **Only if suspected prolonged acidosis, hyperkalemia or tricyclic antidepressant overdose:**
  Consider 8.4% sodium bicarbonate, 1mEq/kg IV/IO. May repeat 0.5mEq/kg every 10-minutes, by **OLMC Order;** ☎
  4.2% concentration recommended for infants younger than 1 month.
- **Only if suspected opiate overdose:**
  Consider naloxone-0.1mg/kg IV/IO and may repeat every 5-minutes to a maximum dose of 2mg.
- **Only if suspected beta-blocker overdose:**
  Consider glucagon - 0.07mg/kg (max 5mg) IV/IO slow push over 1-minute by **OLMC Order.**☎

Initiate transport:

- If ROSC or
- If no ROSC and the following has been performed:
  ≥ 6-minutes of CPR
  Potential reversible causes have been initially addressed

Quality Control Points		
Non-Traumatic Cardiac Arrests	Antidotes	Hyperkalemia
Needle Thoracentesis		

TACHYDYSRHYTHMIAS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥95% and work of breathing;
- Assess for hemodynamic instability:
  Hypotension, or relative hypotension with signs of poor perfusion;
  Acute pulmonary edema;
- Call for advanced life support and fire assistance (if not already dispatched), but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate cardiac monitoring and obtain 12-lead EKG:
  Evaluate rhythm for width, regularity and rate;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Do not delay cardioversion in the presence of hemodynamic instability.

Medication Consideration

If time permits and if adequate respirations, consider sedation prior to cardioversion:
midazolam-0.05-0.1mg/kg IV/IO/IN (max dose 2 mg)
Or if midazalom is not available;
lorazepam-0.1mg/kg IV/IO (max dose 2mg).

IF UNSTABLE:

Narrow complex (QRS < 0.09 sec)

SVT:

- Rate usually ≥220/min in infants and ≥180/min in children;
- Consider vagal maneuvers while preparing for synchronized cardioversion;
- Perform synchronized cardioversion:
  Begin with 0.5-1 J/kg;
  If not effective, increase to 2 J/kg.

Wide complex (QRS >0.09 sec)

Ventricular tachycardia:

- Perform synchronized cardioversion:
  Begin with 0.5-1 J/kg;
  If not effective, increase to 2 J/kg.

IF STABLE:

Narrow complex (QRS < 0.09 sec)

Sinus Tachycardia:

- Rate usually <220/min in infants and <180/min in children;
- Monitor and transport.

SVT:

- Rate usually ≥220/min in infants and ≥180/min in children;
- Consider vagal maneuvers;
- Administer adenosine:
  First dose–0.1 mg/kg IV/IO rapid bolus (max 6 mg);
  Second dose–0.2 mg/kg IV/IO rapid bolus (max 12 mg).

Wide complex (QRS >0.09 sec)

Ventricular Tachycardia:

- Administer amiodarone- 5mg/kg (150mg max) IV/IO over 20 minutes. (see chart)

Age	Heart Rate	Systolic BP	Age	Heart Rate	Systolic BP
0-3 months	120-150	85(+/-25)	3-4 years	100-110	100(+/-20)
3-6 months	120-130	90(+/-30)	5-6 years	100	100(+/-15)
7-10 months	120	96(+/-25)	7-9 years	90-100	105(+/-15)
11-18 months	110-120	100(+/-30)	10-12 years	80-90	115(+/-20)
19-35 months	110-120	100(+/-20)	>12 years	70-80	120(+/-20)

Quality Control Points

Midazolam

LOUISVILLE METRO EMS PROTOCOLS

PEDIATRIC MEDICAL

BACK NEXT

ABDOMINAL PAIN

INDICATIONS:

- Non-traumatic abdominal pain including e.g.:
  - Appendicitis
  - Constipation
  - Abdominal aortic aneurysm
  - Lactose Intolerance
  - Gastroenteritis
  - Bowel Obstruction
  - Pancreatitis

SPECIAL PRECAUTIONS

- Abdominal pain may be the first warning of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, perforated abdominal viscus, etc.). Since the bleeding is not apparent, you must think of volume depletion and monitor the patient closely to recognize shock.

GENERAL TREATMENT:

- Administer oxygen, if indicated:
  Titrate to saturation ≥ 95% and work of breathing.
- Consider possible causes and follow other protocols, as appropriate, e.g.:
  Overdose/poisoning
  Diabetic Emergency
- Assess for hemodynamic instability, follow Shock protocol if appropriate;
- If appropriate request ALS assistance but **do not delay transport.**

ADVANCED TREATMENT:

- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Use caution with fluid administration in patients with suspected vascular catastrophe (Maintain SBP @ 90mmHg);
- For moderate-to-severe acute pain (> 6/10) on the Pain Scale:
  Consider pain management protocol.
- For severe nausea/vomiting:
  Administer ondansetron-0.1 mg/kg (max dose 4mg) IV/IM May repeat x 1 in 10-minutes, all by **OLMC Order.** ☎

Quality Control Points
Ondansetron

ALLERGIC REACTION / ANAPHYLAXIS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Assist ventilations as appropriate;
- Remove inciting agent, if possible (e.g., scrape off stinger).

BASIC TREATMENT:

- If wheezing/bronchospasm is present:
  Consider 0.5% albuterol-2.5mg in 3cc 0.9% sodium chloride (NS) nebulized; and may repeat x 1 in 5-minutes;
- If **severe symptoms/signs** are present, for patients weighing <30kg:
  Administer epinephrine-0.15mg of 1:1000 solution IM, or
  Administer Epi Pen auto injector IM if previously prescribed x 1.
- If no response, epinephrine may be repeated x 2 total, every 5-10 minutes, by **OLMC Order;**☎
- Call for ALS assistance, but **do not delay transport**.

Severe Signs and Symptoms:

- Urticaria/rash and/or exposure to known allergen
- Stridor
- Oropharyngeal swelling/difficulty swallowing/throat tightening
- Severe dyspnea,
- Wheezing with accessory muscle use
- Poor air-movement
- Hypotension +/- signs of shock

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Notify and transport to most appropriate facility per preferential transport guidelines.

ADVANCED TREATMENT:

- Begin continuous EtCO2-monitoring if respiratory distress is present;
- Begin advanced airway management, as appropriate;
- If not already given, Administer epinephrine as above;
  May repeat x2 every 5-10 minutes, if no response, by **OLMC Order;**☎
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Initiate IV/IO fluid bolus of 20 ml/kg for hypotension, and may repeat x2;
- Administer diphenhydramine - 1mg/kg IV/IO/IM (max 50mg);
- If wheezing/bronchospasm is present:
  Consider 0.5% albuterol-2.5mg with 0.02% ipratropium bromide in 3cc 0.9% sodium chloride (NS) nebulized;
  May repeat 0.5% albuterol-2.5 mg in 3cc 0.9% sodium chloride (NS) every 5-15 minutes as needed for a total of 3-additional doses;
- Consider methylprednisolone - 2mg/kg IV/IO (max 60mg);

If signs of anaphylaxis/anaphylactic shock are present (stridor and/or hypotension):

Do not delay treatment with IV Epinephrine as follows:

Administer 1:10,000 epinephrine - 0.5mg (5cc) in 1000cc 0.9% NS IV/IO and infuse at 0.1-1mcg/minute.

Alternatively, 0.5mg (0.5cc) of 1:1000 epinephrine in 1000cc NS IV/IO at 0.1-1mcg/minute may also be used instead.

Titrate to effect by increasing/ decreasing infusion rate by 0.1cc/min (0.1mcg/ minute), every 1-minute. (see chart)

Quality Control Points		
Epinephrine IM	Epinephrine IV	Methylprednisolone

ALTERED MENTAL STATUS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Assist ventilations as appropriate;
- Follow other protocols as appropriate:
  Diabetic Emergencies
  Seizures/status epilepticus
  Trauma
- Obtain a thorough history of events leading up to the altered mental status;
- Check blood glucose concentration and if ≤ 60mg/dl:
  Administer glucose 15 G buccal if conscious or age appropriate and able to tolerate.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Transport and provide radio notification to most appropriate facility per preferential transport guidelines.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Initiate cardiac monitoring;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open;
- If blood glucose concentration still ≤ 60mg/dl:
  Consider dextrose D25W 2-4cc/kg IV/IO.
  If IV access cannot be obtained consider glucagon 0.1mg/kg (max 1mg) IM/IN.

Consider special circumstances below and treat as noted:

- If narcotic overdose is suspected:
  Administer naloxone 0.1 mg/kg (maximum single dose 2mg) IV/IO/IN
- If signs of shock refer to shock protocol.
- If patient exhibits signs of organophosphate poisoning (SLUDGEM);
  Consider atropine 0.02 mg/kg IV repeat until drying of secretions by **OLMC Order.** ☎
- If patient is suspected of TCA overdose:
  Consider 8.4% sodium bicarbonate 1mEq/kg IV, by **OLMC Order.** ☎
- If beta-blocker overdose is suspected:
  Consider glucagon 0.07mg/kg max dose 5 mg, by **OLMC Order.** ☎
- If calcium channel blocker overdose is suspected:
  Consider calcium chloride-20mg/kg(0.2ml/kg) slow push IV/IO, by **OLMC Order.** ☎
- If dystonic reactions is suspected:
  Consider diphenhydramine 1mg/kg IV/IO/IM (max 50mg) by **OLMC Order.** ☎

Quality Control Points
Antidotes

ASTHMA/WHEEZING

INDICATIONS:

- Exacerbation of previously diagnosed asthma:
  - Characterized by some combination of
  - Wheezing
  - Tachypnea
  - Accessory muscle use/retractions
  - Inability to speak in full sentences
- Wheezing due to suspected asthma (≥ 1-year of age).

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing.

BASIC TREATMENT:

- **Not indicated for wheezing associated with acute pulmonary edema;**
- Administer 0.5% albuterol - 2.5mg in 3cc 0.9% sodium chloride (NS) nebulized;
- If clinical picture worsens or if initial presentation of impending respiratory failure, follow protocol for Respiratory distress/failure and DAI:
- Call for ALS assistance, but **do not delay transport .**

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

If patient presents with severe symptoms/signs, e.g. receiving medications as treatment
Transport and provide radio notification to most appropriate facility of your impending arrival.

ADVANCED TREATMENT:

- Begin EtCO2-monitoring for moderate to severe respiratory distress;
- Administer 0.5% albuterol-2.5mg with 0.02% ipratropium bromide-0.5mg in 3cc 0.9% sodium chloride (NS) nebulized:
  May repeat 0.5% albuterol-2.5 mg in 3cc 0.9% sodium chloride (NS) every 5-15 minutes as needed for a total of 3-additional doses;
- If severe respiratory distress:
  Consider CPAP, as per CPAP procedure:
  - If signs of impending respiratory failure prior to or following initiation of CPAP, proceed to assisted ventilation with BVM;
  - Discontinue CPAP if the patient becomes hypotensive.
- Initiate advanced airway management, as appropriate;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open;
- Initiate cardiac monitoring.
- If **severe respiratory distress**:
  Consider methylprednisolone - 2mg/kg IV/IO, especially for subacute presentation(> 1-2 days), by **OLMC Order.** ☎
  If either unable to cooperate with or otherwise tolerate nebulizer therapy or if impending respiratory failure
  Administer 1:1000 epinephrine-0.15mg IM:
  - May repeat x 1 in 5-minutes, by **OLMC Order.**☎

  Consider magnesium sulfate - 25-50mg/kg IV/IO (max 2gm) in 50cc D5W over 10-15 minutes, by **OLMC Order.**☎
- If impending respiratory failure, initiate advanced airway management see protocol for respiratory distress/failure and DAI.

Quality Control Points		
CPAP	Magnesium Sulfate	Methylprednisolone

CARBON MONOXIDE EXPOSURE

GENERAL TREATMENT:

- Administer high flow oxygen:
  Assist ventilation, if appropriate;
- Follow other protocols as appropriate e.g.:
  Altered mental status
  Asthma/Wheezing
  Respiratory Distress or Failure
- Begin SpCO monitoring;
- Call for ALS assistance, but **do not delay transport.**

Special considerations:

Oxygen saturation (SPO2) may be a poor indicator of severity in CO poisoning.

Regardless of SpCO readings, always treat the condition of your patient.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Consider hospital with hyperbaric oxygen capabilities if patient is unconscious.

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- Initiate cardiac monitoring:
  Treat cardiac dysrhythmias;
- Establish IV/IO access of 0.9% sodium chloride (NS) as appropriate.

CROUP

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
  Consider humidified oxygen or nebulized saline for mild symptom/ signs
- Remove any tight clothing;
- Allow patient to remain in a position of comfort with someone familiar;
- Request ALS if severe, but **do not delay transport.**

Keep patient calm and in position of comfort

- The condition of an upset patient (e.g. crying, screaming) can deteriorate quicker than that of a calm patient.
- Family should be used to sooth child and keep them calm if possible.
- Do not force child into a position, they will protect their airway by their position.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

If patient presents with severe symptoms/signs, e.g. receiving medications as treatment
Transport and provide radio notification to most appropriate facility of your impending arrival.

ADVANCED TREATMENT:

- Initiate cardiac monitoring;
- If severe respiratory distress:
  Consider nebulized epinephrine:
  1:1000 3 mg(3cc) mixed with 3mL 0.9% sodium chloride (NS) via inhalation.

CROUP SCALE

The modified westley clinical scoring system for croup

Inspiratory Stridor		**Air entry**	
Not Present	0 Points	Normal	0 Points
When agitated/active	1 Point	Mildly decreased	1 Point
At rest	2 Points	Severely decreased	2 Points
Intercostal retractions		**Cyanosis**	
Mild	1 Point	None	0 Points
Moderate	2 Points	With agitation/activity	4 Points
Severe	3 Points	At rest	5 Points
		Level of consciousness	
		Normal	0 Points
		Altered	5 Points

Possible score 0-17

< 4 = Mild Croup 4-6 = Moderate Croup >6 = Severe Croup

Quality Control Points
Epinephrine IM

DIABETIC EMERGENCIES

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
- Determine blood glucose concentration;
- If patient is clinically or relatively hypoglycemic and conscious or age appropriate such that aspiration from oral intake is not a concern:
  Administer oral glucose 15 grams Bucal.
- If appropriate request ALS assistance, but **do not delay transport.**

ADVANCED TREATMENT:

Hyperglycemia:

- Establish IV access with 0.9% sodium chloride (NS):
  Consider 250mL – 500mL bolus to patients with severe hyperglycemia as appropriate to respiratory status (any signs/symptoms of pulmonary edema).

Hypoglycemia:

- Use D5W for IV access;
- If blood glucose concentration still ≤ 60mg/dl:
  Consider dextrose D25W 2-4cc/kg IV/IO.
  If IV access cannot be obtained consider glucagon 0.1mg/kg (max 1mg) IM/IN.

NAUSEA/VOMITING

GENERAL TREATMENT:

- Follow general guidelines for patient care, as appropriate;
  Gently position patient to facilitate airway (e.g., lateral decubitus position);
  Suction as necessary.

ADVANCED TREATMENT:

- Establish access with 0.9% sodium chloride (NS) to Keep Vein Open:
  If symptoms or signs of volume depletion (e.g., orthostatic, dry mucosae), consider administration of IV fluid bolus-20ml/kg, may repeat twice;
- Consider possible causes and follow other protocols, as appropriate, e.g.:
  Trauma
  Altered Mental Status
- May also be used in conjunction with any protocol where morphine sulfate is administered for pain, but it is not well-tolerated secondary to its GI effects.
- For severe nausea/vomiting:
  Administer ondansetron-0.1 mg/kg (max dose 4mg) IV/IM May repeat x 1 in 10-minutes, all by **OLMC Order.** ☎

Quality Control Points
Ondansetron

NEWBORN RESUSCITATION

GENERAL TREATMENT:

- Once the body is fully delivered, dry the baby and wrap it in a thermal blanket or dry towel. Cover the baby's scalp;
- Assess breathing:
  - If breathing is inadequate, stimulate the infant by gently rubbing the back and flicking the soles of the feet;
  - If breathing is still inadequate, begin assisted ventilation with a BVM at a rate of 40 to 60 breaths per minute;
  - If breathing is adequate, but infant displays central cyanosis, administer high flow O_2 via blow-by;
- Assess heart rate by auscultation or by palpation of the umbilical cord stump and if less than 60:
  - Assist ventilations;
  - Begin chest compressions at a rate of 120 (three compressions to each ventilation);
- Request ALS, but **do not delay transport;**
- Reassess patient frequently in route.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Transport and provide radio notification to receiving hospital of your impending arrival.

ADVANCED TREATMENT:

- If meconium is present, initiate endotracheal intubation before the infant takes its first breath:
  - Suction the airway using a meconium aspirator while withdrawing the tube;
  - Repeat the procedure until the tube is clear of meconium;
  - If the infant's heart rate slows, immediately discontinue suctioning and ventilate the infant;
  - If the infant is already breathing, intubation and suctioning may be omitted.
- Assess heart rate and, if less than 60, follow steps above;
- If heart rate is still less than 60 after 30 seconds of compressions:
  - Consider endotracheal intubation;
  - Obtain vascular access;
  - Consider epinephrine 0.01 mg/kg (0.1mL/kg of 1:10,000 concentration) IV/IO, may repeat every 3-5 minutes.

RESPIRATORY DISTRESS or FAILURE

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
- Follow other protocols, as appropriate, e.g.:

Non-traumatic cardiac arrest
Asthma/Croup
Carbon monoxide poisoning
Altered mental status
Shock/hypotension
Allergic reaction/anaphylaxis.

For severe respiratory distress;
Consider CPAP as per protocols for Asthma/ Wheezing or Near Drowning.

BASIC TREATMENT:

- If signs of upper airway obstruction, attempt to clear airway by:
  Opening or positioning;
  Use of NPA or OPA;
  Foreign-body removal, as appropriate:
  Heimlich maneuver, chest thrusts, visualization/McGill forceps;
- For severe respiratory insufficiency/impending respiratory failure:
  Assist Ventilations with BVM;
- Consider use of blind-insertion supraglottic airway (King, or other if available) for cardiac arrest (see protocol).

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Notify receiving facility of impending arrival for room preparation and hospital respiratory notifications.

ADVANCED TREATMENT:

- Consider underlying causes and follow other protocols, as appropriate (see above);
- For impending respiratory failure or anticipated loss of airway control, consider advanced airway management:
  Pre-oxygenate with 100% via appropriate delivery device prior to;
- **OROTRACHEAL INTUBATION INDICATORS:**
  Patient is unconscious; No gag reflex is present;
  Patient is apneic or has inadequate respirations;
  High risk of aspiration due to vomitus/hemorrhage;
  Unable to adequately oxygenate via BVM.
- Utilize adjuncts to facilitate orotracheal intubation, as follows:
  Maintain oxygen-2LPM by nasal cannula throughout procedure;
  Utilize suction, as necessary;
  Utilize cricoid pressure/Sellick's maneuver or BURP procedure, as needed.

Quality Control Points
Intubation

SEIZURES/STATUS EPILEPTICUS

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- Position patient to avoid injury and/or aspiration:
  Consider gently placing in lateral decubitus position;
- Check blood glucose concentration and follow Altered mental status protocol, as appropriate;
- Follow other protocols as appropriate:
  Trauma
- If ongoing seizures or status epilepticus (≥ 2 without an intervening lucid period):
  Call for Advanced Life Support assistance, but **do not delay transport**.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Notify receiving facility of impending arrival for room preparation and hospital respiratory notifications.

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- Begin cardiac monitoring:
  Acquire 12-lead EKG, if appropriate;
- If actively seizing or in status epilepticus, administer:
  Midazolam-0.15mg/kg IV/IO/IM/IN (single max dose 2mg)
  May repeat x1 in 5-10 minutes by **OLMC Order.** ☎
  Or, Only if midazolam is not available:
  Lorazepam-0.1mg/kg IV/IO (single max dose 2mg)
  May repeat 0.05 mg/kg x 1 in 10-15 minutes by **OLMC Order.** ☎
- Monitor carefully for respiratory depression and need for assisted ventilation following treatment with either agent;
- If patient is post-ictal and not actively seizing, pharmacologic therapy with either agent is not indicated;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open;
- If febrile seizure is suspected:
  Obtain temperature, if possible;
  Remove excess clothing and blankets.

Quality Control Points
Midazolam

SHOCK/HYPOTENSION

INDICATIONS:

- Tachycardia
- Diminished or absent peripheral pulses
- Decreased LOC
- Cap refill >2 sec
- Hypotension (late finding)

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- If trauma, follow protocol and control external hemorrhage, as appropriate;
- Place patient in a supine position as appropriate and as tolerated;
- Follow other protocols as appropriate:
  Allergic reaction/anaphylaxis
  Altered Mental Status
  Trauma
- Call for ALS assistance if available, but **do not delay transport**.

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- Initiate cardiac monitoring, treat cardiac dysrhythmias, and acquire and transmit 12-lead EKG;
  (as per ALS procedure for 12-lead EKG)
- Perform needle thoracentesis if suspected tension pneumothorax;
- Establish IV/IO access with 0.9% sodium chloride (NS):
  Consider administration of fluid bolus: 0.9% NS 20 mL/kg, as appropriate and may repeat twice.
  Consider additional fluid boluses, by **OLMC Order.** ☎

Quality Control Points
Needle Thoracentesis

TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE

INDICATIONS:

- Exposure to toxic substances from:
  - Ingestion
  - Inhalation
  - Injection
  - Skin absorption
- Intentional/accidental exposure to pharmacological substances.

The primary goal of physical assessment of the poisoned patient is to identify effects on the three vital organ systems most likely to produce immediate morbidity and/or mortality:

- Respiratory system
- Cardiovascular system
- Central nervous system

In the pediatric patient, this could result from the ingestion of just one pill.

GENERAL TREATMENT:

- Administer oxygen:
  - Titrate to oxygen saturation ≥ 95% and work of breathing;
  - Assist Ventilations, if indicated;
- Use patient and/or bystanders statements and answers to determine substance(s) involved;
- If poisoning or toxic exposure:
  - Remove patient from toxic environment as quickly as possible, remove clothing and decontaminate;
    - This should be performed by trained personnel with the appropriate PPE.
- Determine Blood Glucose concentration;
- Follow other protocols, as appropriate e.g.:

Bradydysrhythmias Diabetic Emergencies Hyperthermia/Hypothermia
Tachydysrhythmias

- Call for ALS assistance, if indicated, but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate advanced airway management, as appropriate;
- Begin cardiac monitoring:
  - Evaluate rhythm for width, regularity and rate;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  - Follow protocol for shock/hypotension, if appropriate;
- If symptoms/signs of cardiac or respiratory compromise, hemodynamic instability, or altered mental status consider the following:

Consider special circumstances below and treat as noted:

- If narcotic overdose is suspected:
  - Administer naloxone 0.1 mg/kg (maximum single dose 2mg) IV/IO/IN
- If signs of shock refer to shock protocol.
- If patient exhibits signs of organophosphate poisoning (SLUDGEM);
  - Consider atropine 0.02 mg/kg IV repeat until drying of secretions by **OLMC Order.** ☎
- If patient is suspected of TCA overdose:
  - Consider 8.4% sodium bicarbonate 1mEq/kg IV, by **OLMC Order.** ☎
- If beta-blocker overdose is suspected:
  - Consider glucagon 0.07mg/kg max dose 5 mg, by **OLMC Order.** ☎
- If calcium channel blocker overdose is suspected:
  - Consider calcium chloride-20mg/kg(0.2ml/kg) slow push IV/IO, by **OLMC Order.** ☎
- If dystonic reactions is suspected:
  - Consider diphenhydramine 1mg/kg IV/IO/IM (max 50mg) by **OLMC Order.** ☎

Quality Control Points
Antidotes

LOUISVILLE METRO EMS PROTOCOLS

PEDIATRIC ENVIRONMENTAL EMERGENCIES

BACK NEXT

HYPERTHERMIA

INDICATIONS:

- Elevated body temperature related to heat exposure;
- Altered mental status related to heat exposure.

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
- Move patient to a cool place away from any external heat source if possible;
- If appropriate request ALS assistance but **do not delay transport.**

Mild symptoms (heat cramps, heat exhaustion) No signs of altered mental status (body temperature <104):

- Help facilitate passive cooling:
  Loosen clothing, remove excessive clothing;
- If available administer PO fluids:
  Use caution if patient presents with nausea and vomiting.

Severe symptoms (heat stroke): Signs of altered mental status (body temperature 104-105)
Patient may or may not still be sweating

- Begin active cooling:
  Use sheets or towels dipped in ice water on exposed skin;
  Place ice packs behind neck, in axillae, and groin areas;
  If shivering starts, temperature drops <102, or Altered mental status improves Stop Active cooling.
- Determine Blood Glucose concentration.

ADVANCED TREATMENT:

- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open:
  Consider administration of fluid bolus: 0.9% NS 20 mL/kg, as appropriate and may repeat twice.
- If uncontrolled shivering occurs during cooling:
  Midazolam-0.1mg/kg IV/IM/IN (single max dose 1mg)
  Or, Only if midazolam is not available:
  Lorazepam-0.1mg/kg IV/IO (single max dose 1mg)

Quality Control Points
Midazolam

HYPOTHERMIA

INDICATIONS:

- Decreased body temperature related to cold exposure:
- Altered Mental Status related to cold exposure.

GENERAL TREATMENT:

Patients found in cardiac arrest secondary to hypothermia, should be re-warmed prior to determination of death

- Administer oxygen:
  Titrate to saturation ≥ 95% and work of breathing;
- Decrease on-going heat loss ASAP:
  Move the patient to a warm area (if possible);
  Dry and insulate the patient;
- Handle the patient gently, allowing no patient exertion;
  (rough handling of severely hypothermic patients may cause V-fib)
- Remove all wet clothing (CUT OFF to decrease patient movement);
- Apply "passive external rewarming" with blankets and the warm ambulance;
- Conscious patients should avoid heated oral fluids.
- If severe hypothermia suspected:
  Assess respirations and pulse carefully (up to 1 minute) as both may be very slow but still adequate for patient's slow metabolism;
  Provide expeditious, non-emergency transport.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Initiate cardiac monitoring:
  Acquire 12-lead EKG as per ALS 12-lead EKG procedure;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open;
- Follow other protocols as appropriate:
  Diabetic Emergencies
  Toxidrome/Poisoning/Substance Abuse/Overdoses

In severe Hypothermia:

- If ventricular fibrillation is present, administer one defibrillatory shock at 4j/kg;
  Specific Drug Administration directions, by **OLMC Order.**☎

NEAR DROWNING

GENERAL TREATMENT:

- Administer oxygen:
  - Titrate to oxygen saturation ≥ 95% and work of breathing;
  - Assist ventilations as appropriate;
- Immobilize the cervical spine if indicated by the mechanism of injury (see c-spine clearance procedure);
- Assess respiratory function:
  - Pay close attention to work of breathing and breath sounds;
- If hypothermia is suspected:
  - Remove wet clothing and dry patient;
  - Follow hypothermia protocol;

Call for ALS assistance if appropriate, but **do not delay transport**.

ADVANCED TREATMENT:

- Begin continuous EtCO2 monitoring if respiratory distress is present;
- Initiate CPAP, as appropriate:
  - If signs of impending respiratory failure prior to or following initiation of CPAP, proceed to assisted ventilation with BVM;
  - Discontinue CPAP if the patient becomes hypotensive;
- Initiate advanced airway management, as appropriate;
- Initiate cardiac monitoring and treat cardiac dysrhythmias;
- Establish IV/IO access with 0.9% sodium chloride (NS) to keep vein open.

Quality Control Points
CPAP

REPTILE ENVENOMATION

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95% and work of breathing;
- Remove all jewelry on affected limb:
  Immobilize below the level of the heart;
- Do not use constricting bands or tourniquets;
- If stinger is present attempt to brush away with edge of card (e.g. driver's license, credit card):
  Do not pinch or attempt to pull it out;
- Do not disturb wound site.
- Follow other protocols as appropriate e.g.:
  Bradydysrhythmias
  Tachydysrhythmias
  Diabetic emergencies
  Hyperthermia/hypothermia
  Shock/hypotension

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Consider other advanced treatment as appropriate:
  Initiate cardiac monitoring and treat cardiac dysrhythmias;
  IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open.

LOUISVILLE METRO EMS PROTOCOLS

PEDIATRIC TRAUMA

BACK NEXT

TRAUMA

GENERAL TREATMENT:

- Ensure airway while protecting the cervical spine;
- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- Treat Injuries/Control bleeding as needed (see injury matrix below for reference);
- Determine the need for C-spine Immobilization as indicated in the c-spine clearance procedure;
- Assess for hemodynamic instability, follow Shock protocol if appropriate;
- Call for ALS assistance, if needed, but do not delay transport:
  Refer to general guidelines for Level 1 trauma center transport indications.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate;
- Initiate cardiac monitoring;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open;
- Consider fluid resuscitation only if there are signs of decompensation and unable to palpate radial pulses (SBP 80-90):
  Establish with large bore catheter and consider second access site if indicated by symptoms/signs;
- **Do not Delay Transport** for IV access;
- As noted in injury matrix below, consider chest decompression if indicated;
- Consider pain management, if appropriate.

Head/Neck Injures

- Follow C-spine Clearance procedure to determine need of C-spine immobilization

Chest Injures

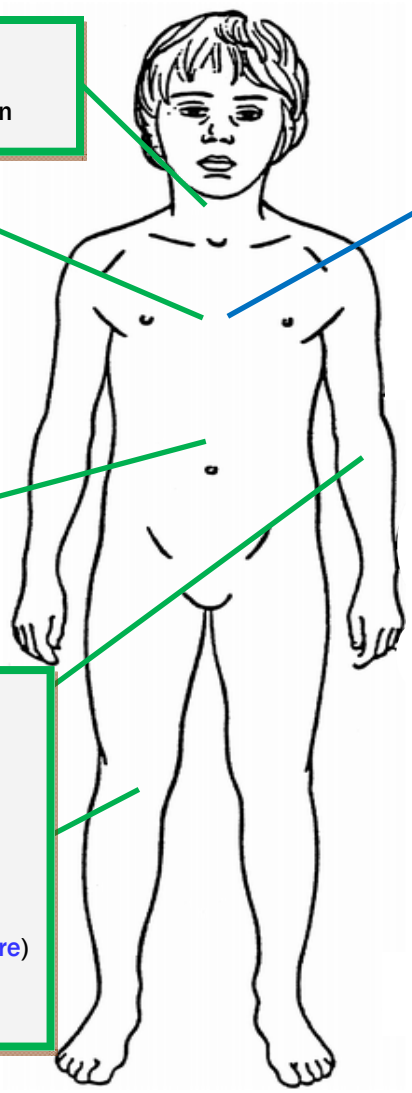
- Control bleeding
- Stabilize impaled objects
- Stabilize flail segments
- Cover open chest wounds with sterile occlusive dressing

Abdominal Injuries

- Control bleeding
- Stabilize impaled objects.
- Cover eviscerations with saline-moistened gauze.

Extremity Injuries

- Splint according to injury
  (e.g. traction splint for femur fracture)
  Splint in a neutral position.
- Apply sterile dressings to open fractures.
  Do not push exposed bone “back in”
- Control bleeding with direct pressure
  Utilize tourniquet device if bleeding is not controlled (see tourniquet procedure)
- Do not attempt to reduce dislocations in the field.



Chest Injures

- If open chest wound
  Observe closely for signs of developing tension pneumothorax
- If a tension Pneumothorax is suspected, perform chest decompression on the affected side per the needle thoracentesis procedure.

AMPUTATED BODY PART CARE

GENERAL TREATMENT:

- Administer oxygen:
  Titrate to oxygen saturation ≥ 95%, and to work of breathing;
- Control bleeding with direct pressure and elevation if possible;
- Cover the stump with a saline-soaked sterile dressing:
  Then wrap with a dry dressing;
- Wrap the severed part in a saline-moistened sterile dressing:
  Place in a watertight plastic bag;
  Place the bag in a cooler with ice (if possible;
  Do not freeze;
  Do not macerate (soak in water).
- Follow other protocols as appropriate:
  Trauma
- Call for ALS assistance, if needed, but **do not delay transport.**

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Provide notification and transport to most appropriate facility per the preferential transport guidelines

ADVANCED TREATMENT:

- Assess for hemodynamic instability;
- Establish IV/IO access with 0.9% sodium chloride (NS) to Keep Vein Open, if appropriate;
- If isolated injury consider pain management, see pain management protocol.

BURNS

GENERAL TREATMENT:

- Administer oxygen:
  - Titrate to oxygen saturation ≥ 95% and work of breathing;
  - Assist ventilation as appropriate;
- Stop the burning process:
  - Remove dry chemicals, flush affected area with copious amounts of water;
  - Remove contaminated patient clothing;
  - Remove clothing and jewelry in the area of the burn and distal to the injured area;
  - For chemical burns of the eye, flush eyes with copious amounts of normal saline or water;
  - Attempt to cool affected area;
- Determine blood glucose concentration;
- Monitor SpCO levels;
- Estimate TBSA affected and depth of burns (i.e. superficial, partial thickness);
- Apply dressings to burns as tolerated:
  - In burns under 10% TBSA use moist dressings.
  - In burns over 10% TBSA apply a dry burn sheet or dry sterile dressing and insulate the patient over this dressing to help prevent hypothermia.
- Request ALS for serious burns or electrical burns, but **do not delay transport.**

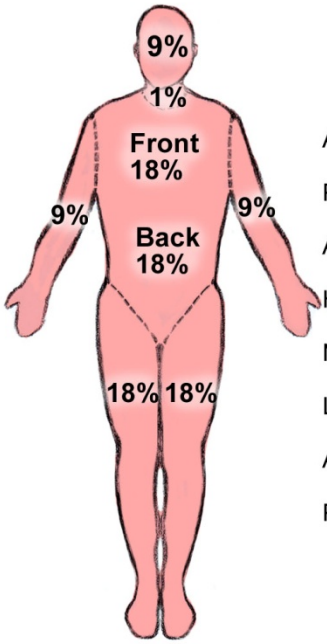
HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

If patient presents with severe symptoms/signs, e.g. burns over 10% respiratory involvement or circumferential burns Transport and provide radio notification to most appropriate facility of your impending arrival.

ADVANCED TREATMENT:

- Begin advanced airway management, as appropriate:
  - Observe for signs of inhalation injury (e.g. stridor, muffled voice, singed facial/nasal hairs, carbonaceous sputum);
  - If signs of inhalation injury are present, be prepared to secure the airway;
- Establish large bore IV access x 2 with 0.9% sodium chloride (NS) and follow guidelines below:
  - Fluid to be administered = 4cc x patient's weight x %TBSA, with half of fluids being administered in the first 8 hours after time of injury;
  - IVs may be inserted through the burn area if necessary;
- Initiate cardiac monitoring and obtain 12 lead EKG, especially when the injury involves an electrical burn;
  - Treat cardiac dysrhythmias according to specific protocol;
- Consider pain management, see pain management protocol.

Child body Part	% of total BSA
Arm	9%
Head and neck	18%
Leg	14%
Anterior trunk	18%
Posterior trunk	18%



Adult body Part	% of total BSA
Arm	9%
Head	9%
Neck	1%
Leg	18%
Anterior trunk	18%
Posterior trunk	18%

PAIN MANAGEMENT

INDICATIONS:

- For moderate-to-severe pain (> 6/10) on the Pain Scale (see below), associated with:
  - ⇒ Burns (in the absence of suspected or potential airway or other respiratory compromise)
  - ⇒ Isolated extremity Injury
  - ⇒ Other pain syndromes, e.g.
    - Abdominal pain
    - Sickle cell crisis

Contraindications:

- SBP < 100; oxygen saturation < 95%.
- This protocol does not apply if pain associated with suspected:
  - Head trauma
  - Cervical spine injury
  - Altered mental status, e.g., overdose or intoxication.

GENERAL TREATMENT:

- Administer oxygen:
  - Titrate to oxygen-saturation ≥ 95% and work of breathing;
- Place patient in position of comfort and splint any injured extremities, as appropriate;
- Follow applicable protocols, e.g.:
  - Trauma
  - Burns
- Assess pain using Pain Scale for arrival of ALS on-scene;
- Call for Advanced Life Support assistance, but **do not delay transport.**

ADVANCED TREATMENT:

- Initiate cardiac monitoring;
- Establish IV access with 0.9% sodium chloride (NS) to Keep Vein Open:
  - Administer fluid bolus-20ml/kg IV as appropriate, e.g.:
    - Burns
    - Hypotension (if multi-trauma and no palpable radial pulse (SBP<80-90)
    - Sickle cell crisis
- Apply continuous EtCO2;
- Administer morphine sulfate - 0.1mg/kg IV/IO/IM may repeat every 5-minutes to maximum of 10mg, by **OLMC Order;** ☎
- Titrate to pain relief (document Pain Scale) and respiratory/hemodynamic status (SBP >90, O2-saturations ≥ 95%, et-CO2 <40);
- If respiratory depression occurs following morphine administration:
  - Assist ventilations and administer naloxone-0.4mg-2mg. IV/IO/IN, titrated to respiratory status;
- Monitor and document vital signs and assess Pain Scale following each dose of morphine administered;
- For associated nausea and/or vomiting administer ondansetron, as per pediatric nausea and vomiting protocol.

Quality Control Points	
Morphine	Ondansetron

LOUISVILLE METRO EMS PROTOCOLS

BACK NEXT

12-LEAD ELECTROCARDIOGRAM PROCEDURE

General Indications:

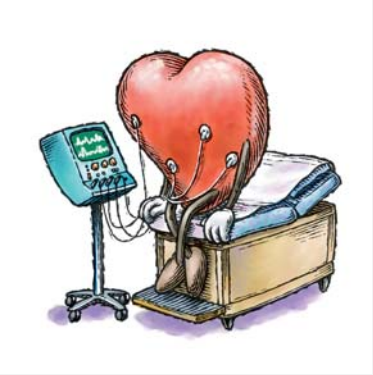
- Patients who are complaining of chest pain and/or anginal equivalents consistent with ACS, palpitations, irregular heart beat, shortness of breath, dizziness, syncope, or weakness believed to be of cardiac origin should be considered;

Additional Advanced Indications:

- Electrical Injuries;
- Suspected cardiotoxic overdose.

General Treatment:

- Assess patient and monitor cardiac status;
- If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG;
- In General, 12- Lead should be obtained in the first 10 minutes of the patient encounter prior to moving patient to ambulance, unless unstable;
- Prepare ECG monitor and connect patient cable with electrodes;
- Enter the required patient information into the 12 Lead device;
- Expose chest and prep as necessary. Modesty for the patient should be respected;
- Apply chest leads and extremity leads in the following landmarks:
  - RA –Right Arm;
  - LA – Left Arm;
  - RL – Right Leg;
  - LL – Left Leg;
  - V1 – 4th intercostal space at right sternal border;
  - V2 – 4th intercostal space at left sternal border;
  - V3 – Directly between V2 and V4;
  - V4 – 5th intercostal space at midclavicular line;
  - V5 – Level with V4 at left anterior axillary line;
  - V6 – Level with V5 at left midaxillary line;



- Instruct patient to remain still;
- Acquire the 12 Lead ECG:
  - Entering the patient's age and sex when prompted;

Basic Treatment:

- If EKG has either of the flowing descriptive statements—***Meets ST elevation MI Criteria*** or Left Bundle-Branch Blocks (LBBB) transmit and transport to STEMI facility.
- Contact the receiving hospital to notify them that a 12 Lead ECG has been sent;
  - Read the descriptive statement to the hospital if they did not receive the transmission.
- Download data to E-PCR;
- Document procedure, time, and results on E-PCR.

Advanced Treatment:

- For patients with cardiac complaint, keep all leads connected at all times practical to allow automatic ST – segment monitoring to proceed;
- If 12 Lead indicates STEMI transport to STEMI facility and transmit the ECG to the receiving hospital;
- Contact the receiving hospital to notify them that a 12 Lead ECG has been sent;
- If inferior wall involvement STEMI, consider right sided 12-lead;
  - Placement for right sided 12-lead:
    - V4 – 5th intercostal space at midclavicular line on right chest wall;
    - V5 – Level with V4 at right anterior axillary line;

CARDIAC - AUTOMATED EXTERNAL DEFIBRILLATION

Clinical Indications:

- Patients in cardiac arrest (pulseless not breathing).

GENERAL TREATMENT:

- Ensure that chest compression are adequate and interrupted only when absolutely necessary;
- **If arrest was witnessed by EMS or Fire:**
  Immediately apply AED, follow prompts, analyze, and shock as indicated.
- **If arrest was not witnessed by EMS or Fire:**
  Perform 5-cycles (or approximately 2-minutes) of CPR before analyzing.
- Remove any medication patches on the chest and wipe off any residue;
- Apply defibrillation/pacing pads to chest as indicated on package;
- Press the Analyze button (button will illuminate) to activate AED mode. The monitor will begin to analyze the rhythm;
- Stop CPR and clear the patient during analysis:
  Keep CPR Interruption as brief as possible;
- If shock advised, assure to Clear the patient then press and Hold the Shock Button (RED CIRCLE) to defibrillate;
- Immediately resume chest compression and ventilation;
- After two minutes the monitor will again prompt analyzing now:
  Stop CPR and clear the patient during analysis, defibrillate if indicated;
- If “no shock advised” resume CPR immediately until next analyze phase;
- Keep interruption of compressions as brief as possible.

CARDIAC - CARDIOVERSION

Clinical Indications:

- Unstable Patients with tachydysrhythmia (narrow or wide):
  See Tachydysrhythmia or Pediatric tachydysrhythmia protocols;
- Patient is not pulseless (the pulseless patient requires defibrillation).

ADVANCED TREATMENT:

- Attach standard four-lead monitor;
- Apply defibrillation/pacing pads to chest as indicated on package;
- Consider the use of pain or sedating medications per pain management or tachydysrhythmia protocols;
- Press the button marked sync (the light on button the will illuminate);
- Adjust energy with the up and down arrows on the energy select button to select correct energy level:
  see tachydydysrythmias/pediatric tachydysrythmias protocol;
- Charge the monitor to desired energy level by depressing the yellow charge button;
- Make certain all personnel are clear of patient;
- Press and Hold the Shock Button (RED CIRCLE) to cardiovert;
  Note: It may take the monitor/defibrillator several cardiac cycles to "synchronize" and deliver energy. There may be some delay between activating the cardioversion (depressing the shock button) and the actual delivery of energy.
- Check patient response and perform immediate defibrillation if the patient's rhythm deteriorates into a "shockable" pulseless rhythm. See defibrillation procedure;
- Repeat steps using escalating energy as provided in appropriate protocols, if the patient's condition is unchanged.

CARDIAC - MANUAL DEFIBRILLATION

Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia.

ADVANCED TREATMENT:

- Ensure that chest compression are adequate and interrupted only when absolutely necessary;
- Apply defibrillation/pacing pads to chest as indicated on package;
- Set the desired energy level using the up and down arrows on the energy select button per cardiac arrest protocol;
- Charge the monitor to desired energy level by depressing the yellow charge button:
  Continue compression while the defibrillator is charging;
- Make certain all personnel are clear of patient;
- Press and Hold the Shock Button to defibrillate;
- Immediate resume chest compression and ventilation for 2 minutes:
  Then stop compressions to visually analyze rhythm and check for a pulse only if appropriate for rhythm;
- Select the next recommended energy level and shock again follow the 2 minute cycles;
- Keep interruption of compressions as brief as possible.

CARDIAC - PACING

Clinical Indications:

- Patients with symptomatic bradycardia:
  - Heart rate < 60 BPM
  - Relative bradycardia
- Signs of inadequate cerebral/cardiac perfusion:
  - Ischemic Chest Pain
  - Hypotension
  - Pulmonary Edema

ADVANCED TREATMENT:

- Attach standard four-lead monitor;
- Apply defibrillation/pacing pads to chest as indicated on package;
- Press the button marked pacer (the light on the button will illuminate);
- Adjust heart rate to 80 bpm using the up and down arrows on the rate button for adult:
  - see pediatric bradyrhythmias chart for pediatric rate;
- Note pacer spikes on EKG;
- Slowly increase mA output using the up and down arrows on the current button until capture;
- If unable to capture at maximum current, stop pacing immediately;
- If capture observed on monitor:
  - Check for corresponding pulses and vital signs;
- Consider the use of sedation or analgesia if patient is uncomfortable (see bradyrhythmias protocol)
- If no hemodynamic response increase the paced rate to 100/minutes using 10 bpm increments;

CAPNOGRAPHY PROCEDURE

Clinical Indications:

- EtCO2 is to be used to assist with verification of supraglottic and endotracheal tube placement;
- EtCO2 is to be used for all intubations;
- EtCO2 is to be used with all benzodiazepine or narcotic administration
- EtCO2 is to be used to monitor a patient in respiratory distress:
  - Side Stream Monitoring
  - Main Stream Monitoring

Precautions / Notes:

- Do not remove from packaging until ready for use Interpretation should be done after 40 seconds of ventilation and full expiration;
- Do not use with humidified oxygen;
- Use does not replace the need to auscultate breath sounds on patients;
  - Cannot differentiate intubation of the right mainstem bronchus;
- Emesis and medications can undermine reliability of detector if humidified particles clog the tube.

Notes:

- Any loss of CO2 detection or waveform indicates an airway problem and should be assessed and documented.
- Document the procedure and download the results in the ePCR.
- The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.

Critical Comment:

- When CO2 is **NOT** detected, three factors must be quickly assessed:

⇒ **Loss of airway** - apnea? esophageal endotracheal tube placement/migration? obstruction?

⇒ **Circulatory collapse** - cardiac arrest? massive pulmonary embolism? exsanguination?

⇒ **Equipment failure** - disconnected or malfunctioning bag-valve or ventilator?

Main Stream Monitoring Procedure:

- Connect the EtCO2 device to the machine. Take 30 seconds for calibration to get ready;
- Post Intubation, check breath sounds;
- The in-line adapter goes between the endotracheal tube and the bag valve mask;
- Ventilate the patient via bag valve mask;
- Expelled EtCO2 will be depicted by a wave form on the screen;
- Expelled EtCO2 will also produce a Capnogram numeric value in mm/Hg;
- In all patients with a pulse, an EtCO2 >20 is anticipated;
- In the post resuscitation patient, no effort should be made to lower ETCO2 by modification of ventilator rate:
  - Further, in post resuscitation patients without evidence of ongoing, severe bronchospasm, ventilatory rate should never be < 6 breaths per minute;
- In the pulseless patient, EtCO2 waveform with a EtCO2 >10 may be utilized to confirm the adequacy of an airway to include BVM and advanced devices when SpO2 will not register.

Side Stream Monitoring Procedure:

Connect EtCO2 device to machine;
Apply EtCO2 nasal cannula;
Oxygen can be delivered to the patient through the nasal cannula device or a non re-breather mask.

CHILD BIRTH - FIELD DELIVERY PROCEDURE

GENERAL TREATMENT:

- Determine need for imminent delivery or need for immediate transport;
- Position mother for delivery:
  Have mother lie back, if tolerated, with knees drawn up and spread apart;
  Elevate buttocks with pillow or blankets;
- Whenever possible, use sterile or aseptic technique;
- Coach mother to breathe deeply between contractions and to **push with** contractions;
- Administer oxygen using appropriate oxygen delivery device, as indicated per protocol.

Delivery Procedure

- As the head crowns control with gentle pressure and support the head during delivery;
- Examine neck for the presence of a looped (nuchal) umbilical cord:
  If cord is looped around neck, gently slip it over the infant's head. If unable to do so, clamp and cut the cord;
- Support the infant's head as it rotates for shoulder presentation:
  With gentle pressure, guide the infant's head downward to deliver the anterior shoulder and then upward to release the posterior shoulder;
- Complete the delivery of the infant;
- Apply two clamps to umbilical cord (if not already done due to Nuchal cord):
  The first one is placed approximately ten (10) inches from the infant;
  The second is placed 2"-3" proximal to the first clamp (7"-8" from infant's abdomen);
  Cut cord between clamps and check for umbilical cord bleeding;
- Umbilical tape may used if umbilical vascular access is being considered (umbilical vein catheterization procedure);
- If umbilical cord bleeding is evident apply additional clamp(s) as needed;
- Dry infant and wrap in warm towels/blanket (cover infant's head):
  Place infant on mother's abdomen for mother to hold and support;
- Note and record infant's gender, time and geographical location (especially if in transit) of birth:
  If infant resuscitation **is not** necessary, record **APGAR** score at 1 minute and 5 minutes post delivery;
  If infant resuscitation is necessary, **follow** neonatal resuscitation protocol**;**

Delivery of the Placenta: (**do not delay transport**)

- As the placenta delivers, the mother should be encouraged to push with contractions;
- Hold placenta with both hands, place in plastic bag or other container and transport with mother to receiving hospital. **NEVER** "pull on" umbilical cord to assist placenta delivery.

APGAR SCORING SYSTEM

	0 Points	1 Point	2 Points	Points totaled
Activity (muscle tone)	Absent	Arms and legs flexed	Active movement	
Pulse	Absent	Below 100 bpm	Over 100 bpm	
Grimace (reflex irritability)	Flaccid	Some flexion of Extremities	Active motion (sneeze, cough, pull away)	
Appearance (skin color)	Blue, pale	Body pink, Extremities blue	Completely pink	
Respiration	Absent	Slow, irregular	Vigorous cry	

Severely depressed	0-3
Moderately depressed	4-6
Excellent condition	7-10

CPAP PROCEDURE

Indications:

- Severe respiratory distress, due to suspected:
  - Pulmonary edema
  - COPD
  - Asthma
  - Near Drowning
  - Pneumonia
- Awake and cooperative;
- Effective mask seal can be obtained;
- Two or more of the following signs must be present:
  - Respiratory Rate >24;
  - Increased work of breathing;
  - Intercostal retractions/accessory muscle use;
  - SpO2 <92%.

Contraindications:

- Suspected pneumothorax;
- Inability to maintain own airway:
  - Vomiting;
  - Upper GI Bleeding;
- Impending respiratory failure that may require assisted ventilation;
- Facial abnormalities that prevent effective mask seal (burns, trauma, congenital defects);
- Hypotension (SBP <90), or relative hypotension with signs of decompensation.

HOSPITAL NOTIFICATION / DESTINATION CONSIDERATIONS:

Provide prehospital notification and request respiratory therapy to respond to ED.

CPAP device can be maintained at ED on wall O2 at 15L/min.

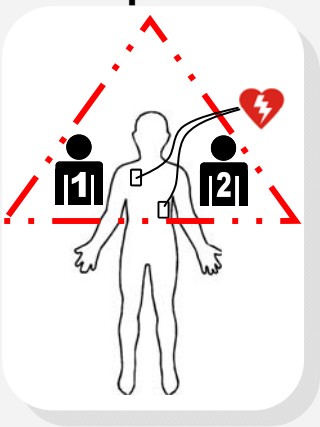
Advanced Treatment:

- Assess patient and initiate treatment as per relevant protocols for:
  - Pulmonary edema/congestive heart failure
  - Asthma/reactive airway disease
  - Chronic obstructive pulmonary disease/emphysema
- Monitor pulse oximetry and continuous $EtCO_2$ prior to and following application of CPAP (see capnography procedure);
- If intubation becomes necessary, appropriate $EtCO_2$ device must be applied to ET tube;
- Continue nebulized bronchodilator therapy, as appropriate;
- Continue administration of SL NTG as appropriate;
- Increase positive airway pressure from 5cmH_2O until improvement in O_2 saturation, $EtCO_2$ and symptomology is seen;
- Vitals should be assessed at least every 5 minutes;
- **Advanced airway interventions (BVM ventilations and/or intubation) should be considered in the patient that does not improve after 3-5 minutes of therapy at 10cmH2O, or in any patient who demonstrates signs of impending respiratory failure.**

Quality Control Points
CPAP

CPR - PIT CREW APPROACH PROCEDURE

2 Responders



Position 1 (Compressor)
Right side

- Upon arrival at patient side, responder will immediately assess level of consciousness and presence of carotid pulse. (No more than 3 - 5 seconds for assessment)
- If no pulse is detected, immediately begin chest compressions for a 60 second cycle of 100 compressions

Position 2 (Compressor)
Left side

- Upon arrival at patient side, responder will attach AED/LP15 pads to patient, power on monitor and initiate appropriate metronome for resuscitation scenario
  - AED/LP15 will remain within arm's reach of Position 2 at all times
- Assist position 3 airway by providing BVM ventilations
- Prepare to relieve Position 1 as compressor

Compression notes:

While preparing to resume compressions, responder shall have hands "hovering" near patient's chest in the ready position so as to minimize time off of chest.

There should be no delays in chest compressions while charging defibrillator.

Position 1 Notes:

Position 1 should secure airway when appropriate if only 2 responders are on scene. The compression cycle should not be interrupted to perform these airway procedures.

Defibrillation notes:

If arrest was witnessed by EMS or Fire Immediately apply AED, follow prompts, analyze, and shock as indicated.

If arrest was not witnessed by EMS or Fire perform approximately 2-minutes of CPR **before analyzing.**

Airway notes:

Endotracheal intubation should be deferred until 6 minutes of CPR with or without 3 completed defibrillatory shocks have been completed, as long as BVM ventilations are adequate and airway compromise is not suspected as cause of cardiac arrest.

Advanced airway management should be limited to 1-attempt.

Once advanced or supraglottic airway has been placed and confirmed, position 1 and 2 will alternate ventilations.

After a 60 second cycle of 100 compressions, Position 2 takes over as primary compressor and Position 1 prepares to oxygenate patient.

Position 1 (Compressor right side)

- Insert orophayngeal airway into patient
- Place NRB mask onto patient at a rate of 15L/min
- Prepare to resume compressions from position 2

Position 2 (Compressor left side)

- After completing 60 second cycle of 100 compressions, responder will immediately "ANALYZE" cardiac rhythm.
  - ◊ (BLS) Allow AED to analyze cardiac rhythm
  - ◊ (ALS) Rhythm interpretation should last no longer than 3 seconds

If cardiac rhythm analysis shows "No shock advised" (BLS) – Asystole/PEA (ALS)
Position 1 immediately begins 60 second cycle of 100 compressions

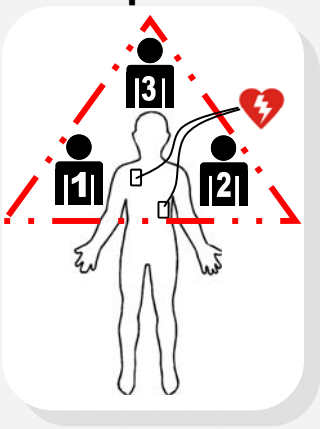
If cardiac rhythm analysis shows "Shock advised" (BLS) – V-fib/V-tach (ALS)
Position 1 immediately begins chest compressions while Position 2 readies defibrillator, quickly clears responders from patient, and delivers energy as appropriate. After defibrillation is administered, Position 1 continues the 60 second cycle of 100 compressions.

Scenario is repeated with each responder performing a 60 seconds cycle of 100 chest compressions and analyzing every 2 minutes as indicated.

****After 6 minutes of CPR and 3 analyzations of AED, an advanced or supraglottic airway may be inserted****

CPR - PIT CREW APPROACH PROCEDURE

3 Responders



Position 1 (Compressor) Right side

- Upon arrival at patient side, responder will immediately assess level of consciousness and presence of carotid pulse. (No more than 3 - 5 seconds for assessment)
- If no pulse is detected, immediately begin chest compressions for a 60 second cycle of 100 compressions

Position 2 (Compressor) Left side

- Upon arrival at patient side, responder will attach AED/LP15 pads to patient, power on monitor and initiate appropriate metronome for resuscitation scenario
  - AED/LP15 will remain within arm's reach of Position 2 at all times
- Assist position 3 airway by providing BVM ventilations
- Prepare to relieve Position 1 as compressor

Position 3 (Airway) Head

- Immediately open the airway using appropriate technique for scenario
  - Head-Tilt Jaw-Lift when cervical spine trauma is not suspected
  - Modified Jaw Thrust when cervical spine trauma is suspected
- Verify lack of spontaneous respirations
- Insert oropharyngeal airway, attach supplemental oxygen and appropriate attachments to BVM.
  - BLS responders - Attach ResQPod to BVM and follow light prompt for ventilation
  - ALS responders - Attach end tidal CO2 (EtCO2) filterline to BVM, attach ResQPod to EtCO2 and follow light prompt for ventilation
- Maintain airway and mask seal with two hands (2 "E-C" method)
  - Responders in compressor position that are not currently compressing will squeeze the BVM when appropriate to ventilate the patient.

Position 3 Notes:

Position 3 should secure airway when appropriate if only 3 responders are on scene.

Compression notes:

While preparing to resume compressions, responder shall have hands "hovering" near patient's chest in the ready position so as to minimize time off of chest.

There should be no delays in chest compressions while charging defibrillator.

Defibrillation notes:

If arrest was witnessed by EMS or Fire Immediately apply AED, follow prompts, analyze, and shock as indicated.

If arrest was not witnessed by EMS or Fire perform approximately 2-minutes) of CPR **before analyzing.**

Airway notes:

Endotracheal intubation should be deferred until 6 minutes of CPR with or without 3 completed defibrillatory shocks have been completed, as long as BVM ventilations are adequate and airway compromise is not suspected as cause of cardiac arrest.

Advanced airway management should be limited to 1-attempt.

Once advanced or supraglottic airway has been placed and confirmed, position 3 will ventilate.

After a 60 second cycle of 100 compressions, Position 2 takes over as primary compressor and Position 1 prepares to oxygenate patient.

Position 1 (Compressor right side)

- Assist position 3 airway by providing BVM ventilations
- Prepare to resume compressions from position 2

Position 2 (Compressor left side)

- After completing 60 second cycle of 100 compressions, responder will immediately "ANALYZE" cardiac rhythm.
  - ◊ (BLS) Allow AED to analyze cardiac rhythm
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If cardiac rhythm analysis shows "No shock advised" (BLS) – Asystole/PEA (ALS)
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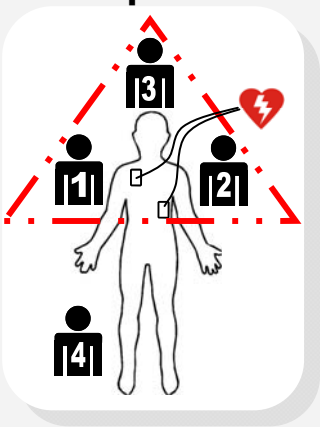
If cardiac rhythm analysis shows "Shock advised" (BLS) – V-fib/V-tach (ALS)
Position 1 immediately begins chest compressions while Position 2 readies defibrillator, quickly clears responders from patient, and delivers energy as appropriate. After defibrillation is administered, Position 1 continues the 60 second cycle of 100 compressions.

Scenario is repeated with each responder performing a 60 seconds cycle of 100 chest compressions and analyzing every 2 minutes as indicated.

****After 6 minutes of CPR and 3 analyzations of AED, an advanced or supraglottic airway may be inserted****

CPR - PIT CREW APPROACH PROCEDURE

4 Responders



Position 1 (Compressor) Right side

- Upon arrival at patient side, responder will immediately assess level of consciousness and presence of carotid pulse. (No more than 3 - 5 seconds for assessment)
- If no pulse is detected, immediately begin chest compressions for a 60 second cycle of 100 compressions

Position 2 (Compressor) Left side

- Upon arrival at patient side, responder will attach AED/LP15 pads to patient, power on monitor and initiate appropriate metronome for resuscitation scenario
  - AED/LP15 will remain within arm's reach of Position 2 at all times
- Assist position 3 airway by providing BVM ventilations
- Prepare to relieve Position 1 as compressor

Position 3 (Airway) Head

- Immediately open the airway using appropriate technique for scenario
  - Head-Tilt Jaw-Lift when cervical spine trauma is not suspected
  - Modified Jaw Thrust when cervical spine trauma is suspected
- Verify lack of spontaneous respirations
- Insert oropharyngeal airway, attach supplemental oxygen and appropriate attachments to BVM.
  - BLS responders - Attach ResQPod to BVM and follow light prompt for ventilation
  - ALS responders - Attach end tidal CO2 (EtCO2) filterline to BVM, attach ResQPod to EtCO2 and follow light prompt for ventilation
- Maintain airway and mask seal with two hands (2 "E-C" method)
  - Responders in compressor position that are not currently compressing will squeeze the BVM when appropriate to ventilate the patient.

Position 4 (Interventionist)

- Instruct and assist position 3 with BVM attachments and initiating EtCO2 (ALS)
- Instruct and assist position 2 with LP15 switching from AED mode (ALS)
- Establish IV/IO access
  - Administer medications appropriate to cardiac rhythm and scenario (ALS)
- Acts as "code commander"
  - Ensures proper rate depth and quality of compressions and appropriately times cycles between the compressors
  - Ensure airway technique in use is adequate and effective.

Position 4 Notes:

If position 4 is BLS personnel, they should still be interventionist, secure supraglottic airway and act as code commander.

Compression notes:

While preparing to resume compressions, responder shall have hands "hovering" near patient's chest in the ready position so as to minimize time off of chest.

There should be no delays in chest compressions while charging defibrillator.

Defibrillation notes:

If arrest was witnessed by EMS or Fire Immediately apply AED, follow prompts, analyze, and shock as indicated.

If arrest was not witnessed by EMS or Fire perform approximately 2-minutes) of CPR **before analyzing.**

Airway notes:

Endotracheal intubation should be deferred until 6 minutes of CPR with or without 3 completed defibrillatory shocks have been completed, as long as BVM ventilations are adequate and airway compromise is not suspected as cause of cardiac arrest.

Advanced airway management should be limited to 1-attempt.

Once advanced or supraglottic airway has been placed and confirmed, position 3 will ventilate.

After a 60 second cycle of 100 compressions, Position 2 takes over as primary compressor and Position 1 prepares to oxygenate patient.

Position 1 (Compressor right side)

- Assist position 3 airway by providing BVM ventilations
- Prepare to resume compressions from position 2

Position 2 (Compressor left side)

- After completing 60 second cycle of 100 compressions, responder will immediately "ANALYZE" cardiac rhythm.
  - ◊ (BLS) Allow AED to analyze cardiac rhythm
  - ◊ (ALS) Rhythm interpretation should last no longer than 3 seconds

If cardiac rhythm analysis shows "No shock advised" (BLS) – Asystole/PEA (ALS)
Position 1 immediately begins 60 second cycle of 100 compressions

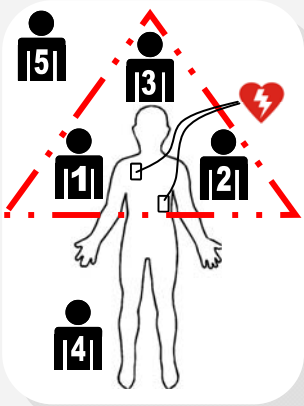
If cardiac rhythm analysis shows "Shock advised" (BLS) – V-fib/V-tach (ALS)
Position 1 immediately begins chest compressions while Position 2 readies defibrillator, quickly clears responders from patient, and delivers energy as appropriate. After defibrillation is administered, Position 1 continues the 60 second cycle of 100 compressions.

Scenario is repeated with each responder performing a 60 seconds cycle of 100 chest compressions and analyzing every 2 minutes as indicated.

****After 6 minutes of CPR and 3 analyzations of AED, an advanced or supraglottic airway may be inserted****

CPR - PIT CREW APPROACH PROCEDURE

5 Responders



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Position 5 (Logistics)

- Positioned outside the circle of care
- Responsible for gathering pertinent patient history, keeps the family informed and prepares them for transition to cessation or transport
- Functions as logistics officer for resuscitation crew, gathering equipment relaying information by radio
- Assists code commander in ensuring appropriate timing for procedures and compressor switching.

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C-SPINE CLEARANCE

C-Spine clearance is intended for use on patients presenting with head/neck trauma, that would normally be automatically immobilized. This is to be used as a tool to rule out, spinal immobilization in those cases, if indicated.

High-risk contraindications

- *The answer to **all** of these must be **no** in order to withhold immobilization;*
- *If the answer is **yes** to any **one** of these, the patient **must be immobilized**.*

		Age:
☐ Yes	☐ No	< 12 and > 65-years old
		High-index of suspicion:
☐ Yes	☐ No	High-risk mechanism of injury
☐ Yes	☐ No	Fall From elevation > or = 3 feet / 5 stairs
☐ Yes	☐ No	Axial load to head, e.g. diving
☐ Yes	☐ No	MVC high speed, rollover or ejection
☐ Yes	☐ No	Motorized recreational vehicles e.g. ATV, Motorcycles
☐ Yes	☐ No	Bicycle/MVC
		Cognition and communication:
☐ Yes	☐ No	Alert and oriented < 3
☐ Yes	☐ No	GCS < 15
		Altered Mental Status:
☐ Yes	☐ No	Intoxication/poisoning (e.g. ETOH, CO)
☐ Yes	☐ No	Metabolic abnormality (e.g. hypoglycemia, hyperglycemia)
☐ Yes	☐ No	Infection (e.g. meningitis, encephalitis)
☐ Yes	☐ No	Head trauma
☐ Yes	☐ No	Structural abnormality (e.g. brain tumor)
☐ Yes	☐ No	Environmental (e.g. hypothermia, hyperthermia)
		Cognitive limitations:
☐ Yes	☐ No	Mental retardation
☐ Yes	☐ No	Lack of decisional capacity
☐ Yes	☐ No	Psychiatric illness that impairs decisional capacity
☐ Yes	☐ No	Dementia that impairs decisional capacity
		Limitations to communication:
☐ Yes	☐ No	Language barrier
☐ Yes	☐ No	CVA (e.g. aphasia, dysarthria)
☐ Yes	☐ No	Facial trauma
		Symptoms or signs:
☐ Yes	☐ No	Significant distracting injury
☐ Yes	☐ No	Complaints of neck pain without range of motion;
☐ Yes	☐ No	Midline tenderness, step-off, swelling on exam or palpation of the C-spine
☐ Yes	☐ No	Extremity neurologic deficits
☐ Yes	☐ No	Weakness (cannot move all 4 extremities symmetrically)
☐ Yes	☐ No	Sensory loss (to soft & sharp touch)
☐ Yes	☐ No	Paresthesias (numbness or tingling)
		Complaints of pain or paresthesias with:
☐ Yes	☐ No	Passive rotation of neck 45% in either direction (look over each shoulder)
☐ Yes	☐ No	Flexion and extension of the neck (touch chin to chest and then look up)

NO = No need for spinal Immobilization

YES = Immobilize the Patient

Quality Control Points
C-Spine Clearance

GEB - BOUGIE STICK PROCEDURE

The bougie, often called a gum elastic bougie (GEB), is a long, flexible stylet which is introduced through the glottic opening before the ETT, whether visualization of the vocal cords can be achieved or not. The distal end is curved upward, and there are markings at 10 cm intervals to measure ETT insertion depth. This shape and size of the GEB are designed to be easier to place in the trachea than the ETT when faced with a difficult airway. The following guideline is meant to facilitate the use of this highly efficient and easy-to-use difficult airway tool.

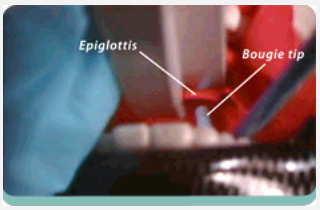
Indications:

- Unsuccessful intubation attempts
- Predicted difficult intubation

Contraindications:

- Age less than eight (8)
- ETT size less than 6.5 mm

Advanced Treatment:



- Select proper ETT without stylet, and prepare suction;
- Lubricate the distal end and cuff of the ETT and the distal ½ of the bougie;
  (note: Failure to lubricate the Bougie and the ETT may result in failure)
- Visualize the vocal cords using laryngoscopy and introduce the bougie with curved tip anteriorly:
  The tip should be seen passing through the vocal cords if they can be visualized;
  If the cords cannot be visualized, insert tip just below the blade or epiglottis;
- Once inserted, gently advance the bougie until you meet resistance (“hold-up”) or movement of the tip on the tracheal rings (“washboard”);
- If resistance is not met and/or tracheal rings are not felt then a probable esophageal intubation has occurred and insertion should be attempted again;
- Once the tip has been properly placed, a second provider should be used to load the ETT and hold proximal control of the bougie to keep it in the trachea while the operator is still holding laryngoscopic pressure;
- Gently advance the bougie and loaded ETT until you feel hold-up or tracheal rings again, thereby assuring proper placement;
- While maintaining a firm grasp on the proximal bougie, slide the ETT over the bougie to the appropriate depth;
- If you are unable to advance the ETT into the trachea and the bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER-clockwise to turn the bevel of the ETT posteriorly;
- If this technique fails, direct laryngoscopy while advancing the ETT might be necessary (this will require an assistant to maintain the position of the bougie and advance the ETT);
- Once the ETT is correctly placed, hold it securely and remove the bougie;
- Confirm tracheal placement with all pertinent methods, secure tube, and reassess frequently.

Notes:

- The GEB can be used in conjunction with the KING LTD airway device. Gently insert the GEB into the KING LTD and the GEB will be directed into a specific hole positioning it into the trachea. Remove the KING LTD sliding it over the GEB and slide the proper sized ETT over the GEB into the trachea, using the same techniques as above.

IMPEDANCE THRESHOLD DEVICE PROCEDURE (Res-Q-Pod)

Clinical Indications:

- Impedance Threshold Devices improve cardiac pre-load in patients receiving CPR;
- Non-traumatic cardiac arrest patients receiving ventilations by:
  - Endotracheal tube
  - King-LTD airway
  - BVM (Must have at least one rescuer dedicated to maintaining mask-to-face seal)

Contraindications:

- Spontaneous respirations
- Known or suspected thoracic trauma

General Treatment:

- Ensure airway can be adequately maintained as determined by scope of practice and airway management protocol;
- The ITD shall be placed between the ETT/King-LTD and BVM **or** between the BVM and the face mask;
  - Note: For intubated patients, the ITD must be attached directly to the endotracheal tube or King-LTD. All other attachments (i.e., EtCO2) must be placed on top of the ITD.
- Activate the red switch so that the timing lights begin to flash;
- Deliver one breath with each flash of the timing light (once every six seconds);
- If there is return of spontaneous circulation (ROSC) and/or the patient has spontaneous respirations, remove the ITD.

INTRAOSSEOUS INFUSION - EZ/IO PROCEDURE

Clinical Indications:

- Route for intravenous fluids or medications where a peripheral IV cannot be established in 2 attempts or 90 seconds;
- Patient must exhibit 1 or more of the following:
  - ⇒ An altered mental status (GCS of 8 or less)
  - ⇒ Respiratory compromise (SpO2 80% after appropriate oxygen therapy)
  - ⇒ Respiratory rate < 10 or > 40 per minute)
  - ⇒ Hemodynamic instability (Systolic BP of < 90)
- EZ – IO® may be considered PRIOR to peripheral IV attempts in the following situations:
  - ⇒ Cardiac arrest (medical or trauma)
  - ⇒ Profound hypovolemia with alteration of mental status and GCS < 8

Contraindications:

- Fracture of the tibia or femur
- Previous orthopedic procedures (IO within 24 hours, Knee replacement)
- Pre-Existing medical condition (tumor near site or peripheral vascular disease).
- Infection at insertion site
- Inability to locate landmarks due to significant edema
- Excessive tissue at insertion site.

Sizing Preference:

PINK NEEDLE

- Pediatric Patients <8y and/or 40 Kg or less

BLUE NEEDLE

- Adult patients age ≥ 8 and/or 40 kg or greater

YELLOW NEEDLE

- Adult patients age ≥ 8 and/or 40 kg or greater who have excessive tissue over targeted insertion site

Advanced Treatment:

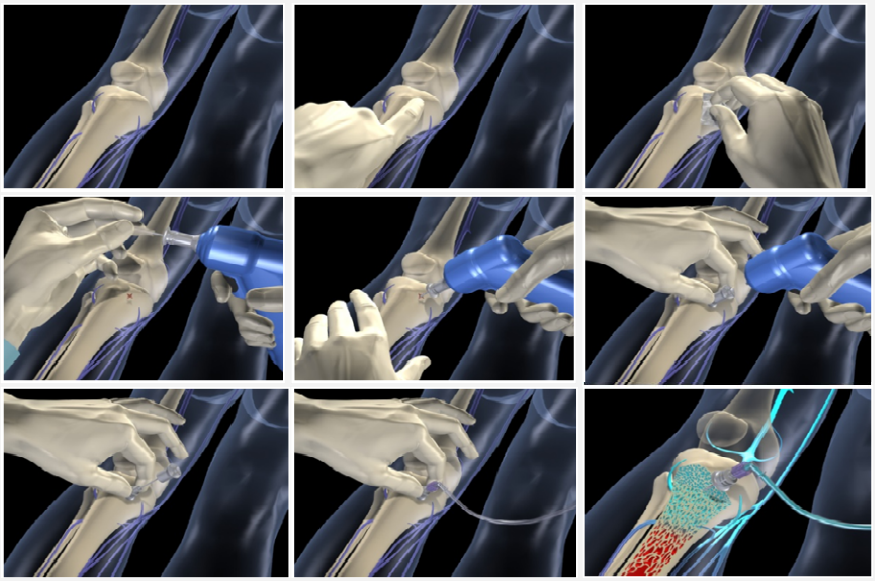
- Locate insertion site (see note above);
- Cleanse insertion site using aseptic technique;
- Stabilize leg and insert EZ-IO® needle set through the skin. This should be done at a 90° angle. Ensure that the 5mm mark is visible and you feel the bone. If so power the driver and place the needle set into the bone. Stop when the needle flange touches the skin:
  If the 5mm mark is not visible, you should abandon the procedure, consider an alternate site, or choose a larger needle set as the current needle set may not be long enough;
- Remove EZ-IO® driver from needle set while stabilizing catheter hub;
- Confirm proper placement and look for signs of infiltration:
  The IO catheter stands straight up at a 90° angle;
  Blood at the tip of the stylet;
  Aspiration of a small amount of bone marrow with a syringe;
  A free flow of drugs or fluids without difficulty or evidence of infiltration;
- Connect primed EZ-Connect®;
- Conscious patients should receive 1-2cc mg 2% lidocaine IO:
  Pediatric patients should receive .5mg/kg of 2% lidocaine (0.025ml/kg) IO;
- Flush or bolus the IO catheter with 10 ml of normal saline;
- Begin infusion;
- Monitor EZ-IO® site and patient condition.

Note:

- Gravity flow is often slow, consider a pressure cuff if medications and/or fluid boluses are needed;
- If there is swelling around the site due to fluids in the soft tissues, consider the following:
  The fluid may be leaking from a previous puncture site;
  It may be leaking through the hole around the needle which was enlarged by bumping or jiggling the needle;
  The needle may have gone all the way through the bone and fluid is leaking from the end of the needle on the other side. You must remove the needle and attempt access in another bone.

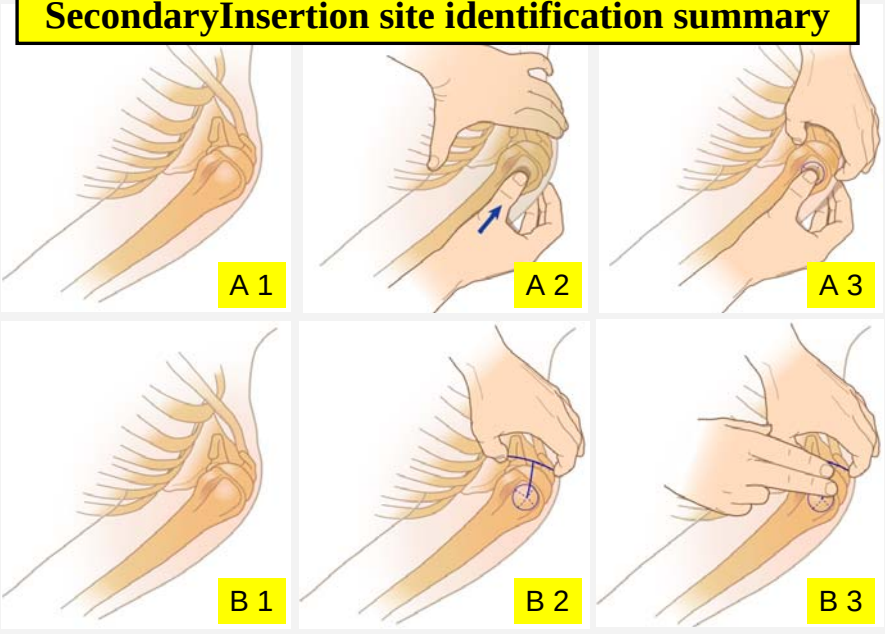
NEXT

INTRAOSSEOUS INFUSION - EZ/IO PROCEDURE



Preferred Site:

- The preferred site is the proximal tibia, one finger width (1-3 cm) below the promi-nence (tibial tuber-osi-ty) on the flat an-teromedial sur-face. The other tibia, either Humeral head or other distal tibia should be chosen if the pri-mary bone is frac-tured or the over-lying skin is burned or infected.



Secondary Site:

- The Proximal Humerus is a site that has been approved by the FDA and the manufacturer of the EZ-IO device. This site can be used as an alternative to tibia placement.

Third Site:

- The distal tibia is a site that has been approved by the FDA and the manufacturer of the EZ-IO device. This site can be used as an alternative to proximal tibia and proximal Humerus placement.

NEXT

PROCEDURES

INTRAOSSEOUS INFUSION - EZ/IO PROCEDURE

Secondary Site Procedure:

- Expose shoulder and adduct Humerus by placing patient in the supine position with arm against body and elbow resting on the ground and stretcher. The forearm should be resting on the abdomen;
- Palpate and identify the mid-shaft Humerus and continue palpating toward the proximal aspect or humeral head;
- With the opposite hand you may consider pinching the anterior and inferior aspects of the humeral head while confirming the identification of the greater tubercle;
- Confirm proper identification of the greater tubercle;
- Clean site with aseptic technique;
- Stabilize and insert the EZ-IO AD catheter at a 90 degree angle;
- Stabilize catheter and remove driver;
- Stabilize hub and remove stylet;
- Confirm placement and flush with 10 ml of saline;
- Secure needle.

Third Site Procedure:

- The distal tibia is a site that has been approved by the FDA and the manufacturer of the EZ-IO device: This site can be used as an alternative to proximal tibia and proximal Humerus placement;
- Expose the distal tibia;
- Place the ring finger on the medial malleolus and go two finger widths up for the adult patient: one finger width for the pediatric patient;
- Confirm proper identification of the distal tibia;
- Clean site with aseptic technique;
- Stabilize and insert the EZ-IO AD catheter at a 90 degree angle;
- Stabilize catheter and remove driver;
- Stabilize hub and remove stylet;
- Confirm placement and flush with 10 ml of saline;
- Secure needle.

KING AIRWAY PROCEDURE

Placement must be confirmed by auscultation, observation of chest rise, and detection of end-tidal CO2 if available. All confirmation methods must be documented. Failure to positively confirm effective ventilation shall result in immediate removal.

- **Indications for insertion:**
  Cardiac arrest in patients more than 4 feet in height.
- **Contraindications for insertion:**
  Patients with known esophageal disease;
  Patients who have ingested caustic substance(s).
- **Indications for removal:**
  Inability to ventilate;
  Return of spontaneous circulation with gag reflex.

ALS PROVIDERS can use as an option for initial airway, or after failed endo-tracheal intubation in unresponsive patients without gag reflex.

General Treatment:

- Ventilate patient with oral/nasal airways and BVM with 100% oxygen during preparation of King LT-D;
- Select appropriate size (see chart);
- Place patient's head in a neutral position. If trauma is suspected provide manual cervical spine motion restriction;
- Hold the King LT-D at the connector with the dominant hand;
- With the non-dominant hand, hold the mouth open and apply a chin lift;
- Using a lateral approach introduce the lubricated tip into the mouth;
- Advance the tip behind the base of the tongue while rotating tube back to the midline so that the blue orientation line faces the chin of the patient;
- Without exerting excessive force, advance the tube until base of the connector is aligned with teeth or gums;
- Inflate the King LT-D with the appropriate sized volume of air. See chart for correct amounts;
- Attach the manual resuscitator bag to the King LT-D;
- While bagging the patient gently withdraw the tube until ventilation becomes easy and free flowing;
- Adjust cuff inflation if necessary to maintain a seal of the airway at the peak ventilatory pressure employed;
- Confirm correct placement:
  Listen for breath sounds;
  Observing the chest rise and fall;
  Presence of EtC02.
- Secure the King LT-D with tube tie. Consider use of C-collar, head blocks and LSB to restrict head movement;
- Re-check position after each patient movement and on transfer of care to another provider.

INSERTION GUIDE

Patient Height	King Size	King Color	Cuff Volume
4 to 5 feet	3	Yellow	60 ml
5 to 6 feet	4	Red	80 ml
Over 6 feet	5	Purple	90 ml

Quality Control Points

Intubations

NEEDLE THORACENTESIS PROCEDURE

Clinical Indications:

- Treatment of tension pneumothorax is simple, but complications of the procedure can be lethal;
- Diagnosis must be accurate and is not always easy;
- Field relief of tension pneumothorax is indicated **ONLY** when the patient has progressive severe respiratory distress with:
  - Cyanosis
  - Decreased breath sounds on the affected side
  - Hypotension and/or
  - Subcutaneous emphysema
- In addition the patient may have distended neck veins and tracheal shift away from the affected side;
- If the patient is intubated, there should be increasing difficulty in ventilating;
- Hypotension can be detected by noting loss of radial pulse;
- Usually there will be loss of consciousness as well.

Contraindications:

- Hemorrhage from vessel laceration.
- Creation of a pneumothorax if one was not already present.
- Laceration of the lung.
- Infection.

Advanced Treatment:

- Maintain airway and administer oxygen by non-rebreather face mask or BVM as needed;
- Expose the entire chest;
- Clean the affected side;
- Prepare for the procedure using one of two techniques:
  1. Attach a 2" or longer 12—14 gauge IV catheter to a large syringe, or
  2. Use the large bore IV catheter alone
- Insert the 12—14 gauge IV catheter and needle assembly, over the top of the rib in the second or third intercostal space in the *midclavicular* line:
  Additional site is the 4th or 5th intercostal space *midaxillary* line;
- Pediatric cases calls for smaller IV catheter (18 or 20 Gauge);
- If a tension pneumothorax is present, then a rush of air will be heard or the plunger of the syringe will be easy to pull back;
- Remove the needle from the catheter and leave the plastic catheter in place.

Notes:

- Positive pressure ventilation may lead to the development of a pneumothorax and to rapid progression to tension pneumothorax;
- CPAP is contraindicated in suspected pneumothorax.

Quality Control Points
Needle Thoracentesis

PHYSICAL RESTRAINT PROCEDURE

- Personnel shall restrain combative or disoriented patients who present a physical danger to themselves or the crew. Mildly combative or disoriented patients may be restrained if there is a reason for concern that a worsening of the patient's condition many present a physical danger to self and others. Extremely violent patients may require the assistance of law enforcement to facilitate restraint. It is acceptable to assist law enforcement officers at their request.
- Restraints are to be used only when necessary in situations where the patient is violent or potentially violent and may be a danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of a medical condition.

Physical Restraint:

- Withdraw from the scene to a safe location immediately if the patient has any type of weapon or potential weapon and wait for Law Enforcement to secure the scene;
- First, try to verbally deescalate the situation;
- The patient may be restrained supine on a long spine board with backboard straps and head immobilization: The patient shall not be restrained in a prone position nor shall a backboard be placed on top of him/her;
- Stretcher Seat Belts are an appropriate means of securing / restraining a patient to the stretcher;
- Commercial soft restraints or cravats may be utilized to secure a patients arms and legs to the backboard or stretcher: Prior to and immediately following the application of a physical restraint an assessment of pulse, motor, and sensory of the distal limb that is restrained;
- The use of a spithood is appropriate when needed to protect crew members from infectious diseases and possible blood-bourne pathogens;
- **NOT AUTHORIZED**: Any use of any restraint not authorized by this policy is prohibited. Examples of unauthorized restraint types include: tape, rope, other binding materials or choke holds.

CAUTION: OVERSTEPPING THE BOUNDARIES OF RESTRAINT MAY BE PERCEIVED AS BATTERY, ASSAULT, CIVIL RIGHTS VIOLATION OR FALSE IMPRISONMENT.

KRS 503.110 Use of force by person with responsibility for care, discipline, or safety of others.

- The use of physical force by a defendant upon another person is justifiable when the defendant is a person responsible for the operation of or the maintenance of order in a vehicle or other carrier of passengers and the defendant believes that such force is necessary to prevent interference with its operation or to maintain order in the vehicle or other carrier, except that deadly physical force may be used only when the defendant believes it necessary to prevent death or serious physical injury.
- The use of physical force by a defendant upon another person is justifiable when the defendant is a doctor or other therapist or a person assisting him at his direction, and:
  - ⇒ The force is used for the purpose of administering a recognized form of treatment which the defendant believes to be adapted to promoting the physical or mental health of the patient; and
  - ⇒ The treatment is administered with the consent of the patient or, if the patient is a minor or a mentally disabled person, with the consent of the parent, guardian, or other person legally competent to consent in his behalf, or the treatment is administered in an emergency when the defendant believes that no one competent to consent can be consulted and that a reasonable person, wishing to safeguard the welfare of the patient, would consent.

Quality Control Points
Excited Delirium

QUICK TRACH II PROCEDURE

Clinical Indications:

- Acute upper airway obstruction, which cannot be relieved by, obstructed airway maneuvers;
- Upper airway trauma with inability to nasally or orally intubate a patient who has severe respiratory insufficiency.

Advanced Treatment:

- Place the patient in a supine position. Assure stable positioning of the neck and hyperextend the neck (unless cervical spine injury suspected);
- Secure the larynx laterally between the thumb and forefinger. Find the cricothyroid membrane (in the midline between the thyroid cartilage and the cricoid cartilage). **This is puncture site;**
- Prep the site by vigorously scrubbing with alcohol or iodine preps;
- Firmly hold device and puncture cricothyroid membrane at a 90-degree angle:
  - ⇒ After puncturing the cricothyroid membrane, check the entry of the needle into the trachea by aspirating air through the syringe;
  - ⇒ If air is present, needle is within trachea, change the angle of insertion to 60 degrees (from the head) and advance the device forward into the trachea to the level of the stopper. The stopper reduces the risk of inserting the needle too deeply and causing damage to the rear wall of the trachea;
  - ⇒ Should no aspiration of air be possible 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.

- Remove the stopper. After the stopper is removed, be careful not to advance the device further with the needle still attached;
- Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe;
- Secure the cannula with the neck strap;
- Apply the connecting tube to the 15 mm connection and connect the other end to the bag valve mask with supplemental oxygen;
- Continue ventilation with 100 percent oxygen and periodically assess the airway.

Complications:

- Perforations of the back wall of the trachea and the esophagus from excessively deep penetration by the QuickTrach. With stopper in place, this should be an extremely rare complication.
- Respiratory arrest and patient demise due to:
  - Severity of patient's airway injury;
  - Lack of attention to other potential airway maneuvers;
  - Subcutaneous air due to improper tube or catheter positioning, along with positive ventilation;
  - Bleeding from superficial neck vessels is very common. Use direct pressure after QuickTrach is in place.

Notes:

- Hold constant pressure on the larynx laterally between the thumb and forefinger. If you release this pressure during the procedure, landmarks may become difficult to relocate.

TOURNIQUET PROCEDURE: C-A-T (Combat Application Tourniquet)

Clinical Indications:

- A tourniquet will be applied to control potentially fatal hemorrhagic extremity wounds after other means of massive bleeding control have failed.

Indication for use of a tourniquet include, but are not limited to:

GSW; other penetrating trauma; shrapnel wounds; and an amputation that will lead to the death of the patient from catastrophic blood loss.

General Treatment:

- Attempt to control hemorrhage using direct pressure, prior to considering the application of a tourniquet:
  If unable to control the hemorrhage though the application of direct pressure, apply a C-A-T tourniquet as below.

1) Apply tourniquet proximal to the bleeding site. Route the band around the limb and pass the tip through the inside slit of the buckle. Pull the band tight.

2) Pass the tip through the outside slit of the buckle. The friction buckle will lock the band in place.

3) Pull the band very tight and securely fasten the band back on itself.

4) Twist the rod **until bright red bleeding has stopped and the distal pulse is eliminated.**

5) Place the rod inside the clip; lock ing it in place. **Check for bleeding and distal pulse.** If bleeding is not controlled, consider additional tightening or applying a second tourni quet proximal side by side to the first and reassess.

6) Secure the rod inside the clip with the strap. **Prepare the patient for transport and reassess.** Record the time of application.

Complications / Precautions:

- An incorrectly applied tourniquet can lead to increased hemorrhage and the death of the patient.
- Applying a tourniquet to an extremity can cause nerve and tissue damage whether applied correctly or not.
  Proper and accurate patient assessment and rapid transport are critical factors to consider in order to prevent long term disability.
- Tissue damage is unlikely if the tourniquet is removed within a short period of time.
  Low risk to tissue is acceptable over death secondary to hypovolemic shock.

UMBILICAL VEIN CATHETERIZATION PROCEDURE

Clinical Indications:

- Venous access for fluid and drug administration for a newborn (24 hours or less) that has arrested or has not responded to respiratory resuscitation.
- If unable to utilize EZ/IO due to complications or under weight

Equipment:

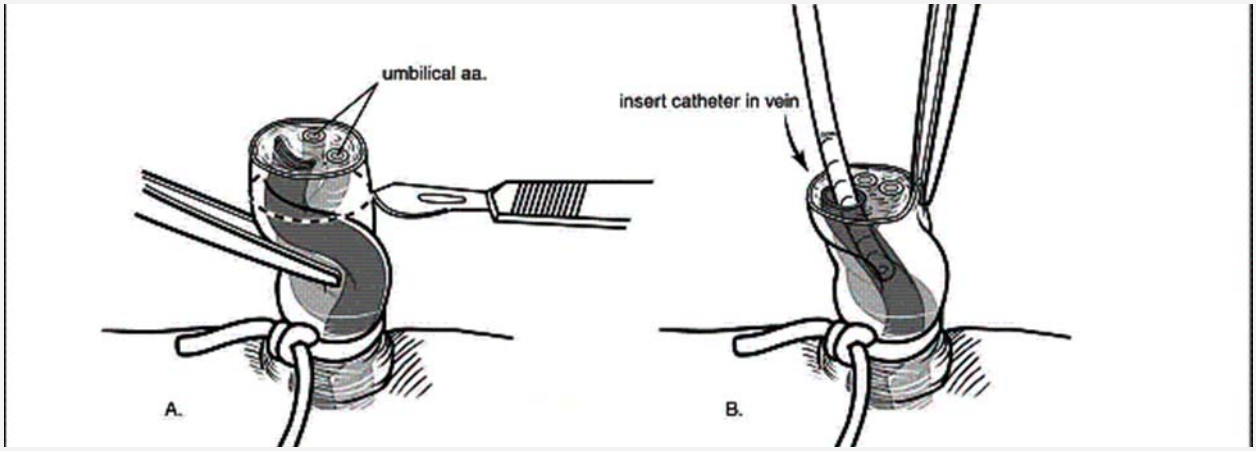
- Betadine
- Scalpel
- Package of umbilical tape or clamps
- 3-way stopcock
- Dressing
- 2 inch, 16ga, or 5F Umbilical Catheter (radiopaque)
- 10cc Syringe
- Tape
- Normal IV setup 10 or 15 gtts set

Advanced Treatment:

- Keep infant in a warm environment;
- Attach 3-way stopcock to catheter;
- Prep the umbilical cord and surrounding area with Betadine:
  Drape the area if possible while an assistant holds the clamped cord in a vertical orientation away from the abdominal wall;
- Transect the cord 2.5 cm (approximately 1 inch) from the abdominal wall using aseptic technique:
  Use umbilical tape to loosely wrap the cord prior to transection;
  The tape can be constricted accordingly to control bleeding and help secure the catheter;
- The umbilical vein is identified as the single thin-walled vessel:
  Umbilical arteries are paired, have thicker walls, and are usually constricted;
  Any vessel that continues to bleed is usually the vein;
- Insert the catheter 1-4 cm (approximately ½ -1½ inches) , so **the tip is just below the skin**, and only until good blood flow is obtained:
  Avoid placement of the catheter too deep;
  Further advancement may result in catheterization of the liver;
- Attempt to slowly withdraw blood from the site using a syringe to verify proper placement of the catheter:
  If unsuccessful, re-attempt insertion;
- Secure the catheter to the abdominal wall with tape;
- Attach IV tubing to the 3-way stopcock and run IV fluids 0.9% NaCl at 10cc/kg or per protocol.

Note:

- Dextrose administration through the catheter should not exceed a concentration of 10% 1g/kg
- Bicarb solution should be diluted 1:1, or a 4.2% should be used 1mEq/kg.



VASCULAR ACCESS DEVICE ACCESS PROCEDURE

Indications:

- Emergent venous access when patient's life is in imminent danger or patient is in cardiorespiratory arrest, and
- A peripheral IV cannot be established after two attempts (attempts can include actual venipunctures or looking at two different sites to find a vein), and
- Patient has central venous access device (CVAD) present (PICC Line, Port-a-Cath).

Contraindications:

- Suspected infection at site
- Suspected or known malfunction of site

Catheter types:

Open Ended Catheters (Triple Lumen, Broviac, Hickman): Are white in color. Tip of catheter is open and blood flows in when fluid is not infusing. Risk of air embolism and/or hemorrhage if catheter becomes disconnected. Requires Heparinization to minimize fibrin collection and clot formation and keep the catheter patent.

Closed Ended Catheters (Groshong®/PASV™): The Groshong line is very common in home health settings in the northstate. Tip of catheter is closed; no blood enters catheter in neutral state. Requires positive or negative pressure to open the valves. No risk of air embolism or hemorrhage if catheter becomes disconnected. Single and multiple lumens. Does not require Heparin flush to remain patent.

a. **PASV™** (White in color) has the valve located within the catheter hub. The valve remains closed when the catheter is not in use and when subjected to normal central venous pressures. When positive fluid pressure is applied through the luer lock hub, the valve opens, allowing infusion through the catheter. When negative pressure (aspiration) is applied, the valve also opens, allowing for withdrawal of blood into a syringe. This catheter has a polyester tissue ingrowth cuff inside the body, which supports ingrowth of tissue, prevents dislodgment, and provides a barrier to infection.

b. **Groshong®** (BLUE in color) has a closed terminal end. There is a slit on the body of the catheter that opens appropriately with positive and negative pressure applied from the external adapter end. This catheter has a Dacron cuff inside the body, which supports ingrowth of tissue, prevents dislodgment, and provides a barrier to infection.

Implanted Venous Access Devices (Port-a-Cath): Are long-term, surgically implanted infusion systems that contain a self-sealing injection port connected to a catheter, which is placed into the Subclavian Vein and terminates in the lower one-third of the SVC. The entire system is implanted. Nothing is exposed outside the body. The most common port site is at the clavicular area and the less common is a port implanted at the antecubital area. Ports can be placed in other body cavities, e.g., intraperitoneal, intrapleural, intraarterial, epidural. The following only addresses intravenous ports. Implanted ports can be valved or open-ended. This will influence flush protocols regarding the use of heparin. Requires special non-coring needle to access site. The bevel of the non-coring needle opens on the side. The needle's penetration of the septum is like that of a knife, so the septum closes cleanly when the needle is removed, preventing coring and leakage.

PICC Line: Long-term, long (20-28 inches) intravenous access device made of a soft flexible material, the PICC is a Central Catheter peripherally inserted into the lower Superior Vena Cava via the Anticubital, Basilic Vein or Cephalic Vein. The most appropriate location for the tip of the PICC is the lower one-third of the SVC, close to the junction of the SVC and the right atrium. This tip location allows the catheter to float freely within the vein lumen and lie parallel to the vessel wall, resulting in a considerable reduction in such complications as thrombosis and infection. A PICC may have an open internal end, which requires heparin flushes to minimize the fibrin collection and clot formation, or a valved tip, which only requires saline flushes. One valved catheter (PASV™) has the valve located within the catheter hub. The valve remains closed when the catheter is not in use and when it is subjected to normal central venous pressures. When positive fluid pressure is applied through the Luer lock hub, the valve opens, allowing infusion through the catheter. When negative pressure (aspiration) is applied, the valve also opens, allowing for withdrawal of blood into a syringe. The other valved catheter (Groshong®)6 has a closed terminal end. There is a slit on the body of the catheter that opens appropriately with positive and negative pressure applied from the external adapter end.

a. *Open Ended Catheters - L-caths, V-caths.*
b. *Closed Ended Catheter - Bard Groshong (Blue in color).*

NEXT

VASCULAR ACCESS DEVICE PROCEDURE

TREATMENT:

Procedure for peripherally inserted central catheter :

- Prepare equipment: 10 ml syringe (empty), 10 ml syringe (normal saline) and sterile gloves (if available);
- If more than one lumen is available (PICCs and Boviacs can have one, two, or three lumens), select the largest lumen available;
- Remove cap on the end of the catheter;
- Prep the end of the lumen with an alcohol swab;
- Using a 10 ml syringe, (after unclamping the lumen) aspirate 3-5 ml of blood with the syringe and discard. If unable to aspirate blood, re-clamp the lumen and attempt to use another lumen (if present). If clots are present, contact medical control before proceeding. Re-clamp the lumen;
- Flush the lumen with 3 – 5 ml normal saline using a 10 ml syringe. If catheter does not flush easily (note that a PICC line will generally flush more slowly and with greater resistance than a typical intravenous catheter), re-clamp the selected lumen and attempt to use another lumen (if present);
- Attach IV administration set and observe for free flow of fluid;
- If shock is not present, allow fluid to run at rate of 10 ml/hour to prevent the central line from clotting.

Note: The maximum flow rates for a PICC line is 125 ml/hour for less than 2.0 Fr. sized catheter and 250 ml/hour for catheters over 2.0 Fr. sized catheters.

Note: Avoid taking a blood pressure reading in the same arm as the PICC.

Procedure for implanted catheter (portacath, Pas Port, mediport):

- Prepare all necessary equipment: 10 ml syringe (empty), 10 ml syringe (normal saline) and sterile gloves (if available);
- Identify the access site; usually located in the chest:
  Clean the access site with Betadine; remove Betadine with alcohol swab;
- Insert Huber needle;
- Secure the access point firmly between two fingers and attach 10 ml syringe to Huber needle;
- Aspirate 3-5 ml of blood with the syringe. If unable to aspirate blood, do not attempt further use.
- Flush the catheter with 3 – 5 ml normal saline using a 10 ml syringe. If catheter does not flush easily, do not attempt further use;
- Attach IV administration set and observe for free flow of fluid;
- If shock is not present, allow fluid to run at rate of 10 ml/hour to prevent the central line from clotting.

LOUISVILLE METRO EMS PROTOCOLS

PHARMACOPEIA

BACK NEXT

Medication	Class
ADENOSINE	Endogenous Nucleotide

Indications

- Conversion of SVT to sinus rhythm.

Contraindications

- Second or third-degree block
- Wide complex irregular tachycardia
- Hypersensitivity to adenosine

Dosage and Administration

Protocol - TACHYDYSRYTHMIAS

- Advanced Treatment: (ALS) - For stable narrow complex regular SVT
  Dose - 12 mg IV/IO with 0.9% sodium chloride (NS) flush
  May repeat x 1 in 2 minutes

Protocol - PEDIATRIC - TACHYDYSRYTHMIAS

- Advanced Treatment: (ALS)
  Dose - First dose – 0.1 mg/kg rapid bolus (max 6 mg)
  Second dose – 0.2 mg/kg rapid bolus (max 12 mg)

Medication	Class
ALBUTEROL	Sympathomimetic, bronchodilator

Indications

- Treatment of bronchospasm in patients with COPD/asthma
- Exacerbation of previously diagnosed asthma;
- Wheezing

Contraindications

- Known prior hypersensitivity reactions to Albuterol.
- Tachycardia dysrhythmias, especially those caused by digitalis.

Dosage and Administration

Protocol - CONGESTIVE HEART FAILURE / ACUTE PULMONARY EDEMA

- Advanced Treatment: (ALS) - For severe wheezing only
  Dose - 2.5mg. in 3cc 0.9% sodium chloride (NS) nebulized
  May repeat x 1 as needed

Protocol - ALLERGIC REACTION ANAPHYLAXIS

- Basic Treatment: (BLS) - If wheezing/bronchospasm is present
  Dose - 2.5mg in 3cc 0.9% sodium chloride (NS) nebulized;
  May repeat x 1 in 5-minutes
- Advanced Treatment: (ALS) - If wheezing/bronchospasm is present
  Dose - 2.5mg with 0.02% ipratropium bromide in 3cc 0.9% sodium chloride (NS) nebulized x 1.
  May repeat 2.5 mg. in 3cc 0.9% sodium chloride (NS) every 5-15 minutes as needed x 3.

Protocol - ASTHMA/COPD

- Basic Treatment: (BLS) - Not indicated for wheezing with acute pulmonary edema
  Dose - 2.5mg in 3cc 0.9% sodium chloride (NS)
  May repeat x 1 in 5-minutes
- Advanced Treatment: (ALS) - May be considered for severe wheezing in CHF/acute pulmonary edema
  Dose - 2.5mg with 0.02% ipratropium bromide-0.5mg in 3cc 0.9% sodium chloride (NS) nebulized
  May repeat 2.5 mg in 3cc 0.9% sodium chloride (NS) every 5-15 minutes as needed x 3.

Protocol - PEDIATRIC - ALLERGIC REACTION/ANAPHYLAXIS

- Basic Treatment: (BLS) - If wheezing/bronchospasm is present
  Dose - 2.5mg in 3cc 0.9% sodium chloride (NS) nebulized;
  May repeat x 1 in 5-minutes
- Advanced Treatment: (ALS) - If wheezing/bronchospasm is present
  Dose - 2.5mg with 0.02% ipratropium bromide in 3cc 0.9% sodium chloride (NS) nebulized x 1;
  May repeat 2.5 mg. in 3cc 0.9% sodium chloride (NS) every 5-15 minutes as needed for a total of 3-additional doses

Protocol - PEDIATRIC - ASTHMA/WHEEZING

- Basic Treatment: (BLS) - Not indicated for wheezing with acute pulmonary edema
  Dose - 2.5mg in 3cc 0.9% sodium chloride (NS) nebulized
- Advanced Treatment: (ALS)
  Dose - 2.5mg with 0.02% ipratropium bromide-0.5mg in 3cc 0.9% sodium chloride (NS) nebulized:
  May repeat 2.5 mg in 3cc 0.9% sodium chloride (NS) every 5-15 minutes as needed for a total of 3-additional doses

Medication	Class
AMIODARONE	Antidysrhythmic

Indications

- Suppression of Ventricular Fibrillation refractory to defibrillation
- Suppression of stable Ventricular Tachycardia.

Contraindications

- Second or Third Degree heart block
- Medication-induced Ventricular dysrhythmias.
- Hypotension
- Bradycardia
- Torsades de Pointes
- Profound Sinus Bradycardia
- Narrow complex (QRS <0.12 sec)

Dosage and Administration

Protocol - **ADULT NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - For V-tach / Pulseless V-fib
  Dose - 300mg IV/IO, and may repeat once at 150mg after 3-5 minutes

Protocol - **TACHYDYSRHYTHMIAS**

- Advanced Treatment: (ALS) - For stable wide complex regular tachydysrythmia
  Dose - 150mg IV/IO over 10-minutes
  May repeat x1 if no response

Protocol - **PEDIATRIC - NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - For V-tach / Pulseless V-fib
  Dose - 5 mg/kg IV/IO
  May repeat up to 2 times if no change

Protocol - **PEDIATRIC - TACHYDYSRYTHMIAS**

- Advanced Treatment: (ALS) - For stable ventricular tachycardia
  Dose - 5 mg/kg IV/IO over 20 minutes.

Medication	Class
ASPIRIN	Platelet inhibitor, anti-inflammatory agent.

Indications

- Chest pain and/or anginal equivalents suggestive of ACS.

Contraindications

- Hypersensitivity
- Gastrointestinal bleeding.

Dosage and Administration

Protocol - **CONGESTIVE HEART FAILURE/ACUTE PULMONARY EDEMA**

- General Treatment: (ALS & BLS)
  Dose - 324mg (4-baby aspirin) PO to be chewed

Protocol - **ISCHEMIC CHEST PAIN / ACUTE CORONARY SYNDROME / STEMI**

- General Treatment: (ALS & BLS)
  Dose - 324mg (4-baby aspirin) PO to be chewed

Medication	Class
ATROPINE SULFATE	Anticholinergic agent

Indications

- Hemodynamically significant (unstable) bradycardia.
- Drug of choice for organophosphate poisoning
- Nerve Agent Antidote

Contraindications

- Tachycardia
- Hypersensitivity
- Hypovolemic Shock

Dosage and Administration

Protocol - **BRADYDYSRHYTHMIAS**

- Advanced Treatment: (ALS) - For unstable dysrythmia
  Dose - 0.5mg IV/IO
  May repeat every 3-5 minutes as needed for a total dose of 0.04mg/kg (3mg max)

Protocol - **ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - If patient exhibits signs of organophosphate poisoning
  Dose - 2 mg IV repeat as noted in poisoning protocol

Protocol - **TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE**

- Advanced Treatment: (ALS) - If patient exhibits signs of organophosphate poisoning
  Dose - 2mg IV/IO initial dose
  Repeat at 4mg every 3-minutes until fully atropinized (secretions dried)

Protocol - **PEDIATRIC - BRADYDYSRYTHMIAS**

- Advanced Treatment: (ALS) - for increased vagal tone & primary av block
  Dose - 0.02 mg/kg Minimum single dose 0.1 mg and Max single dose 0.5 mg
  May repeat once

Protocol - **PEDIATRIC - ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - If patient exhibits signs of organophosphate poisoning
  Dose - 0.02 mg/kg IV repeat until drying of secretions by **OLMC Order** ☎

Protocol - **PEDIATRIC - TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE**

- Advanced Treatment: (ALS) - If patient exhibits signs of organophosphate poisoning
  Dose - 0.02 mg/kg IV repeat until drying of secretions by **OLMC Order** ☎

Medication	Class
CALCIUM CHLORIDE	Electrolyte

Indications

- Hyperkalemia
- Calcium channel blocker toxicity (overdose)

Contraindications

- Suspected Digitalis toxicity

Dosage and Administration

Protocol - **ADULT NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - If suspected hyperkalemia or calcium channel blocker overdose
  Dose - 1gm slow IV/IO with saline flush

Protocol - **BRADYDYSRHYTHMIAS**

- Advanced Treatment: (ALS) - For suspected hyperkalemia or calcium channel-blocker overdose
  Dose - 1gm IV slow push

Protocol - **ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - For suspected calcium channel-blocker overdose
  Dose - 1gm IV slow push

Protocol - **TACHYDYSRHYTHMIAS**

- Advanced Treatment: (ALS) - For suspected hyperkalemia or calcium channel-blocker overdose
  Dose - 1gm IV slow push

Protocol - **TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE**

- Advanced Treatment: (ALS) - For suspected calcium channel-blocker overdose
  Dose - 1gm IV slow push

Protocol - **PEDIATRIC - BRADYDYSRYTHMIAS**

- Advanced Treatment: (ALS) - For suspected calcium channel-blocker overdose
  Dose - 20mg/kg (0.2 mL/kg) IV/IO slow push, by **OLMC Order**☎

Protocol - **PEDIATRIC - ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - For suspected calcium channel-blocker overdose
  Dose - 20mg/kg (0.2 mL/kg) IV/IO slow push, by **OLMC Order**☎

Special Considerations

Flush line before and after administration

Medication	Class
DEXTROSE	Carbohydrate, hypertonic solution.

Indications

- Hypoglycemia
- Altered level of consciousness

Contraindications

- Hyperglycemia

Dosage and Administration

Protocol - **ADULT NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - If suspected hypoglycemia
  Dose - 25gm (50cc of D50%)

Protocol - **ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - If blood glucose concentration ≤ 60mg/dl
  Dose - 25gm (50cc of D50%) IV

Protocol - **DIABETIC EMERGENCIES**

- Advanced Treatment: (ALS)
  Dose - 25gm (50cc of D50%) IV

Protocol - **PEDIATRIC - NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - If suspected hypoglycemia
  Dose - 2-4cc/kg of D25%

Protocol - **PEDIATRIC - ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - If blood glucose concentration ≤ 60mg/dl
  Dose - D25W 2-4cc/kg IV/IO

Protocol - **PEDIATRIC - DIABETIC EMERGENCIES**

- Advanced Treatment: (ALS) - If blood glucose concentration ≤ 60mg/dl
  Dose - D25W 2-4cc/kg IV/IO

Special Considerations

Flush line before and after administration of sodium bicarbonate.

Medication	Class
DILTIAZEM HCL	Calcium channel blocker.

Indications

- Control of rapid ventricular rates caused by
  - Atrial flutter
  - Atrial fibrillation

Contraindications

- Hypotension
- 2nd or 3rd degree block
- Wide complex tachycardia
- Cardiogenic shock

Dosage and Administration

Protocol - TACHYDYSRHYTHMIAS

- Advanced Treatment: (ALS) - For stable narrow complex irregular tachydysrhythmia (atrial fibrillation)
  - Dose - 0.25mg/kg (20mg max) slow IVP over 5-minutes;
    If no response 0.35mg/kg (25mg max)
    If rate control achieved and pump available, start infusion- 5mg/hr IV

Medication	Class
DIPHENHYDRAMINE	Antihistamine; anticholinergic

Indications

- Symptomatic relief of allergies
- Allergic reactions
- Anaphylaxis
- Acute dystonic reactions (phenothiazines)

Contraindications

- Hypersensitivity

Dosage and Administration

Protocol - **ALLERGIC REACTION / ANAPHYLAXIS**

- Advanced Treatment: (ALS)
  Dose - 1mg/kg (min. dose 25mg; max. dose 50mg) IV/IO/IM

Protocol - **ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - If dystonic reactions is suspected
  Dose - 1mg/kg (min. dose 25mg; max. dose 50mg) IV/IO/IM

Protocol - **TOXIDROME/POISONING/SUBSTANCE/ABUSE/OVERDOSE**

- Advanced Treatment: (ALS) - If dystonic reactions is suspected
  Dose - 1mg/kg (min. dose 25mg; max. dose 50mg) IV/IO/IM

Protocol - **PEDIATRIC - ALLERGIC REACTION / ANAPHYLAXIS**

- Advanced Treatment: (ALS)
  Dose - 1mg/kg IV/IO/IM (max 50mg)

Protocol - **PEDIATRIC - ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - If dystonic reactions is suspected
  Dose - 1mg/kg IV/IO/IM (max 50mg) by **OLMC Order** ☎

Protocol - **PEDIATRIC - TOXIDROME/POISIONING/SUBSTANCE ABUSE/OVERDOSE**

- Advanced Treatment: (ALS) - If dystonic reactions is suspected
  Dose - 1mg/kg IV/IO/IM (max 50mg) by **OLMC Order** ☎

Medication	Class
DOPAMINE	Sympathomimetic, inotropic agent.

Indications

- Hypoperfusion
  - Cardiogenic shock
  - Septic shock
  - Spinal shock
  - Hypotension

Contraindications

- Hypovolemic shock
- Tachydysrhythmias
- Ventricular fibrillation

Dosage and Administration

Protocol - **BRADYDYSRHYTHMIAS**

- Advanced Treatment: (ALS) - For hemodynamic instability
  - Dose - 10 µg/kg/min IV/IO infusion:
    Titrate to SBP ≥ 90, signs of improvement of initial decompensation, and maximum dose of 20 µg/kg/min

Protocol - **SHOCK/HYPOTENSION**

- Advanced Treatment: (ALS) - If no response to fluid resuscitation and trauma is not suspected
  - Dose - 10 µg/kg/min IV/IO infusion
    Titrate to SBP ≥ 90, signs of improvement of initial decompensation, and maximum dose of 20 µg/kg/min

Special Considerations

Incompatible in alkaline solutions.

Medication	Class
EPINEPHRINE	Sympathomimetic

Indications

- Cardiac arrest including;
  - Asystole
  - PEA
  - Ventricular Fibrillation
  - Pulseless Ventricular Tachycardia
- Severe bronchospasm
- Asthma
- Anaphylaxis
- Acute allergic reactions

Contraindications

- Hypertension
- Hypothermia
- Coronary insufficiency
- Hypovolemic shock.

Dosage and Administration

Protocol - **ADULT NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS)
  - Dose - 1mg (10 cc of 1:10,000) IV/IO,
    May repeat every 3-5 minutes

Protocol - **ALLERGIC REACTION/ANAPHYLAXIS**

- Basic Treatment: (BLS) - If severe symptoms/signs are present, for patients weighing >30kg
  - Dose - 0.3mg of 1:1000 solution IM, or
    Administer Epi Pen auto injector IM if previously prescribed x 1
    If no response, epinephrine may be repeated x 2 total, every 5-10 minutes, contact **OLPG** for consultation.☎
- Advanced Treatment: (ALS)
  - Dose - 0.3mg of 1:1000 solution IM or
    Epi Pen auto injector IM
- Advanced Treatment: (ALS) - If signs of anaphylaxis/anaphylactic shock are present
  - Dose - 1:10,000 - 1mg (10cc) or 1:1000 - 1mg (1cc)in 1L 0.9% NS IV/IO and infuse at 1cc/minute (1mcg/minute)
    Titrate to effect by increasing/ decreasing infusion rate by 1cc/min (1mcg/minute) every 1-minute

Protocol - **ASTHMA/COPD/WHEEZING**

- Advanced Treatment: (ALS) - For asthma only (use caution in patient's with CAD)
  - Dose - 1:1000 - 0.3mg IM
    May repeat x 1 in 5-minutes, contact **OLPG** for consultation.☎

Protocol - **BRADYDYSRYTHMIAS**

- Advanced Treatment: (ALS) - For continued hypoperfusion
  - Dose - Mix 1mg in 1L 0.9% sodium chloride (NS)
    Infuse at 2-10mcg/minute titrated to patient response

Protocol - **PEDIATRIC - BRADYDYSRYTHMIAS**

- Advanced Treatment: (ALS)
  - Dose - 0.01 mg/kg (0.1 mL/kg 1:10,000)
    May repeat every 3-5 minutes

Protocol - **PEDIATRIC - NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS)
  - Dose - 0.01mg/kg (0.1ml/kg of 1:10,000) IV/IO
    May repeat every 3-5 minutes

Medication	Class
EPINEPHRINE	Sympathomimetic

Dosage and Administration continued

Protocol - PEDIATRIC - **ALLERGIC REACTION/ANAPHYLAXIS**

- Basic Treatment: (BLS) - If severe symptoms/signs are present, for patients weighing <30kg
  - Dose - 0.15mg of 1:1000 solution IM, or
    Administer Epi Pen auto injector IM if previously prescribed x 1.
    If no response, epinephrine may be repeated x 2 total, every 5-10 minutes, by **OLMC Order** ☎
- Advanced Treatment: (ALS)
  - Dose - Administer epinephrine-0.3mg.of 1:1000 solution IM or
    Epi Pen auto injector IM
    May repeat x2 every 5-10 minutes, if no response, by **OLMC Order** ☎
- Advanced Treatment: (ALS) - If signs of anaphylaxis/anaphylactic shock are present
  - Dose - 1:10,000 - 0.5mg (5cc) or 1:1000 - 0.5mg (0.5cc)in 500cc 0.9% NS IV/IO and infuse at 0.1- 1mcg/minute
    Titrate to effect by increasing/ decreasing infusion rate by 0.1cc/min (0.1mcg/minute), every 1-minute

Protocol - PEDIATRIC - **ASTHMA/WHEEZING**

- Advanced Treatment: (ALS) - For either unable to tolerate nebulizer or if impending respiratory failure
  - Dose - 0.15mg IM
    May repeat x 1 in 5-minutes, by **OLMC Order** ☎

Protocol - PEDIATRIC - **CROUP**

- Advanced Treatment: (ALS) - For severe respiratory distress
  - Dose - 1:1000 3 mg(3cc) mixed with 3mL 0.9% sodium chloride (NS) via inhalation

Protocol - PEDIATRIC - **NEWBORN RESUSCITATION**

- Advanced Treatment: (ALS) - For heart rate less than 60 after 30 seconds of compressions and patent / adequate airway confirmation
  - Dose - 0.01 mg/kg (0.1mL/kg of 1:10,000 concentration) IV/IO
    May repeat every 3-5 minutes

Medication	Class
ETOMIDATE	Sedative/hypnotic

Indications

- Induction Agent for DAI

Contraindications

- Hypersensitivity

Dosage and Administration

Protocol - **RESPIRATORY DISTRESS or FAILURE / DRUG ASSISTED INTUBATION**

- Advanced Treatment: (ALS) - If unable to intubate or achieve sufficient relaxation prior to intubation
  Dose - 0.3mg/kg IV/IO
  if insufficient sedation, consider additional doses of 0.1 mg/kg.

Medication	Class
GLUCAGON	Hyperglycemic agent, pancreatic hormone, insulin antagonist.

Indications

- Hypoglycemia
- Beta-blocker overdose

Contraindications

- Hyperglycemia
- Hypersensitivity.

Dosage and Administration

Protocol - ADULT NON-TRAUMATIC CARDIAC ARREST

- Advanced Treatment: (ALS) - For Asystole or PEA only if suspected beta-blocker overdose
  Dose - 1mg IV/IO slow push over 1 minute
  May repeat at 2mg IV/IO slow push over 1 minute x2

Protocol - BRADYDYSRYTHMIAS

- Advanced Treatment: (ALS) - For suspected beta-blocker overdose
  Dose - 1mg IV/IO slow push over 1 minute
  May repeat at 2mg IV/IO slow push over 1-minute x2

Protocol - ALTERED MENTAL STATUS

- Advanced Treatment: (ALS) - If unconscious or unable to tolerate glucose
  Dose - 1 mg IM/IN
- Advanced Treatment: (ALS) - For suspected beta-blocker overdose
  Dose - 1mg IV/IO slow push over 1 minute
  May repeat at 2mg IV/IO slow push over 1-minute x2

Protocol - DIABETIC EMERGENCIES

- Advanced Treatment: (ALS) - If IV access cannot be obtained
  Dose - 1 mg IM/IN

Protocol - TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE

- Advanced Treatment: (ALS) - For suspected beta blocker overdose
  Dose - 1mg IV/IO slow push over 1 minute
  May repeat at 2mg IV/IO slow push over 1-minute x2

Protocol - PEDIATRIC - BRADYDYSRYTHMIAS

- Advanced Treatment: (ALS) - For suspected beta blocker overdose
  Dose - 0.07 mg/kg (max 5 mg) IV/IO slow push over 1-minute, by **OLMC Order** ☎

Protocol - PEDIATRIC - NON-TRUAMATIC CARDIAC ARREST

- Advanced Treatment: (ALS)
  Dose - 0.07 mg/kg (max 5mg) IV/IO slow push over 1-minute by **OLMC Order** ☎

Protocol - PEDIATRIC - ALTERED MENTAL STATUS

- Advanced Treatment: (ALS) - If unconscious or unable to tolerate glucose, and IV cannot be obtained
  Dose - 0.1 mg/kg (1mg max dose) IM/IN
- Advanced Treatment: (ALS) - For suspected beta-blocker overdose
  Dose - 0.07mg/kg (max 5 mg) IV/IO slow push over 1-minute by **OLMC Order** ☎

Protocol - PEDIATRIC - DIABETIC EMERGENCIES

- Advanced Treatment: (ALS) - If unconscious or unable to tolerate glucose, and IV cannot be obtained
  Dose - 0.1 mg/kg (1mg max dose) IM/IN

Protocol - PEDIATRIC - TOXIDROME/POISIONING/SUBSTANCE ABUSE/OVERDOSE

- Advanced Treatment: (ALS) - For suspected beta-blocker overdose
  Dose - 0.07mg/kg (max 5 mg) IV/IO slow push over 1-minute by **OLMC Order** ☎

Medication	Class
GLUCOSE - ORAL	Hyperglycemic

Indications

- Conscious patients with suspected hypoglycemia.

Contraindications

- Decreased level of consciousness
  Unable to swallow/maintain own airway
- Nausea & vomiting

Dosage and Administration

Protocol - **ALTERED MENTAL STATUS**

- General Treatment: (BLS & ALS) - If clinically or relatively hypoglycemic, conscious and able to tolerate
  Dose - 15 G buccal

Protocol - **DIABETIC EMERGENCIES**

- General Treatment: (BLS & ALS) - If clinically or relatively hypoglycemic, conscious and able to tolerate
  Dose - 15 G buccal

Protocol - **PEDIATRIC - ALTERED MENTAL STATUS**

- General Treatment: (BLS & ALS) - If clinically or relatively hypoglycemic, conscious and able to tolerate
  Dose - 15 G buccal

Medication	Class
IPRATROPIUM BROMIDE	Bronchodilator

Indications

- Chronic Respiratory Diseases
  - Asthma
  - COPD
  - Emphysema
- Used in bronchospasm especially associated with
  - COPD
  - Emphysema.

Contraindications

- Hypersensitivity to atropine or its derivatives.

Dosage and Administration

Protocol - **ASTHMA/COPD/ WHEEZING**

- Advanced Treatment: (ALS)
  - Dose - 0.5mg in 3cc NS with 0.5% albuterol-2.5mg nebulized x1

Protocol - **PEDIATRIC - ASTHMA/WHEEZING**

- Advanced Treatment: (ALS)
  - Dose - 0.5mg in 3cc NS with 0.5% albuterol-2.5mg nebulized x1

Medication	Class
LIDOCAINE	Local anesthetic

Indications

- EZ/IO

Contraindications

Hypersensitivity

Dosage and Administration

Protocol - **EZ/IO**

- Advanced Treatment: (ALS)
- Dose - Conscious patients should receive 1-2ml 2% lidocaine IO
  Pediatric patients should receive .5mg/kg of 2% lidocaine (0.025ml/kg) IO.

Medication	Class
LORAZEPAM	Benzodiazepine; sedative; anticonvulsant

Indications

- Status epilepticus
- Severe recurrent seizures
- Severe Anxiety
- Sedation for Procedures
  - Pacing
  - Cardioversion

Contraindications

- **Hypersensivity**

Dosage and Administration

Protocol - BRADYDYSRHYTHMIAS

- Advanced Treatment: (ALS) - If midazolam is not available, for sedation prior to or during pacing
  - Dose - 1mg IV/IO

Protocol - TACHYDYSRHYTHMIAS

- Advanced Treatment: (ALS) - If midazolam is not available, for sedation during cardioversion or suspected sympathomimetic toxidrome
  - Dose - 1mg IV/IO

Protocol - EXCITED DELIRIUM

- Advanced Treatment: (ALS) - If midazolam is not available
  - Dose - 2mg IV/IO

Protocol - SEIZURES/STATUS EPILEPTICUS

- Advanced Treatment: (ALS) - If midazolam is not available
  - Dose - 2mg IV/IO
    May Repeat x 1 in 5 Minutes, contact **OLPG** for consultation. ☎

Protocol - HYPERTHERMIA

- Advanced Treatment: (ALS) - For shivering during active cooling only if midazolam is not available
  - Dose - 0.5 - 1mg IV/IO

Protocol - PEDIATRIC - BRADYCARDIA

- Advanced Treatment: (ALS) - For sedation prior to or during pacing, only if midazolam is not available.
  - Dose - 0.1mg/kg IV/IO (maximum single dose 2 mg)

Protocol - PEDIATRIC - HYPERTHERMIA

- Advanced Treatment: (ALS) - If shivering during active cooling, only if midazolam is not available.
  - Dose - 0.1mg/kg IV/IO (maximum single dose 1 mg)

Protocol - PEDIATRIC - SEIZURES/STATUS EPILEPTICUS

- Advanced Treatment: (ALS) - If actively seizing or in status epilepticus, only if midazolam is not available.
  - Dose - 0.1mg/kg IV/IO (maximum single dose 2 mg) ☎
    May repeat 0.05 mg/kg x 1 in 10-15 minutes by **OLMC Order**

Medication	Class
MAGNESIUM SULFATE	Electrolyte

Indications

- Seizures of eclampsia (Toxemia of pregnancy)
- Torsades de Pointes
- Asthma

Contraindications

- Heart blocks.
- Renal diseases.

Dosage and Administration

Protocol - **ADULT NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - Only if suspected torsades de pointes
  Dose - 2gm IV/IO, slow push over 2 minutes

Protocol - **TACHYDYSRHYTHMIAS**

- Advanced Treatment: (ALS) - Only if suspected stable torsades de pointes
  Dose - 2gm IV/IO, slow push over 2 minutes

Protocol - **ASTHMA/COPD/WHEEZING**

- Advanced Treatment: (ALS) - For severe respiratory distress
  Dose - 2gm in 50cc D5W over 10-15 minutes

Protocol - **OB/GYN EMERGENCIES**

- Advanced Treatment: (ALS) - For eclamptic seizures
  Dose - 1-4gm slow IV push over three minutes

Protocol - **SEIZURES/STATUS EPILEPTICUS**

- Advanced Treatment: (ALS) - For suspected eclampsia
  Dose - 1-4gm slow IV push over three minutes

Protocol - **PEDIATRIC - NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - For suspected torsades de pointes
  Dose - 25-50mg/kg (max 2gm) IV/IO, slow push over 2-minutes, by **OLMC Order** ☎

Protocol - **PEDIATRIC - ASTHMA/WHEEZING**

- Advanced Treatment: (ALS) - For severe respiratory distress
  Dose - 25-50mg/kg IV/IO (max 2gm) in 50cc 0.9% sodium chloride (NS) over 10-15 minutes, by **OLMC Order** ☎

Medication	Class
METHYLPREDNISOLONE	Steroid

Indications

- Severe anaphylaxis
- Asthma
- COPD

Contraindications

None in the emergency setting

Dosage and Administration

Protocol - **ALLERGIC REACTION / ANAPHYLAXIS**

- Advanced Treatment: (ALS)
  Dose - 125mg IV/IO

Protocol - **ASTHMA/COPD/WHEEZING**

Advanced Treatment: (ALS) - For severe respiratory distress especially if subacute presentation (e.g., > 1-2 days)
Dose - 125mg IV/IO

Protocol - **PEDIATRIC - ALLERGIC REACTION / ANAPHYLAXIS**

- Advanced Treatment: (ALS)
  Dose - 2mg/kg IV/IO (max 60mg)

Protocol - **PEDIATRIC - ASTHMA/WHEEZING**

Advanced Treatment: (ALS) - For severe respiratory distress especially if subacute presentation (e.g., > 1-2 days)
Dose - 2mg/kg IV/IO by **OLMC Order** ☎

Medication	Class
MIDAZOLAM	Short-acting benzodiazepine CNS depressant

Indications

- Sedation for procedures
  - Cardioversion
  - Pacing
- Sympathomimetic overdose
- Seizures
- Drug assisted Intubation
- Excited delirium

Contraindications

- Depressed Vital signs
  - Shock
  - Overdosed patient
- Concurrent use with other CNS depressants
  - Barbiturates
  - Alcohol
  - Narcotics

Dosage and Administration

Protocol - BRADYDYSRHYTHMIAS

- Advanced Treatment: (ALS) - For sedation prior to or during pacing
  Dose - 2mg IV/IO or 2 - 10mg IN Titrate to effect (maximum IN dose 10mg)

Protocol - TACHYDYSRHYTHMIAS

- Advanced Treatment: (ALS) - For sedation prior to cardioversion
  Dose - 2mg IV/IO or 2 - 10mg IN Titrate to effect (maximum IN dose 10mg)
- Advanced Treatment: (ALS) - For suspected sympathomimetic toxidrome
  Dose - 2mg IV/IO or 10mg IN

Protocol - EXCITED DELIRIUM

- Advanced Treatment: (ALS)
  Dose - 2-4mg IV/IO or 10mg IM/IN
  May repeat x 1 in 5 minutes, contact **OLPG** for consultation. ☎

Protocol - OB/GYN EMERGENCIES

- Advanced Treatment: (ALS) - For eclamptic seizures
  Dose - 2-4mg slow IV/IO push or 10mg IM/IN

Protocol - RESPIRATORY DISTRESS or FAILURE / DRUG ASSISTED INTUBATION

- Advanced Treatment: (ALS) - If further sedation is required once intubated
  Dose - 2mg IV/IO or 10mg IM for SBP > 100,
  May repeat x1 in 5 minutes, contact **OLPG** for consultation. ☎

Protocol - SEIZURES/STATUS EPILEPTICUS

- Advanced Treatment: (ALS)
  Dose - 2-4mg slow IV/IO push or 10mg IM/IN
  May repeat x1, contact **OLPG** for consultation. ☎

Protocol - TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE

- Advanced Treatment: (ALS) - For suspected sympathomimetic toxidrome (cocaine/amphetamines O.D.)
  Dose - 2-4mg IV/IO or 10mg IM/IN

SEE NEXT PAGE FOR MORE MIDAZOLAM PROTOCOLS

Medication	Class
MIDAZOLAM	Short-acting benzodiazepine CNS depressant

Dosage and Administration continued

Protocol - HYPERTHERMIA

- Advanced Treatment: (ALS) - For shivering during active cooling
  Dose - 1 - 2mg IV/IO/IN

Protocol - PEDIATRIC - SEIZURES/STATUS EPILEPTICUS

- Advanced Treatment: (ALS) - If actively seizing or in status epilepticus
  Dose - 0.15mg/kg IV/IM/IN (maximum single dose 2mg)
  May repeat x1 in 5-10 minutes by OLMC Order ☎

Protocol - PEDIATRIC - HYPERTHERMIA

- Advanced Treatment: (ALS) - If shivering during active cooling
  Dose - 0.1mg/kg IV/IM/IN (maximum single dose 1mg)

Medication	Class
MORPHINE SULFATE	Opioid analgesic

Indications

- Analgesia for moderate to severe acute pain

Contraindications

- Head injury
- Exacerbated COPD
- Depressed level of consciousness
  Depressed respiratory drive
- Hypotension
- Undiagnosed abdominal pain
- Suspected hypovolemia
- Patients who have taken MAOIs within past 14 days

Dosage and Administration

Protocol - **PAIN MANAGEMENT**

- Advanced Treatment: (ALS) - For moderate-to-severe pain associated with Burns, isolated injuries, and other pain syndromes (see protocol for more specific information)

  Dose - 2-4 mg IV/IO/IM and may repeat 2mg every 5-minutes to maximum of 10mg, contact **OLPG** for consultation. ☎

Protocol - **PEDIATRIC - PAIN MANAGEMENT**

- Advanced Treatment: (ALS)

  Dose - 0.1mg/kg IV/IO/IM may repeat every 5-minutes to maximum of 10mg, all by **OLMC Order** ☎

Medication	Class
NALOXONE	Narcotic antagonist

Indications

- Opiate overdose with depressed CNS
  - Decreased LOC
  - Coma
- Complete or partial reversal of opioids
  - CNS depression
  - Respiratory depression
- Coma of unknown origin.

Contraindications

- Use with caution in narcotic-dependent patients
- Use with caution in neonates of narcotic-addicted mothers.

Dosage and Administration

Protocol - ADULT NON-TRAUMATIC CARDIAC ARREST

- Advanced Treatment: (ALS) For asystole or PEA if suspected opiate/opioid overdose
  - Dose - 2mg IV/IO
  - May repeat every 5-minutes to a maximum dose of 10mg

Protocol - ALTERED MENTAL STATUS

- Advanced Treatment: (ALS) - If narcotic overdose is suspected
  - Dose - 0.4 - 2.0mg IV/IO/IN
  - May repeat every 5 minutes to a max dose of 10mg

Protocol - TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE

- Advanced Treatment: (ALS) - For suspected opiate/opioid overdose
  - Dose - 0.4 - 2mg IV/IO/IN
  - May repeat every 5-minutes to a maximum dose of 10mg

Protocol - PAIN MANAGEMENT

- Advanced Treatment: (ALS) - If respiratory depression occurs following morphine administration
  - Dose - 0.4mg-2mg IV/IO/IN, titrated to respiratory status.

Protocol - PEDIATRIC - NON-TRAUMATIC CARDIAC ARREST

- Advanced Treatment: (ALS) For asystole or PEA if suspected opiate/opioid overdose
  - Dose - 0.1mg/kg IV/IO (maximum single dose 2mg)
  - May repeat every 5-minutes to a maximum dose of 2mg

Protocol - PEDIATRIC - ALTERED MENTAL STATUS

- Advanced Treatment: (ALS) - If narcotic overdose is suspected
  - Dose - 0.1 mg/kg (maximum single dose 2mg) IV/IO/IN

Protocol - PEDIATRIC - PAIN MANAGEMENT

- Advanced Treatment: (ALS) - If respiratory depression occurs following morphine administration
  - Dose - 0.1mg/kg (maximum dose 2mg) IV/IO/IN, titrated to respiratory status

Protocol - PEDIATRIC - TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE

- Advanced Treatment: (ALS) - If narcotic overdose is suspected
  - Dose - 0.1 mg/kg (maximum single dose 2mg) IV/IO/IN

Medication	Class
NITROGLYCERIN	Vasodilators

Indications

- Acute angina pectoris
- Ischemic chest pain
- Congestive Heart Failure
  Pulmonary edema

Contraindications

- Recent use of erectile dysfunction medications
  e.g. - cialis, Levitra, or Viagra
- Hypotension
- Hypovolemia
- Intracranial bleeding
  Head injury

Dosage and Administration

Protocol - **CONGESTIVE HEART FAILURE / ACUTE PULMONARY EDEMA**

- Basic Treatment: (BLS) - For chest pain
  Dose - If patient has been previously prescribed nitroglycerin, assist with administration
  NTG - 0.4mg SL every 5-minutes
  Titrate to SBP $\geq$ 100 and symptoms/signs (recheck blood pressure after each dose given)

- Advanced Treatment: (ALS)
  Dose - 0.4mg SL every 5-minutes
  Titrate to SBP $\geq$ 100 and symptoms/signs (recheck blood pressure after each dose given)

Protocol - **ISCHEMIC CHEST PAIN/ACUTE CORONARY SYNDROME/STEMI**

- Basic Treatment: (BLS)
  Dose - If patient has been previously prescribed nitroglycerin, assist with administration
  NTG - 0.4mg SL every 5-minutes
  Titrate to SBP $\geq$ 100 and symptoms/signs (recheck blood pressure after each dose given)

- Advanced Treatment: (ALS)
  Dose - 0.4mg SL every 5-minutes
  Titrate to SBP $\geq$ 100 and symptoms/signs (recheck blood pressure after each dose given)

Medication	Class
ONDANSETRON (Zofran)	Anti-emetic

Indications

- Nausea and vomiting
- May also be used in conjunction with morphine sulfate
  When not well-tolerated secondary to its GI effects

Contraindications

- Avoid if history of known hypersensitivity
- Avoid repeat dosing in patients with known abnormal liver function.

Dosage and Administration

Protocol - **ISCHEMIC CHEST PAIN/ACUTE CORONARY SYNDROME/STEMI**

- Advanced Treatment: (ALS) - For severe nausea/vomiting
  Dose - 4mg IV

Protocol - **ABDOMINAL PAIN**

- Advanced Treatment: (ALS) - For severe nausea/vomiting
  Dose - 4mg IV/IO/IM
  May repeat x 1 in 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **NAUSEA/VOMITING**

- Advanced Treatment: (ALS) - For severe nausea/vomiting
  Dose - 4mg IV/IO/IM
  May repeat x 1 in 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **PAIN MANAGEMENT**

- Advanced Treatment: (ALS) - For narcotic associated nausea/vomiting
  Dose - 4mg IV/IO/IM
  May repeat x 1 in 10-minutes

Protocol - **PEDIATRIC - ABDOMINAL PAIN**

- Advanced Treatment: (ALS) - For severe nausea/vomiting
  Dose - 0.1 mg/kg (max dose 4mg) IV/IM, may repeat x 1 in 10-minutes, all by **OLMC Order** ☎

Protocol - **PEDIATRIC - NAUSEA/VOMITING**

- Advanced Treatment: (ALS) - For severe nausea/vomiting
  Dose - 0.1 mg/kg (max dose 4mg) IV/IM, may repeat x 1 in 10-minutes, all by **OLMC Order** ☎

Protocol - **PEDIATRIC - PAIN MANAGEMENT**

- Advanced Treatment: (ALS) - For narcotic associated nausea/vomiting
  Dose - 0.1 mg/kg (max dose 4mg) IV/IM, may repeat x 1 in 10-minutes, all by **OLMC Order**

Medication	Class
OXYGEN	Naturally occurring atmospheric gas

Indications

- Respiratory insufficiency
- Confirmed or expected hypoxemia
- Ischemic chest pain
- All other causes of decreased oxygenation

Contraindications

- Use caution in COPD/Emphysema patients
  Some will not tolerate Oxygen concentrations over 35%
- Hyperventilation.

Dosage and Administration

Protocol - ALL OF THEM

- General Treatment: (BLS & ALS)
  Dose - Titrate to oxygen saturation >95% and work of breathing

Medication	Class
SODIUM BICARBONATE 8.4%	Buffer, alkalinizer

Indications

- Known or suspected pre-existing acidosis
- TCA overdose
- Hyperkalemia
-

Contraindications

- Metabolic and respiratory alkalosis
- Hypocalcaemia

Dosage and Administration

- Hypokalemia

Protocol - **ADULT NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - For suspected prolonged acidosis, hyperkalemia or TCA Overdose

  Dose - 1mEq/kg
  May repeat 0.5meq/kg every 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **BRADYDYSRHYTHMIAS**

- Advanced Treatment: (ALS) - For suspected prolonged acidosis or hyperkalemia

  Dose - 1mEq/kg
  May repeat 0.5meq/kg every 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **TACHYDYSRYTHMIAS**

- Advanced Treatment: (ALS) - For presumed hyperkalemia

  Dose - 1mEq/kg
  May repeat 0.5meq/kg every 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - For suspected TCA overdose

  Dose - 1mEq/kg IV
  May repeat 0.5meq/kg every 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **EXCITED DELIRIUM**

- Advanced Treatment: (ALS) - For sudden witnessed cardiac arrest administer early, or prolonged s/s

  Dose - 1meq/kg IV/IO,
  May repeat 0.5meq/kg every 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE**

- Advanced Treatment: (ALS) - For suspected TCA overdose

  Dose - 1mEq/kg IV/IO
  May repeat 0.5meq/kg every 10-minutes, contact **OLPG** for consultation. ☎

Protocol - **PEDIATRIC - BRADYDYSRYTHMIAS**

- Advanced Treatment: (ALS) - For suspected prolonged/severe acidosis

  Dose - 1 mEq/kg IV/IO by **OLMC Order** ☎
  4.2% concentration recommended for infants younger than one month

Protocol - **PEDIATRIC - NON-TRAUMATIC CARDIAC ARREST**

- Advanced Treatment: (ALS) - For suspected prolonged acidosis, hyperkalemia, or TCA overdose

  Dose - 1mEq/kg IV/IO and
  May repeat 0.5mEq/kg every 10-minutes, by **OLMC Order** ☎
  4.2% concentration recommended for infants younger than 1 month

SEE NEXT PAGE FOR MORE SODIUM BICARBONATE PROTOCOLS

Medication	Class
SODIUM BICARBONATE 8.4%	Buffer, alkalinizer

Dosage and Administration continued

Protocol - PEDIATRIC - **ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - For suspected TCA overdose
  Dose - 1mEq/kg IV, by **OLMC Order** ☎

Protocol - PEDIATRIC - **TOXIDROME/POISONING/SUBSTANCE ABUSE/OVERDOSE**

- Advanced Treatment: (ALS) - For suspected TCA overdose
  Dose - 1mEq/kg IV, by **OLMC Order**

Medication	Class
THIAMINE	Vitamin (B1)

Indications

- Altered Mental Status
- Coma of unknown origin
- Malnutrition with history of alcoholism

Contraindications

- None

Dosage and Administration

Protocol - **ALTERED MENTAL STATUS**

- Advanced Treatment: (ALS) - If altered mental status, and alcoholism/malnourishment
  Dose - 100 mg IV/IM

Protocol - **DIABETIC EMERGENCIES**

- Advanced Treatment: (ALS) - If altered mental status, and alcoholism/malnourishment
  Dose - 100 mg IV/IM as per Altered Mental Status protocol

Protocol - **SEIZURES/STATUS EPILEPTICUS**

- Advanced Treatment: (ALS) - If suspected alcohol withdrawal seizure
  Dose - 100 mg IV/IM as per Altered Mental Status protocol

Medication	Class
VASOPRESSIN	Hormone, Vasoconstrictor

Indications

- Cardiac Arrest

Contraindications

- None when used in an emergency setting

Dosage and Administration

Protocol - ADULT NON-TRAUMATIC CARDIAC ARREST

- Advanced Treatment: (ALS)
  Dose - 40u IV/IO, one dose only

ANTIDOTES

All runs involving the use of an antidote will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for antidote use
  - Dose of antidote given
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and ongoing patient assessments, including vitals

CPAP

All runs involving the use of CPAP will be reviewed for the following:

- Protocol compliance
- Use of continuous $EtCO_2$ monitoring throughout case
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for CPAP use
  - Positive airway pressure setting
  - Time CPAP was initiated
  - Pre-CPAP patient assessment, including vitals, pulse ox, $EtCO_2$, and lung sounds
  - Post-CPAP and on-going patient assessments, , including vitals, pulse ox, $EtCO_2$, and lung sounds

C-SPINE CLEARANCE

All runs involving the use of the c-spine clearance procedure will be reviewed for the following:

- Protocol compliance
- Completeness of c-spine clearance form
- Appropriateness of decision to clear c-spine
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Injury indicators (description of damage to vehicle, description of fall, etc)
  - Full initial patient assessment including vitals
  - Repeat patient assessment(s), including vitals

DILTIAZEM

All runs involving the use of diltiazem will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for diltiazem use
  - Dose of diltiazem given (including infusion)
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and on-going patient assessments, including vitals

DOPAMINE

All runs involving the use of dopamine will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for dopamine use
  - Dose of dopamine given
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and ongoing patient assessments, including vitals

EPINEPHRINE IM

All runs involving the use of IM epinephrine will be reviewed for the following:

- Protocol compliance
- No contraindication for drug use
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for IM epinephrine use
  - Dose of IM epinephrine given
  - Time of administration
  - Pre-administration patient assessment, including vitals, pulse ox, and lung sounds
  - Post-administration and ongoing patient assessments, including vitals, pulse ox, and lung sounds

EPINEPHRINE IV

All runs involving the use of IV epinephrine will be reviewed for the following:

- Protocol compliance
- Use of continuous $EtCO_2$ monitoring throughout run
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for IV epinephrine use
  - Dose of IV epinephrine given (including concentration)
  - Time of administration
  - Pre-administration patient assessment, including vitals, pulse-ox, skin color/condition, and lung sounds
  - Post-administration and ongoing patient assessments, including vitals, pulse-ox, skin color/condition, and lung sounds

EPINEPHRINE NEBULIZED

All runs involving the use of nebulized epinephrine will be reviewed for:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for nebulized epinephrine use
  - Dose of nebulized epinephrine given
  - Time of administration
  - Pre-administration assessment, including vitals, pulse ox, and lung sounds
  - Post-administration and on on-going assessments, including vitals, pulse ox, and lung sounds

ETOMIDATE

All intubations involving the use of etomidate will be reviewed for the following:

- Protocol compliance
- Completion of NAEMSP airway form
- Thorough documentation including all intubation documentation listed and:
  - Indications for use of drug assisted intubation
  - Dose of etomidate given
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals, pulse ox, $EtCO_2$, and lung sounds
  - Post-administration and ongoing patient assessments, including vitals, pulse ox, $EtCO_2$, and lung sounds
  - Any adjuncts used to facilitate intubation (bougie, cricoid pressure)
  - Any adverse reactions or problems noted during run
  - If midazolam is used in conjunction with etomidate, the following should be included as well:
    - Indications for midazolam use
    - Dose of midazolam given
    - Route of administration
    - Time of administration

EXCITED DELIRIUM

All excited delirium runs will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Signs/symptoms of excited delirium
  - Details of physical restraint process (if applicable) including:
    - Position patient is restrained in
    - Placement of restraints (extremities, chest strap, knee strap)
  - Details of midazolam administration (if applicable) including:
    - Indications for versed use
    - Dose of midazolam given
    - Route of administration
    - Time of administration
    - Pre-administration patient assessment, including vitals
    - Post-administration and ongoing patient assessments, including vitals

HYPERKALEMIA

All runs involving the use of sodium bicarbonate and calcium chloride for hyperkalemia will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for use
  - Dose given
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and on-going patient assessments, including vitals

INTUBATIONS

All intubations will be reviewed for the following:

- Protocol compliance
- $EtCO_2$ use throughout case
- Appropriate oxygenation prior to, during, and between attempts
- Appropriate length of attempt (<30 seconds)
- Use of cardiac monitoring during intubation
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Intubation indicators
  - Pre-intubation patient assessment, including vitals, pulse ox, $EtCO_2$, and lung sounds
  - Post-intubation and ongoing patient assessments, including vitals, pulse ox, $EtCO_2$, and lung sounds
  - Depth of tube(cm at teeth)
  - Size of tube
  - Location of tube (right or left nare) in cases of nasal intubation
  - Any adjuncts used to facilitate intubation (bougie, cricoid pressure)

ISCHEMIC CHEST PAIN/ACS/STEMI

All ischemic chest pain/ACS/STEMI runs will be reviewed for the following:

- 12-lead EKG acquisition within 5 minutes
- 12-lead EKG transmission from patient side (when a STEMI is present) within 10 minutes
- ASA administration within 5 minutes
- Nitroglycerin administration
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Signs/symptoms, including pertinent negatives
  - Initial patient assessment, including vitals
  - Post-intervention and on-going patient assessment, including vitals

MAGNESIUM SULFATE

All runs involving the use of magnesium sulfate will be reviewed for the following:

- Protocol compliance
- Use of continuous $EtCO_2$ monitoring throughout case
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for magnesium sulfate use
  - Dose of magnesium sulfate given
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals, pulse ox, and lung sounds
  - Post-administration and ongoing patient assessments, including vitals, pulse ox, and lung sounds

METHYLPREDNISOLONE

All runs involving the use of methylprednisolone will be reviewed for the following:

- Protocol compliance
- Use of continuous $EtCO_2$ monitoring throughout case
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for methylprednisolone use
  - Dose of methylprednisolone given
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals, pulse ox, and lung sounds
  - Post-administration and ongoing patient assessments, including vitals, pulse ox, and lung sounds

MIDAZOLAM

All runs involving the use of midazolam will be reviewed for the following:

- Protocol compliance
- Use of continuous $EtCO_2$ monitoring throughout case
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for midazolam use
  - Dose of midazolam given
  - Route of administration
  - Time of administration
  - Pre-administration assessment, including vitals
  - Post-administration assessment, including vitals

MORPHINE

All runs involving the use of morphine will be reviewed for the following:

- Protocol compliance
- Use of continuous EtCO2 monitoring throughout case
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for morphine use
  - Inclusion of pain scale
  - Dose of morphine given
  - Route of administration
  - Time of administration
  - Pre-administration assessment, including vitals and pain scale
  - Post-administration assessment, including vitals and pain scale

NEEDLE THORACENTESIS

All runs involving the use of needle thoracentesis will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for use
  - Location utilized
  - Time of needle placement
  - Pre-administration patient assessment, including vitals and lung sounds
  - Post-administration and ongoing patient assessments, including vitals and lung sounds

NON-TRAUMATIC CARDIAC ARRESTS

All cardiac arrests will be reviewed for the following:

- Protocol compliance
- Use of continuous $EtCO_2$ monitoring throughout case
- Minimal disruption to compressions (less than 10 sec)
- Use of passive ventilation, when indicated
- Completion of at least 6 minutes of CPR prior to advanced airway or supraglottic airway placement
- Transport only initiated after the specified requirements are met
- Utilization of Pit Crew model
- Thorough documentation including:
  - Past medical history, including medications and allergies (when available)
  - History of present illness
  - Pit Crew assignments (name of personnel in each position)
  - Attachment of monitor data to ePCR

ONDANSETRON

All runs involving the use ondansetron will be reviewed for the following:

- Protocol compliance
- Thorough documentation including:
  - Past medical history, including current medications and allergies
  - History of present illness
  - Indications for ondansetron use (severe vomiting)
  - Dose of ondansetron given
  - Route of administration
  - Time of administration
  - Pre-administration patient assessment, including vitals
  - Post-administration and ongoing patient assessments, including vitals

APPENDIX B - MEDICAL CONSULTATION CHART

MEDICATIONS	BLS	ALS	BLS	ALS
Adenosine		All doses		
Albuterol	All doses	All doses		
Amiodarone		All doses		
Aspirin	All doses	All doses		
Atropine		Unstable bradys		
		Adult organophosphates		Ped organophosphates
Calcium Chloride		Hyperkalemia		
		Adult CCB overdose		Ped CCB overdose
Dextrose		All Doses		
Diltiazem		All Doses		
Diphenhydramine		All adult doses		Ped dystonic reactions
Dopamine		All doses		
Epinephrine	All anaphylaxis doses	All anaphylaxis doses	Anaphlylaxis 2nd dose	
		Cardiac arrest		
		Asthma 1st dose		Asthma 2nd dose
		Ped bradys		
		Ped croup		
Etomidate		All doses		
Glucagon		All adult doses		Ped beta blocker overdose
Glucose		All doses		
Ipatroprium bromide		All doses		
Lidocaine		IO dose		
Lorazepam		Sedation		
		Excited delirium		
		Hyperthermia shivering		
		Resp distress/DAI		
		Seizure 1st dose		Seizure 2nd dose
Magnesium sulfate		All adult doses		All ped doses
Methylprednisolone		All adult dosages		
		Ped anaphylaxis		Ped asthma
Midazolam		Sedation		
		Excited delirium 1st dose		Excited delirium 2nd dose
		Eclamptic seizures		
		Seizure 1st dose		Seizure 2nd dose
		Sympathomimetic O.D.		
Morphine				All adult doses
				All ped doses
Naloxone		All doses		
Nitro-glycerine	All doses	All doses		
Ondansetron		Adult 1st dose		Adult 2nd dose
				All ped doses
Sodium bicarbonate		All adult doses		Adult 2nd dose
				All ped doses
Thiamine		All doses		
Vasopressin		All doses		

LEGEND		STANDING ORDERS	CONSULT OLPG	OLMC REQUIRED

MEDICATION	FINDINGS	GENERAL	BLS	ALS
ADENOSINE	Narrow Complex/ Regular SVT			12mg IV/IO Repeat 12mg IV/IO q2 x1
	Pediatric Narrow/ Complex REG SVT			0.1 mg/kg IV/IO (max 6mg) rapid push 0.2 mg/kg IV/IO (max 12mg) rapid push
ALBUTEROL	CHF			2.5mg neb (for severe wheezing)
	Anaphylaxis/ Wheezing		2.5mg neb q5 x2	2.5mg neb w/ ipratroprium bromide x1 Repeat 2.5 mg x3
	Asthma/COPD/ Wheezing		2.5mg neb q5 x2	2.5mg neb w/ ipratroprium bromide x1 Repeat 2.5 mg x3
	Pediatric Anaphylaxis / Wheezing		2.5mg neb q5 x1	2.5mg neb w/ ipratroprium bromide x1 Repeat 2.5 mg x3
	Pediatric Asthma / Wheezing		2.5mg neb	2.5mg neb w/ ipratroprium bromide x1 Repeat 2.5 mg x3
AMIODARONE	V-Fib Pulseless V-Tach			300mg IV/IO Repeat 150mg q3-5 x1
	Wide Complex Regular Tachycardia			150MG IV/IO over 10 minutes Repeat x1
	Pediatric V-Fib Pulseless V-Tach			5mg/kg IV/IO Repeat x2 if no change
	Pediatric V-Tach w/ a Pulse			5mg/kg over 20 minutes
ASPIRIN	CHF	324mg PO		
	Chest Pain/STEMI/ACS	324mg PO		
ATROPINE	Bradydysrhythmias			0.5mg IV/IO q3-5 (max 0.04mg/kg)
	Organophosphate Poisoning			2mg IV/IO Repeat at 4mg q3 until atropinized
	Pediatric Bradydysrhythmias			0.02 mg/kg IV (min 0.1mg max 0.5mg) Repeat x1
	Pediatric Organophophate Poisoning			0.02 mg/kg IV Repeat q3 until atropinized
CALCIUM CHLORIDE	Calcium Channel Blocker O.D.			1G IV/IO slow push
	Hyperkalemia			1G IV/IO slow push
	Pediatric CCB O.D.			20 mg/kg (0.2ml/kg) IV/IO slow push
DEXTROSE	Hypoglycemia			25G (50cc of D50%) IV/IO
	Pediatric Hypoglycemia			2-4 cc/kg of D25% IV/IO
DILTIAZEM	Symptomatic A-Fib			0.25mg/kg (20mg max) over 5 min If no response 0.35mg/kg (25mg max) If controlled start infusion 5mg/hr IV
DIPHENHYDRAMINE	Anaphylaxis			1mg/kg IV/IO/IM (min 25mg max 50mg)
	Dystonic Reactions			1mg/kg IV/IO/IM (min 25mg max 50mg)
	Pediatric Anaphylaxis			1mg/kg IV/IO/IM (max 50mg)
	Pediatric Dystonic Reactions			1mg/kg IV/IO/IM (max 50mg)

LEGEND	PEDIATRIC	STANDING ORDERS	CONSULT OLPG	MEDICAL CONTROL REQUIRED

APPENDIX B - MEDICATION CHARTS - DOSING

MEDICATION	FINDINGS	GENERAL	BLS	ALS
DOPAMINE	Hemodynamic Instability			10 µg/kg/min IV/IO infusion Titrate to SBP ≥ 90/signs of improvement Max dose 20 µg/kg/min
EPINIEPHRINE	Asystole/PEA/V-Fib/			1mg (1:10,000) q3-5
	Anaphylaxis		0.3mg (1:1,000) IM Repeat x2 q5-10	0.3mg (1:1,000) IM Repeat x2 q5-10
	Severe Anaphylaxis			1mg in 1L 0.9% NS at 1cc/minute Titrate - Increase infusion 1cc/minute q1
	Asthma/COPD/Wheezing			0.3mg (1:1,000) IM Repeat x1 q5
	Pediatric Bradydysrhythmias			0.01mg/kg (0.1ml/kg 1:10,000) Repeat q3-5
	Pediatric Asystole/PEA/V-Fib			0.01mg/kg (0.1ml/kg of 1:10,000) IV/IO Repeat q3-5
	Pediatric Anaphylaxis		0.15mg (1:1,000) IM Repeat q5-10 x2	0.15mg (1:1,000) IM Repeat q5-10 x2
	Pediatric Severe Anaphylaxis			0.5mg in 500cc NS at 0.1cc minute Titrate - Increase infusion at 0.1cc/min q1
	Pediatric Asthma/Wheezing			0.15mg (1:1,000) IM Repeat q5 x1
	Pediatric Croup			3mg (1:1,000) in 3cc NS via neb
	Pediatric Newborn Resuscitation			0.01mg/kg (0.1ml/kg 1:10,000) IV/IO Repeat q3-5
ETOMIDATE	Respiratory Distress/DAI			0.3mg/kg IV/IO Repeat at 0.1mg/kg IV/IO
GLUCAGON	Beta Blocker Overdose			1mg IV/IO Slow push over 1 minute Repeat at 2mg IV/IO x2
	Hypoglycemia			1mg IM/IN
	Pediatric Beta Blocker O.D.			0.07 mg/kg (max 5 mg) slow IV push
	Pediatric Hypoglycemia			0.1mg/kg (1mg max dose) IM/IN
GLUCOSE	Hypoglycemia	15 G Buccal		
IPRATROPRIUM BROMIDE	Asthma/COPD/Wheezing			0.5mg w/ Albuterol neb x1
	Pediatric Asthma/Wheezing			0.5mg w/ Albuterol neb x1
LIDOCAINE	EZ/IO			1-2ml IO
	Pediatric EZ/IO			0.5 mg/kg (0.025cc/kg) IO
LORAZEPAM	Sedation Pacing/Cardiovert			1mg IV/IO
	Excited Delirium			2mg IV/IO
	Seizures/Status			2mg IV/IO Repeat q5 x1
	Hyperthermic Shivers			0.5-1 mg IV/IO
	Pediatric Seizures/Status			0.1 mg/kg IV/IO Repeat at 0.05 mg/kg q10-15 x1

LEGEND	PEDIATRIC	STANDING ORDERS	CONSULT OLPG	MEDICAL CONTROL REQUIRED

APPENDIX B - MEDICATION CHARTS - DOSING

MEDICATION	FINDINGS	GENERAL	BLS	ALS
MAGNESIUM SULFATE	Torsades de Pointes			2G IV/IO slow IV push over 2 minutes
	Severe Respiratory Distress			2G in 50cc NS over 10-15 minutes
	Eclamptic Seizures			1-4 G Slow IV push over 3 minutes
	Pediatric Torsades			25-50 mg/kg (max 2G) IV push over 2 min
	Pediatric Asthma Wheezing			25-50 mg/kg (max 2G) in 50cc NS over 10-15
METHYLPREDNISO-LONE	Severe Respiratory Distress			125 mg IV/IO
	Resp Distress 2° Anaphylaxis			125 mg IV/IO
	Pediatric Resp 2° Anaphylaxis			2mg/kg IV/IO (max 60mg)
	Pediatric Resp Distress			2mg/kg IV/IO (max 60mg)
MIDAZOLAM	Sedation Pacing/Cardiovert			2mg IV/IO/IN
	Excited Delirium			0.1 mg/kg (5mg max) IM/IN or 2mg IV/IO
				Repeat q5 x1
	Cocaine/Amphetamine O.D.			2mg IV/IO/IN
	Seizures/Status			2-4mg slow IV push/IN or 10mg IN
				Repeat x1
	Eclamptic Siezures			2-4mg slow IV push/IN or 10mg IN
	Hyperthermic Shivers			1-2mg IV/IO/IN
	Pediatric Seizures/Status			0.15mg/kg IV/IM/IN
MORPHINE	Pain Management			2-4mg IV/IO/IM
				Repeat 2mg q5 (max 10mg)
	Pediatric Pain Management			0.1 mg/kg IV/IO/IM
				Repeat q5 (max 10mg)
NALOXONE	Opiate/Opiod Overdose			0.4-2mg IV/IO/IN
				Repeat q5 (max 10mg)
	Resp distress 2° pain management			0.4-2mg IV/IO/IN titrate to respiratory status
	Pediatric Opiate/Opiod Overdose			0.1mg/kg (max single dose 2mg) IV/IO/IN
	Ped resp 2° pain management			0.1mg/kg (max single dose 2mg) IV/IO/IN
NITROGLYCERINE	Chest Pain		Assist 0.4mg SL q5	0.4mg SL q5
	CHF			0.4mg SL q5
ONDANSETRON	Severe N/V			4mg IV/IO/IM
	Pediatric Severe N/V			0.1 mg/kg (max 4mg) IV/IM
				Repeat q5 x1
SODIUM BICARBONATE	Acidosis/Hyperkalemia/TCA O.D.			1 mEq/kg
				Repeat 0.5 mEq/kg q10
	Pediatric Acidosis/Hyperkalemia			1 mEq/kg IV/IO
	TCA overdose			Repeat 0.5 mEq/kg q10
				4.2% recommended for infants ≥ 1 month
THIAMINE	Altered mental w/ malnourishment			100mg IV/IM
VASOPRESSIN	Cardiac Arrest			40u IV/IO

LEGEND	PEDIATRIC	STANDING ORDERS	CONSULT OLPG	MEDICAL CONTROL REQUIRED

Mixing / Dosing Chart

Treatments:

Amiodarone:

Adult Dose: Advanced Treatment: (ALS) - For stable wide complex regular tachydysrythmia
Dose - 150mg IV/IO over 10-minutes
May repeat x1 if no response

Mix 150mg of Amiodarone into 50cc D5W, using a **10 drop set** and the Stat 2 pumpette extension set. Set dial on the flow meter to 300ml/hr.

Pediatric Dose: Advanced Treatment: (ALS) - For stable ventricular tachycardia
Dose - 5 mg/kg (150mg max) IV/IO over 20 minutes.

	11lbs (5 kg)	22 lbs (10 kg)	30lbs (15kg)	44lbs (20 kg)	55lbs (25 kg)	66lbs (30 kg)	77lbs (35 kg)	88lbs (40 kg)	99lbs (45 kg)	110lbs (50 kg)
Ped dose 5mg/kg	25mg	50mg	75mg	100mg	125mg	150mg	150mg	150mg	150mg	150mg

Mix desired dose of Amiodarone (use above chart) in 50cc D5W, using a 60 drop set and the Stat 2 pumpette extension set. Set dial on the flow meter to 150ml/hr.

Dialtiazem:

Adult Dose: 0.25mg/kg (20mg max) slow IVP over 5-minutes;
If no response 0.35mg/kg (25mg max)
If rate control achieved and pump available, start infusion- 5mg/hr IV

Infusion: 5mg/hr

	110lbs (50 kg)	121lbs (55 kg)	132lbs (60kg)	143lbs (65 kg)	154lbs (70 kg)	165lbs (75 kg)	176lbs (80 kg)	187lbs (85 kg)	198lbs (90 kg)	209lbs (95 kg)	220lbs (100 kg)	231lbs (105 kg)
Initial dose 0.25mg/kg	12.5mg (2.5cc)	13.75mg (2.75cc)	15mg (3cc)	16.25mg (3.25cc)	17.5mg (3.5cc)	18.75mg (3.75cc)	20mg (4cc)	20mg (4cc)	20mg (4cc)	20mg (4cc)	20mg (4cc)	20mg (4cc)
Repeat dose 0.35/mg/kg	17.5mg (3.5cc)	19.25mg (3.85cc)	21mg (4.2cc)	22.75mg (4.55cc)	24.5mg (4.9cc)	25mg (5cc)	25mg (5cc)	25mg (5cc)	25mg (5cc)	25mg (5cc)	25mg (5cc)	25mg (5cc)

Mix 25mg (5cc) of dialtiazem into 100cc D5W, using a **60 drop set** and the Stat 2 pumpette extension set. Set dial on the flow meter 20ml/hr.

HOME BACK

Mixing / Dosing Chart

Treatments:

Dopamine:

Adult Dose: Advanced Treatment: (ALS) - If no response to fluid resuscitation and trauma is not suspected

Dose - 10 µg/kg/min IV/IO infusion

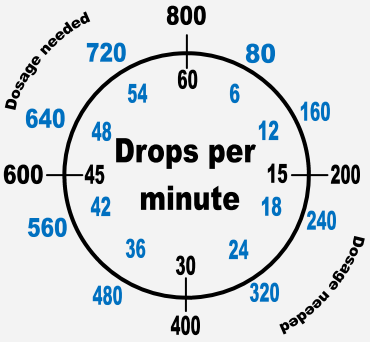
Titrate to SBP ≥ 90, signs of improvement of initial decompensation, and maximum dose of 20 µg/kg/min

	110lbs (50 kg)	121lbs (55 kg)	132lbs (60kg)	143lbs (65 kg)	154lbs (70 kg)	165lbs (75 kg)	176lbs (80 kg)	187lbs (85 kg)	198lbs (90 kg)	209lbs (95 kg)	220lbs (100 kg)	231lbs (105 kg)
10 µg/kg/min	500µg/min	550µg/min	600µg/min	650µg/min	700µg/min	750µg/min	800µg/min	850µg/min	900µg/min	950µg/min	1000µg/min	1050µg/min
15µg/kg/min	750µg/min	825µg/min	900µg/min	975µg/min	1050µg/min	1125µg/min	1200µg/min	1275µg/min	1350µg/min	1425µg/min	1500µg/min	1575µg/min
20µg/kg/min	1000µg/min	1100µg/min	1200µg/min	1300µg/min	1400µg/min	1500µg/min	1600µg/min	1700µg/min	1800µg/min	1900µg/min	2000µg/min	2100µg/min

	242lbs (110kg)	253lbs (115kg)	264lbs (120kg)	275lbs (125kg)	286lbs (130kg)	297lbs (135kg)	308lbs (140kg)	319lbs (145kg)	330lbs (150kg)	341lbs (155kg)	352lbs (160kg)	363lbs (165 kg)
10µg/kg/min	1100µg/min	1150µg/min	1200µg/min	1250µg/min	1300µg/min	1350µg/min	1400µg/min	1450µg/min	1500µg/min	1550µg/min	1600µg/min	1650µg/min
15 µg/kg/min	1650µg/min	1725µg/min	1800µg/min	1875µg/min	1950µg/min	2025µg/min	2100µg/min	2175µg/min	2250µg/min	2325µg/min	2400µg/min	2475µg/min
20µg/kg/min	2200µg/min	2300µg/min	2400µg/min	2500µg/min	2600µg/min	2700µg/min	2800µg/min	2900µg/min	3000µg/min	3100µg/min	3200µg/min	3300µg/min

Mix 400mg into 500cc 0.9% Sodium chloride. Rendering a solution of 800µg/cc.

Use a 60 drop/cc set.



Dosage needed	80	133	160	200	240	267	320	400	480	533	560
Drops per minute	6	10	12	15	18	20	24	30	36	40	42
Dosage needed	**600**	**640**	**667**	**720**	**800**	**880**	**933**	**960**	**1000**	**1040**	**1067**
Drops per minute	45	48	50	54	60	66	70	72	75	78	80
Dosage needed	**1120**	**1200**	**1280**	**1333**	**1360**	**1400**	**1440**	**1467**	**1520**	**1600**	**1680**
Drops per minute	84	90	96	100	102	105	108	110	114	120	126
Dosage needed	**1733**	**1760**	**1800**	**1840**	**1867**	**1920**	**2000**	**2080**	**2133**	**2160**	**2200**
Drops per minute	130	132	135	138	140	144	150	156	160	162	165
Dosage needed	**2240**	**2267**	**2320**	**2400**	**2480**	**2533**	**2560**	**2600**	**2640**	**2667**	**2720**
Drops per minute	168	170	174	180	186	190	192	195	198	200	204
Dosage needed	**2800**	**2880**	**2933**	**2960**	**3000**	**3040**	**3067**	**3120**	**3200**	**3280**	**3333**
Drops per minute	210	216	220	222	225	228	230	234	240	246	250

Mixing / Dosing Chart

Treatments:

Epinephrine:

Adult Dose: Advanced Treatment: (ALS) - If signs of anaphylaxis/anaphylactic shock are present

Dose - 1:10,000 - 1mg (10cc) or 1:1000 - 1mg (1cc)in 1L 0.9% NS IV/IO

Use a **10 drop set** and infuse at 1cc/minute (1mcg/minute)

Titrate to effect by increasing/ decreasing infusion rate by 1cc/min (1mcg/minute) every 1-minute

Mcg/minute	1	2	3	4	5	6	7	8	9	10
Dial a Flow (cc/hr)	60	120	180	240	300	360 N/A	420 N/A	480 N/A	540 N/A	600 N/A
Drops per minute	10	20	30	40	50	60	70	80	90	100

Pediatric Dose: Advanced Treatment: (ALS) - If signs of anaphylaxis/anaphylactic shock are present

Dose - 1:10,000 - 0.5mg (5cc) or 1:1000 - 0.5mg (0.5cc)in 500cc 0.9% NS IV/IO

Use a **60 drop set** and infuse at 0.1- 1mcg/minute

Titrate to effect by increasing/ decreasing infusion rate by 0.1cc/min (0.1mcg/minute) every 1-minute

Mcg/minute	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Drops per minute	6	12	18	24	30	36	42	48	54	60

Epinephrine:

Adult Dose: Advanced Treatment: (ALS) - For continued hypoperfusion in bradycardic patients

Dose - 1mg in 1L 0.9% NS (1mcg/cc)

Use a **10 drop set**

Infuse at 2-10 mcg/minute IV/IO

Titrate to patient response

Mcg/minute	2	3	4	5	6	7	8	9	10
Dial a Flow (cc/hr)	120	180	240	300	360 N/A	420 N/A	480 N/A	540 N/A	600 N/A
Drops per minute	20	30	40	50	60	70	80	90	100

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Mixing / Dosing Chart

Adult Treatments:

Etomidate:

Adult Dose: Advanced Treatment: (ALS) - If unable to intubate or achieve sufficient relaxation prior to intubation
Dose - 0.3mg/kg IV/IO
if insufficient sedation, consider additional doses of 0.1 mg/kg.

	110lbs (50 kg)	121lbs (55 kg)	132lbs (60kg)	143lbs (65 kg)	154lbs (70 kg)	165lbs (75 kg)	176lbs (80 kg)	187lbs (85 kg)	198lbs (90 kg)	209lbs (95 kg)	220lbs (100 kg)	231lbs (105 kg)
0.3mg/kg	15mg (7.5cc)	16.5mg (8.25cc)	18mg (9cc)	19.5mg (9.75cc)	21mg (10.5cc)	22.5mg (11.25cc)	24mg (12cc)	25.5mg (12.75cc)	27mg (13.5cc)	28.5mg (14.25cc)	30mg (15cc)	31.5mg (15.75cc)
0.1mg/kg	5mg (2.5cc)	5.5mg (2.75cc)	6mg (3cc)	6.5mg (3.25cc)	7mg (3.5cc)	7.5mg (3.75cc)	8mg (4cc)	8.5mg (4.25cc)	9mg (4.5cc)	9.5mg (4.75cc)	10mg (5cc)	10.5mg (5.25cc)

	242lbs (110kg)	253lbs (115kg)	264lbs (120kg)	275lbs (125kg)	286lbs (130kg)	297lbs (135kg)	308lbs (140kg)	319lbs (145kg)	330lbs (150kg)	341lbs (155kg)	352lbs (160kg)	363lbs (165 kg)
0.3mg/kg	33mg (16.5cc)	34.5mg (17.25cc)	36mg (18cc)	37.5mg (18.75cc)	39mg (19.5cc)	40.5mg (20.25cc)	42mg (21cc)	43.5mg (21.75cc)	45mg (22.5cc)	46.5mg (23.25cc)	48mg (25cc)	49.5mg (25.75cc)
0.1mg/kg	11mg (5.5cc)	11.5mg (5.75cc)	12mg (6cc)	12.5mg (6.25cc)	13mg (6.5cc)	13.5mg (6.75cc)	14mg (7cc)	14.5mg (7.25cc)	15mg (7.5cc)	15.5mg (7.75cc)	16mg (8cc)	16.5mg (8.25cc)

Etomidate is supplied 2mg/ml which is reflected in the above chart

Magnesium Sulfate:

Adult Dose: Advanced Treatment: (ALS) - For severe respiratory distress
Dose - 2gm in 50cc D5W over 10-15 minutes

Mix 2gm of magnesium sulfate into 50cc D5W, using a 60 drop set and the Stat 2 pumpette extension set. Set dial on the flow meter to 300ml/hr. (administering the 50cc in 10 minutes)

Mixing / Dosing Chart

Pediatric Treatments:

22 LBS (10 KG)

Medicine	Findings	First Dose
Adenosine	SVT	1mg Rapid IV
Amiodarone	V-Fib	50mg IV push
	V-Tach	50mg IV over 20 min-utes
Atropine	Bradycardia	0.2mg IV
	Organophosphate Poisoning	0.2mg IV
Calcium chloride	CCB O.D	200mg slow IV/IO
Dextrose (D25)	Hypoglycemia	20-40cc IV/IO
Diphenhydramine	Allergic Reaction	10mg IV/IO/IM
	Dystonic Reactions	10mg IV/IO/IM
Epinephrine	Bradycardia / Cardiac arrest / Newborn resusc.	0.1mg (1cc 1:10,000) IV/IO
	Severe Asthma	Infuse 1 mcg/min
Glucagon	Hypoglycemia	1 mg IM/IN
	Beta Blocker Overdose	0.7mg IV slow push
Lorazepam	Seizures	1mg IV/IO
	Sedation pacing/cardiovert	1mg IV/IO
Magnesium sulfate	Torsades	250-500 mg IV/IO over 2 minutes
	Severe respiratory distress	250-500mg in 50 cc IV over 10-15minutes
Methylprednisolone	Severe respiratory distress	20mg IV/IO
Midazolam	Seizures	1.5 mg IV/IO/IM/IN
	Sedation pacing/cardiovert	0.5-1 mg IV/IO/IN
Morphine	Pain Management	1mg IV/IO/IM
Naloxone	Opiate/Opiod O.D.	1mg IV/IO/IN
Zofran	Severe N/V	1mg IV/IM

33 LBS 15 KG

Medicine	Findings	First Dose
Adenosine	SVT	1.5 mg Rapid IV
Amiodarone	V-Fib	75mg IV push
	V-Tach	75mg IV over 20 min-utes
Atropine	Bradycardia	0.3mg IV
	Organophosphate Poisoning	0.3mg IV
Calcium chloride	CCB O.D	300mg slow IV/IO
Dextrose (D25)	Hypoglycemia	30-60cc IV/IO
Diphenhydramine	Allergic Reaction	15mg IV/IO/IM
	Dystonic Reactions	15mg IV/IO/IM
Epinephrine	Bradycardia / Cardiac arrest / Newborn resusc.	0.15mg (1cc 1:10,000) IV/IO
	Severe Asthma	Infuse 1.5 mcg/min
Glucagon	Hypoglycemia	1 mg IM/IN
	Beta Blocker Overdose	1.05mg IV slow push
Lorazepam	Seizures	1.5mg IV/IO
	Sedation pacing/cardiovert	1.5mg IV/IO
Magnesium sulfate	Torsades	375-750 mg IV/IO over 2 minutes
	Severe respiratory distress	375-750mg in 50 cc IV over 10-15minutes
Methylprednisolone	Severe respiratory distress	30mg IV/IO
Midazolam	Seizures	2 mg IV/IO/IM/IN
	Sedation pacing/cardiovert	0.75-1.5 mg IV/IO/IN
Morphine	Pain Management	1.5mg IV/IO/IM
Naloxone	Opiate/Opiod O.D.	1.5mg IV/IO/IN
Zofran	Severe N/V	1.5mg IV/IM

LEGEND	STANDING ORDERS	MEDICAL CONTROL REQUIRED

Mixing / Dosing Chart

Pediatric Treatments:

44 LBS (20 KG)

Medicine	Findings	First Dose
Adenosine	SVT	2mg Rapid IV
Amiodarone	V-Fib	100mg IV push
	V-Tach	100mg IV over 20 minutes
Atropine	Bradycardia	0.4mg IV
	Organophosphate Poisoning	0.4mg IV
Calcium chloride	CCB O.D	400mg slow IV/IO
Dextrose (D25)	Hypoglycemia	40-80cc IV/IO
Diphenhydramine	Allergic Reaction	20mg IV/IO/IM
	Dystonic Reactions	20mg IV/IO/IM
Epinephrine	Bradycardia / Cardiac arrest / Newborn resusc.	0.2mg (1cc 1:10,000) IV/IO
	Severe Asthma	Infuse 2 mcg/min
Glucagon	Hypoglycemia	1 mg IM/IN
	Beta Blocker Overdose	1.4mg IV slow push
Lorazepam	Seizures	2mg IV/IO
	Sedation pacing/cardiovert	2mg IV/IO
Magnesium sulfate	Torsades	500-1000 mg IV/IO over 2 minutes
	Severe respiratory distress	500-1000mg in 50 cc IV over 10-15minutes
Methylprednisolone	Severe respiratory distress	40mg IV/IO
Midazolam	Seizures	2 mg IV/IO/IM/IN
	Sedation pacing/cardiovert	1-2mg IV/IO/IN
Morphine	Pain Management	2mg IV/IO/IM
Naloxone	Opiate/Opiod O.D.	2mg IV/IO/IN
Zofran	Severe N/V	2mg IV/IM

55 LBS (25 KG)

Medicine	Findings	First Dose
Adenosine	SVT	2.5 mg Rapid IV
Amiodarone	V-Fib	125mg IV push
	V-Tach	125mg IV over 20 minutes
Atropine	Bradycardia	0.5mg IV
	Organophosphate Poisoning	0.5mg IV
Calcium chloride	CCB O.D	500mg slow IV/IO
Dextrose (D25)	Hypoglycemia	50-100cc IV/IO
Diphenhydramine	Allergic Reaction	25mg IV/IO/IM
	Dystonic Reactions	25mg IV/IO/IM
Epinephrine	Bradycardia / Cardiac arrest / Newborn resusc.	0.25mg (1cc 1:10,000) IV/IO
	Severe Asthma	Infuse 2.5 mcg/min
Glucagon	Hypoglycemia	1 mg IM/IN
	Beta Blocker Overdose	1.75mg IV slow push
Lorazepam	Seizures	2mg IV/IO
	Sedation pacing/cardiovert	2mg IV/IO
Magnesium sulfate	Torsades	625-1250 mg IV/IO over 2 minutes
	Severe respiratory distress	625-1250mg in 50 cc IV over 10-15minutes
Methylprednisolone	Severe respiratory distress	50mg IV/IO
Midazolam	Seizures	2 mg IV/IO/M/IN
	Sedation pacing/cardiovert	2mg IV/IO/IN
Morphine	Pain Management	2.5mg IV/IO/IM
Naloxone	Opiate/Opiod O.D.	2mg IV/IO/IN
Zofran	Severe N/V	2.5mg IV/IM

LEGEND	STANDING ORDERS	MEDICAL CONTROL REQUIRED

Mixing / Dosing Chart

Pediatric Treatments:

66 LBS (30 KG)

Medicine	Findings	First Dose
Adenosine	SVT	3mg Rapid IV
Amiodarone	V-Fib	150mg IV push
	V-Tach	150mg IV over 20 minutes
Atropine	Bradycardia	0.5mg IV
	Organophosphate Poisoning	0.6mg IV
Calcium chloride	CCB O.D	600mg slow IV/IO
Dextrose (D25)	Hypoglycemia	60-120cc IV/IO
Diphenhydramine	Allergic Reaction	30mg IV/IO/IM
	Dystonic Reactions	30mg IV/IO/IM
Epinephrine	Bradycardia / Cardiac arrest / Newborn resusc.	0.3mg (1cc 1:10,000) IV/IO
	Severe Asthma	Infuse 3 mcg/min
Etomidate	DAI	6-8mg IV/IO
Glucagon	Hypoglycemia	1 mg IM/IN
	Beta Blocker Overdose	2.1mg IV slow push
Lorazepam	Seizures	2mg IV/IO
	Sedation pacing/cardiovert	2mg IV/IO
Magnesium sulfate	Torsades	750-1500 mg IV/IO over 2 minutes
	Severe respiratory distress	750-1500mg in 50 cc IV over 10-15minutes
Methylprednisolone	Severe respiratory distress	60mg IV/IO
Midazolam	Seizures	2 mg IV/IO/IM/IN
	Sedation pacing/cardiovert	2mg IV/IO/IN
Morphine	Pain Management	3mg IV/IO/IM
Naloxone	Opiate/Opiod O.D.	2mg IV/IO/IN
Zofran	Severe N/V	3mg IV/IM

LEGEND	STANDING ORDERS	MEDICAL CONTROL REQUIRED