



## **PREHOSPITAL TREATMENT PROTOCOLS**

Effective  
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## AUTHORIZATION FOR PROTOCOLS

These protocols are issued by the Medical Direction and Practices Board (MDPB) and govern the practice of EMS licensees by the authority of 32 MRSA § 86.2-A. All health care providers in Maine involved in the EMS system and the regional EMS programs were invited to participate in the review and adoption of these protocols through their MEMS Regional Councils.

The Regional Medical Directors agree that when treatments are adopted in their regions, they will be consistent with these protocols.

The protocols will be continually reviewed. New or revised protocols will be listed on the Maine EMS website ([maine.gov/ems](http://maine.gov/ems)). The MDPB may entertain substitutions as needed for drug shortages.

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# Dedication

The Maine EMS Prehospital Treatment Protocols are dedicated to Maine's EMS providers, both past and present, as well as the numerous physicians, PAs, NPs, nurses and other medical personnel who have provided their time and guidance over the years to make the development of these protocols possible. This document reflects the planned review, which occurs every two years, by the Medical Direction and Practices Board. We attempt to combine the best available evidence from the current literature and medical consensus together to produce protocols that will enhance prehospital care in the State of Maine.

Many individuals have spearheaded the effort for this work to become a reality. Although there are too many to mention individually, it is important to realize the common commitment shared to empower a continuously improving system where those citizens who need emergency medical assistance receive the best care possible.

For those of you reading this document, please keep in mind the great commitment and sacrifice that Maine EMS providers make daily in the course of providing superlative prehospital care. Their work is physically, emotionally and mentally stressful, yet 24 hours a day, 365 days a year, these individuals provide care with the skill and compassion that promises the best prehospital care for all of the citizens of Maine. What you do matters and we thank you.



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# Preface

## LEGEND



Denotes the scope of care for the Emergency Medical Technician (EMT)



Denotes the scope of care for the Advanced Emergency Medical Technician



Denotes the scope of care for the Paramedic



Denotes a PEARL - i.e. key points/info specific to patients within the protocol



Contact On-Line Medical Control



Denotes a potentially complex patient. Please call an OLMC consult to collaborate your efforts



Denotes a pediatric specific therapy or medication dose

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These protocols are a "living document" maintained electronically by Maine EMS and may be edited or updated as required at any time. A detailed review and editing of these protocols will occur on a biennial time frame and an updated version will be released every other year.

All licensed providers who practice within the Maine EMS system are required to be familiar with the contents of this document pertinent to their level of training. For the latest corrections/updates to these protocols, please visit the Maine EMS website at: <http://www.maine.gov/ems>.

There are protocols within this document that are the result of the collaboration between the Northern New England States (Maine, New Hampshire and Vermont) to provide uniform, evidence-based care to our patients. These protocols are identified by a joint statement at the bottom of the protocol.

# Foreword

These protocols were developed for the following reasons:

1. To provide the EMS provider with a quick field reference, and
2. To develop written standards of care which are consistent throughout the State of Maine

Users of these protocols are assumed to have knowledge of more detailed and basic patient management principles found in EMS textbooks and literature appropriate to the EMS provider's level of training and licensure.

***EMS providers are encouraged to contact OLMC in any situation in which advice is needed, not only in situations as directed by these written protocols.***

To use these protocols as they are intended, it is necessary to know the philosophy, treatment principles, and definitions which guided the physicians and other EMS providers who drafted these protocols:

- **Treatment should very RARELY delay transport!** This is especially true for trauma patients, patients with chest pain and patients with suspected stroke. IVs should be started en route except in those situations where treatment at the scene is in the patient's best interest, such as shock, prolonged extrication, or a cardiac patient when full ACLS care is available. Delays in transport should be discussed with OLMC.
- **Inability to establish voice contact with OLMC:** There are rare situations where the patient is unstable and delay in treatment threatens the patient's life or limb. If, after good faith attempts, the EMS provider cannot contact OLMC, then the EMS provider is authorized to use any appropriate treatment protocols as if they were standing orders. In such cases, treatments must still be consistent with the EMS provider's training and licensure. Continue attempts to contact OLMC and document these attempts on the patient run record.
- **Transports and transfers:** During transports and transfers, ambulance crews will follow these MEMS protocols, including use of only those medications and procedures for which they are trained and authorized by protocol.
- **Hospital destination choice:** If a patient needs care which the ambulance crew, in consultation with OLMC, believes cannot be provided at the most accessible hospital, the patient will be transported to the nearest facility capable of providing that care upon the patient's arrival. If, with OLMC consultation, a patient is believed to be too unstable to survive such a diversion, then the patient will be transported to the most accessible hospital with an emergency department. Diversion is also non-binding, and if a patient insists or if the crew deems that bypass is not in the patient's best interest, then going to a hospital "on diversion" is appropriate. If OLMC contact is not possible, the ambulance crew is authorized to make this determination. OLMC cannot legally refuse these patients.

# Foreword

- **Regional destination:** Each region has the authority to develop protocols which designate the appropriate destination for patients transported from the scene. Any such protocol should be patient-centric and created exclusively to offer patients emergent care only available at selected regional sites. Examples of such protocols include the Maine EMS Trauma Triage Protocols.
- **Treatments/medications should be given in the order specified.** However, the MDPB recognizes that often treatments are delivered simultaneously and more than one protocol may be used. OLMC or Advanced Providers may request treatments/medications out of sequence for medical reasons.
- **MEMS patient/run record** will be legible and thoroughly completed for each call or for each patient when more than one patient is involved in a call. This document is our legacy of patient care and holds valuable information for hospital providers. This information is essential to patient care and safety. Services must provide a patient care document before leaving the hospital. In MOST circumstances, this document will be a completed copy of the patient run report, although, in rare circumstances, when it is not possible to complete the electronic patient care record before leaving the hospital, services may provide the hospital with a Maine EMS-approved, one page, patient care summary. THIS DOCUMENT DOES NOT REPLACE THE COMPLETED RUN REPORT. These documents may become part of the patient's hospital record and, in an effort to ensure excellent patient care, all information on this written summary must reflect the information in the electronic run report. Services must still complete the electronic patient care report and make the report available to the hospital as soon as possible.
- **Quality Assurance:** All EMS providers and services must be in compliance with the Regional and State Quality Improvement Program to the satisfaction of the Regional Medical Director.
- **Assuming and Reassessing care already provided:** EMS providers who will be assuming the responsibility for patient care will also be responsible for assessing the care provided before their arrival, and for all subsequent care after they arrive up to and including their level of training and licensure. If an EMS provider has not been trained in a particular treatment listed at their level, or if that treatment is not within the EMS provider's scope of practice, the provider may not perform the treatment.
- **If there is a Paramedic on scene that is willing to:**
  - a. Accompany the AEMT on the call, and
  - b. Accept responsibility for the AEMT's actions

Then the Paramedic may direct the AEMT to administer medications that are within the AEMT's scope of practice. This may be accomplished without contacting OLMC as long as the medication administration would not require OLMC for the Paramedic. If the Paramedic is unwilling to accept the above responsibilities, then the AEMT must contact OLMC before administering any medications.

# Foreword

- **Defibrillation:** Advanced EMTs are expected to follow these protocols within the limitations of the monitor/defibrillator available to them.
- **Carbon monoxide monitors:** Carbon monoxide monitors may be used for informational purposes only. Treatment and transport decisions may not be made solely on the basis of CO readings from these monitors as they may report falsely low levels.
- **Medical Control permission:** If a treatment is listed as requiring Medical Control permission at one level and is listed again without requiring OLMC permission at a higher level, the higher-level EMT need not seek OLMC permission.
- **Deviation from protocols:** These protocols represent a consensus of the MDPB. In unusual situations, OLMC may deviate from these protocols if done in the patient's best interest. The deviation in care ordered must be within the scope of practice, training and skill of the EMS provider. The reasons for deviating from these protocols must be documented in the patient's chart. Under such circumstances, if the ALS provider agrees, the ALS provider will verify and will comply with OLMC orders, will fully document the deviation on the patient run record, and will not consider the care rendered to be an emergency medical treatment to be routinely repeated.
- **Arrival of officially dispatched EMS personnel:** Once EMS personnel have arrived on the scene, they may interact with other medical personnel on the scene who are not part of the organized EMS system responses in the following manner:
  - **Maine EMS licensees not affiliated with one of the responding services may only provide care within their scope of practice with the approval of the ambulance crew-member in charge of the call.**
  - **The patient's own physician,** physician assistant, or nurse practitioner may direct care as long as they remain with the patient (in their absence, direction of care is subject only to these protocols and OLMC). You may assist this person within the scope of your practice and these protocols. Only a physician, physician assistant, or independent nurse practitioner authorized to offer OLMC by their hospital may give orders outside of the MEMS protocols. Questions in this regard should be resolved by OLMC. You may show this person **Black 1**, the "Non-EMS System Medical Interveners" protocol to assist with your explanation.
  - **Other unsolicited medical interveners** must be Maine licensed physicians, nurses, nurse practitioners or physician assistants whose assistance you request. The **Black 1** "Non-EMS System Medical Interveners" protocol describes this, and should be shown to such interveners.
  - **Other healthcare providers in the home:** Other healthcare providers in the home attending the patient (i.e. R.N., L.P.N., C.N.A., Nurse Midwife, etc.) are a valuable source of information and assistance. Any aid or treatment they wish to give must be authorized by OLMC. Any dispute over treatment or transport should be resolved by OLMC.

# Foreword

- **Home healthcare devices and appliances:** Patients may have devices and appliances (drains, ports, LVAD, insulin pumps, etc.) with which they are routinely discharged home. Patients (or their licensed care providers or previously instructed family members), are expected to maintain them on their own. These devices have some risks associated with them, but are generally considered safe in the home environment. As such, EMS providers are not restricted in the care or transfer of these patients based solely on the presence of these devices or appliances. **If an issue arises where there is unfamiliarity with or any questions concerning these devices (which cannot be immediately resolved by the patient or caregivers), refer to OLMC.**
- **Graduates with a current certification from a Maine EMS-approved wilderness EMT course** may apply the principles of care taught in that course with the approval of the service Medical Director and when patient arrival at a definitive care setting will be more than 2 hours.
- **Repeated Treatment:** Unless otherwise indicated, any treatment included in these protocols may be repeated after reassessment and with OLMC permission.
- **External Pacing** (where indicated in these protocols) should be performed if a pacer is available.
- **Oxygen supplementation** will be by nasal cannula or non-rebreather mask as appropriate.
- **Patient Sign-Offs:** There exist three origins for patient sign-offs:
  - a. A patient refuses transport and the provider agrees transport is not warranted
  - b. The patient refuses transport but the provider does not feel this is safe
  - c. The patient requests transport but the provider refuses (this final example is called an EMS System-initiated sign-off)

Patient-initiated sign-offs should only be considered in patients with decision-making capacity and resources available to care for themselves and when non-transport is considered safe. These sign-offs do not require discussion with On-Line Medical Control. Situations in which the patient requests sign-off but the EMS provider deems it inappropriate, please refer to OLMC. **EMS System-initiated patient sign-offs (i.e.: when the patient requests transfer but the EMS provider refuses) are tremendously risky interactions and are not permissible. These sign-offs must be approved by OLMC and the service is expected to review all of these events through the service's quality assurance mechanism. Patient medical records must be completed for all of these interactions.**



# Foreword

- **Maine EMS Special Circumstance Protocols:** Maine EMS protocols are intended to address the vast majority of medical emergencies encountered by an EMS provider. While intended to be comprehensive, certain patients exist with rare medical conditions that require highly specialized emergent care. In such situations, Maine EMS has created the “Special Circumstance Protocols”. These are prearranged medical protocols specialized to individual patients, suggested by the patient’s medical provider and ratified by the MDPB. Patients will present with a “Maine EMS Special Circumstance Protocol Form” that outlines the patient’s individual protocol and is signed by the patient’s physician, the patient or their guardian, the local EMS service chief, the Regional Medical Director, and the State of Maine EMS Medical Director. These Special Circumstance Protocols should be made known to local EMS services and providers. In cases of question or uncertainty regarding the nature of the protocol, please refer to OLMC.
- **During transport,** patients should be secured to the stretcher utilizing both lateral and shoulder straps.
- **Paramedics and AEMTs** are expected to perform all duties in their listed scope of practice as well as those of the prior scopes of practice in the appropriate logical order.
- **Vagus Nerve Stimulators (VNS)** are implanted devices that are used to treat refractory partial seizures by stimulating the vagus nerve. They are not currently approved to treat generalized seizures. The exact mechanism is unclear but the devices provide continuous on-off cycles of vagal stimulation to prevent seizures. Patients with a VNS typically have a magnet that they can use to trigger an additional 30 second stimulation period when they feel a seizure coming on or when they are having a seizure. Caregivers are typically trained to assist with the magnet. In the event no one is available who is trained to use the magnet, the EMS provider at any level may assist the patient if the patient can confirm that the device is a VNS and after the EMS provider consults with OLMC.
- **In the critically ill patient,** vascular access may be difficult to obtain. The decision on which technique to use first, IV versus IO, is based on the assessment and judgment of the provider. Ultimately, an IV is the superior form of vascular access but the IO is appropriate for the initial resuscitation of the critically ill patient if, in the provider’s judgment, attempts to obtain IV access would lead to an unreasonable delay in initiating fluid resuscitation.
- **Option to Cancel ALS policy:** If the patient meets the protocol-specific cancellation criteria, the EMT and AEMT, in consultation with OLMC, may determine that it is appropriate to cancel the ALS response based on transport time, patient co-morbidities, and any other applicable factors.
- **All equipment** referenced in these protocols must be “Maine EMS-Approved.” In addition, it is expected that all providers will be appropriately trained before using any piece of equipment, device, or technique.



# Foreword

## TASER PROBES

The use of a TASER does not automatically necessitate an EMS response or involvement. In assessing such patients, be cognizant of the potential for underlying metabolic dysfunction. TASER probes may be removed from the subject by the deploying officer. Probes that are embedded in a sensitive area (i.e. face, neck, breast, and genital area) may need to be removed by medical personnel. In these cases, the subject should be transported to the hospital for examination and removal of the probes by medical personnel at the hospital. Other adverse affects, (i.e. respiratory difficulty, seizures, etc.) should be treated as appropriate by the applicable protocol(s).

For Historical Purposes Only

# Definitions

**ACLS** is Advanced Cardiac Life Support.

**Advanced Airway** means the skill of endotracheal intubation and use of other airway modalities such as Blind Insertion Airway Devices (BIAD) performed only by those who have completed practical training in each of these skills.

**AEMT** (Advanced EMT) means the ability to provide Advanced EMT level of care (previously called Intermediate EMT).

**AHA** is the American Heart Association

**ALS (Advanced Life Support)** means the ability to provide advanced level of medical care, which in the prehospital realm means *Paramedic*. The ALS skills may include the following: IV access, advanced airway, cardiac monitoring, and/or oral or parenteral medications.

**ALS (Advanced Life Support), If Available** means that the patient shall receive the highest appropriate ALS intervention as soon as possible. The decision in this realm as to which interventions may be appropriate rests with the Paramedic. If any skills other than basic life support are deemed necessary or initially implemented, an ALS response should be sought, with simultaneous dispatch if possible. The use of a medical priority dispatching program, approved by the State Medical Director, is encouraged. When this cannot happen, the crew in attendance should bring ALS care and the patient together in the fastest of three ways: (1) ALS back-up at the scene; (2) ALS back-up met en route; or (3) ALS by hospital staff in the emergency department if prehospital rendezvous is not possible.

The BLS providers on the scene may modify the ALS response as appropriate.

**BP** in these protocols refers to the systolic blood pressure.

**Continuous Nebulization** is administration of 3 unit doses of albuterol or albuterol-ipratropium without interruption; that is, put all 3 unit doses into the nebulizer at the same time (if volume allows) and administer until complete OR administer 1 unit dose x 3 without waiting between administrations.

**Emergency Department** means a hospital that provides an organized Emergency Service or Department that is available twenty-four (24) hours a day, seven (7) days a week and has the capability to provide On-Line Medical Control, to evaluate, treat, stabilize, and refer to an appropriate outside resource for all persons who present themselves for treatment.

# Definitions

## Emergency Medical Responder

The MDPB recognizes the Emergency Medical Responder (EMR) scope of practice to include the following:

- a. Airway management, including manual maneuvers, suctioning, application of supplemental O<sub>2</sub>, and use of the following airway adjuncts - pocket mask, OPA/NPA, BVM
- b. Acquisition of manual vital signs
- c. Application of medications for force protection only (such as the Mark 1 kit)
- d. Performance of manual CPR and use of AED
- e. Assistance in childbirth
- f. Manual stabilization of the cervical spine or extremity injuries
- g. Hemorrhage control, including use of a tourniquet
- h. Emergency patient moves (such as drags, carries, etc.)
- i. Provision of naloxone for suspected overdose

The Maine EMS EMR may practice within this scope of practice to include these skills.

**EMS Provider** means any person or service licensed by Maine EMS to provide emergency medical services.

**End-tidal CO<sub>2</sub> (ETCO<sub>2</sub>)** is a measurement of carbon dioxide in exhaled air used to assess ventilation, also referred to as capnography. The capnography monitoring must be *continuous* and with a device that displays a waveform.

**Fluid Bolus** indicates maximum fluid administration achievable without pumps or other special equipment in the field setting. Specifically, running a large bore IV wide open until the desired clinical condition or blood pressure, based on the patient's underlying condition, is achieved. A true IO bolus, at the appropriate dose with a syringe/3-way stop-cock assembly or pressure bag, is acceptable. Pediatric boluses are 20 mL/kg, and may be repeated one time if patient remains hypotensive, unless a specific alteration is noted in the protocols. Unless a specific volume of fluid is specified in the specific protocol, if the patient requires more than 40 mL/kg of IV fluid, contact OLMC to further guide fluid administration.

**Hypoglycemia** is a blood glucose less than 60 mg/dL.

**IO** in these protocols, means intraosseous access. IO may be used by the Advanced EMT or Paramedic. The IO route should be considered in any patient if an IV is not established within two attempts or 90 seconds and that patient has one of the following:

- a. Altered mental status (GCS less than or equal to 8)
- b. Respiratory failure (SpO<sub>2</sub> less than or equal to 90% after appropriate oxygen therapy, respiratory rate less than 10 or greater than 40 breaths per minute) with alteration of mental status
- c. Profound hypovolemia or hemodynamic instability with alteration of mental status or other evidence of shock – recall, the use of an IO for volume resuscitation requires the use of a pressure bag/3-way stop-cock to achieve optimal flow rates
- d. Cardiac arrest (medical or traumatic)

(Continued on next page)

# Definitions

(continued)

Additionally, the provider may choose to utilize the IO route first in critical patients for whom IV access may be difficult.

After discussion with OLMC, may consider IO placement for the following conditions:

- a. Profound hypovolemia (Systolic BP less than 90 mmHg) without alterations in mental status or other evidence of shock
- b. Burn patients with bilateral upper extremity burns

\*IO is CONTRAINDICATED in the following conditions

- a. Fracture of the tibia or femur in lower extremity placement or fracture of the humerus in upper extremity placement
- b. Infection at insertion site
- c. IO within the prior 24 hours in the same bone
- d. Knee or shoulder replacement (identified by midline vertical scar over the patella or anterior proximal humerus)
- e. Tumor near site
- f. Inability to locate landmarks
- g. Excessive tissue at insertion site
- h. IO access is not intended for prophylactic use

Approved Sites (one per bone): Per manufacturer recommendations. Consider humeral head placement preferentially due to proximity to central circulation, particularly in OHCA patients.

Paramedic: If infusion of medications or fluids causes significant pain, consider the following:

1. Adult: Consider lidocaine 2% (preservative free) 40 mg slow push followed by 10 mL Normal Saline flush. If pain continues, contact OLMC for OPTION of additional 20 mg bolus
2. Pediatric: Consider lidocaine 2% (preservative free) 0.5 mg/kg (MAX 40 mg) slow push followed by 10 mL Normal Saline flush. If pain continues, contact OLMC for OPTION of additional 0.25 mg/kg (MAX 20 mg) slow push

**IV** means any balanced electrolyte solutions may be used, such as Lactated Ringers, Normal Saline and 5% Dextrose in Water. IV solutions, as defined in this document, DO NOT include other additives (such as potassium) or medications. Normal Saline is the fluid of choice for patients with history of renal failure, not Lactated Ringers.

Recommended catheter size for rapid fluid resuscitation in adults is 14-18 gauge. If rapid fluid resuscitation is not required, smaller catheter sizes and heparin/saline locks may be used. Heparin used for this procedure is not considered a medication.

**MDPB** means Maine EMS Medical Direction and Practices Board, which consists of the six Regional Medical Directors, a physician representing the Maine Chapter of the American College of Emergency Physicians, an At-Large physician representative, a Clinical Pharmacist or Toxicologist, the State Assistant EMS Medical Director and the State EMS Medical Director.

**Neonate** is an infant less than or equal to 28 days old.

# Definitions

**NR** means a non-rebreather oxygen mask.

**O<sub>2</sub>** means oxygen therapy as appropriate for patient.

**On-Line Medical Control (OLMC)** refers to the on-line physician/physician assistant/nurse practitioner who is licensed by the State of Maine and authorized by a hospital to direct emergency medical services personnel consistent with the protocols developed by the MDPB.

**Other Appropriate Destination** means a facility that has been approved by the Board of EMS to receive, via ambulance, patients who are in need of emergency care.

**Paramedic Back-up** means use of an Advanced Life Support resource when a presenting patient needs more than Basic Life Support. In the prehospital setting, this indicates a *Paramedic* response. An ALS back-up agreement should be written between EMS provider services routinely offering and accepting ALS back-up support. This would establish medical/operational/ liability expectations of both services. These protocols cannot mandate any service to routinely offer or receive back-up. However, any decision in this regard, particularly to refuse to offer or accept ALS back-up, should be grounded in reasonable medical, operational, or financial considerations and should be reviewed by the individual service's legal counsel.

**Pediatric Patient** in these protocols, means pre-pubertal (without pubic, axillary, or facial hair).

**PPV** is Positive Pressure Ventilation, such as (in order of preference): two-person bag-valve-mask technique with oxygen, one-person bag-valve-mask technique with oxygen, mouth-to-mask ventilation with oxygen, and mouth-to-mask ventilation without oxygen.

# Maine EMS Statement on “Rescue” or “Alternate” Airway Devices

Maine EMS recognizes 2 major classes of Blind Insertion Airway Devices (BIADs). The first class is periglottic devices, such as the LMA® and the second class is transglottic or potentially transglottic devices, such as the King LT®. Any FDA-approved devices from these classes are approved for use.

A c-spine collar should be considered to help protect placement of all endotracheal intubations, periglottic and transglottic airway devices.

There are periglottic devices on the market that can be used to facilitate endotracheal intubation. If these devices are placed without an attempt at endotracheal intubation, they may be treated as any other periglottic device. If they are used to assist in placing an endotracheal tube, that tube must be treated and confirmed as any other endotracheal intubation.

It is recommended to have *NO MORE THAN* one device per class (periglottic or transglottic).

For Historical Purposes Only

# Pre-Intubation Checklist

## 1. Airway adjuncts ready

- ☐ Suction
- ☐ Oropharyngeal airway/ 2 nasopharyngeal airways
- ☐ Nasal cannula for apneic oxygenation

## 2. Intubation equipment ready

- ☐ Laryngoscope assembled and functional
- ☐ ET tube ready with lubricant, bougie and syringe
- ☐ Tube-securing device ready
- ☐ Continuous end-tidal CO<sub>2</sub> monitor ready
- ☐ OG Tube

## 3. Back-up equipment ready

- ☐ Blind Insertion Airway Device (i.e. LMA®, iLMA®, or King®) available
- ☐ Consider surgical airway device

## 4. Team ready

- ☐ Airway manager
- ☐ BVM operator
- ☐ Assistant

## 5. Plan discussed

## 6. Patient ready

- ☐ Pre-oxygenation/de-nitrogenation
- ☐ Vascular access
- ☐ Patient positioning (unless contraindicated)
  - ☐ Ear-to-Sternal-Notch
  - ☐ 30 degree head-of-bed elevation
- ☐ Monitoring in place
- ☐ Evaluate airway difficulty
- ☐ Prep for surgical airway as needed

## 7. Post-intubation medications ready

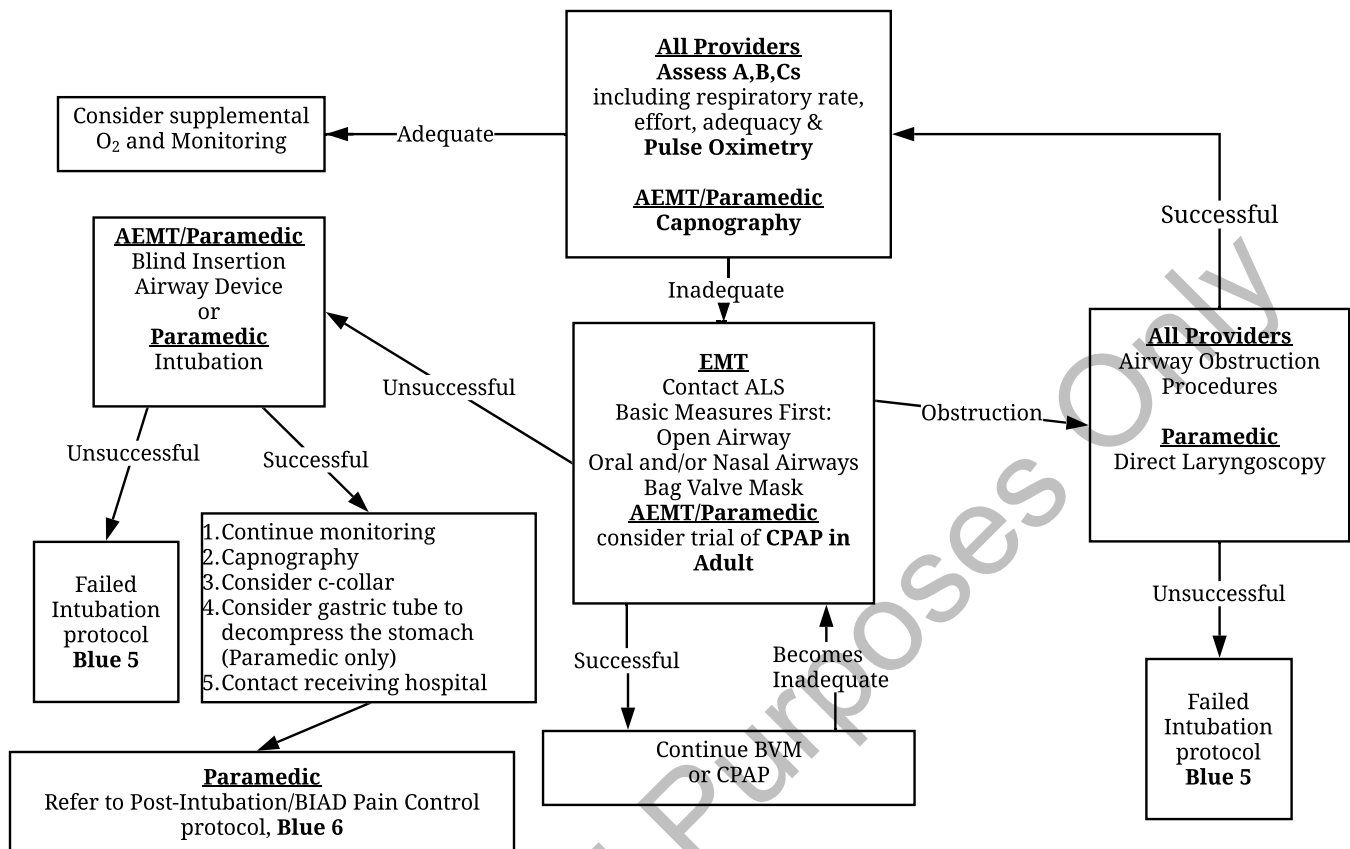
- ☐ Pain control:
  - ☐ fentanyl
- ☐ Sedation (\*requires OLMC\*):
  - ☐ midazolam **OR** ☐ ketamine

## 8. Automatic ventilator settings (if available)

- ☐ Volume: 6-8 mL/kg
- ☐ Rate: 16 (10 in asthma/COPD)



# Airway Algorithm



- An intubation attempt is defined as passing a bougie or the endotracheal tube past the teeth or the endotracheal tube inserted into the nasal passage.
- Continuous capnography is **mandatory** for all patients with a BIAD or Endotracheal Tube; if prolonged use of BVM, consider use of capnography.
- The goal of airway management is adequate oxygenation, ventilation, and airway protection. If an effective airway is being maintained by BVM with an OPA and/or NPA(s), it is acceptable to continue with basic airway measures rather than BIAD or intubation.
- Consider addition of high-flow nasal cannula in addition to BVM/face-mask prior to intubation attempt if not meeting oxygenation goals. Keep in place during intubation attempt.
- The gastric tube may be connected to low suction (less than 80 mmHg).

## **Patients are more effectively ventilated with face-mask ventilation when:** **PEARLS for Endotracheal Intubation**

1) A two-person ventilation technique is used

2) ETCO<sub>2</sub> is used to guide ventilation

3) Avoiding hypo- and hyperoxia

4) Avoiding hypo- and hyperventilation

5) Minimizing peak airway pressure

6) When tolerated, both oral and nasal airways are placed

\*\*Face mask ventilation can be achieved with a transport vent if so trained (Adult only)\*\*

\* Position the airway for best view of the cords – raise head to the sniffing position (i.e. earlobe in-line with sternal notch)

\* Preparation: (four cornerstones)

1) ET tube

2) Laryngoscope with backup blade

3) Suction

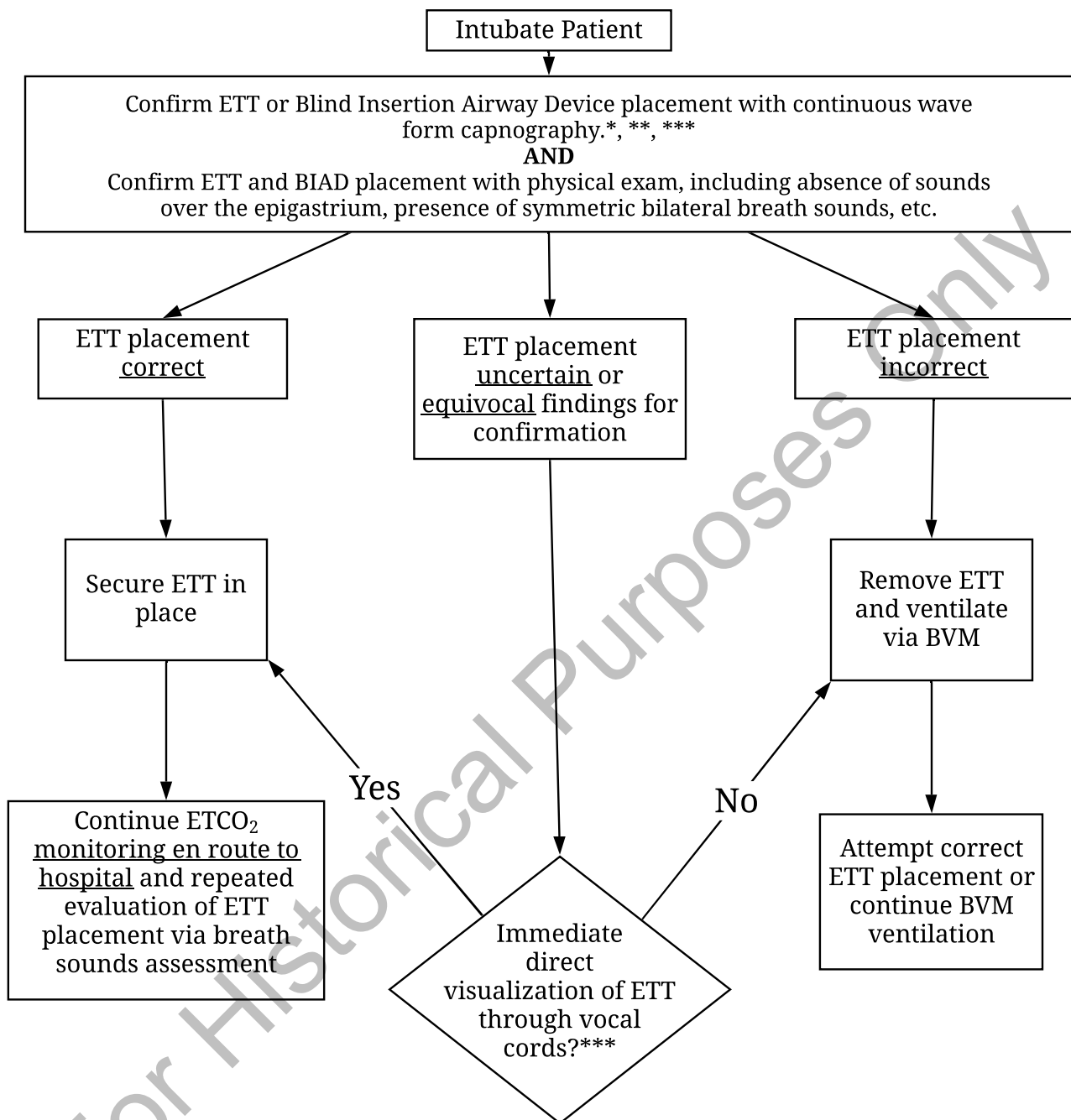
4) Bougie on every attempt

**\* Always have a back-up plan should the primary strategy fail\***

**\*When advanced airways are placed, secure the tube with either a commercial tube holder or tape, rather than held manually\***



# Confirmation and Monitoring of Advanced Airways

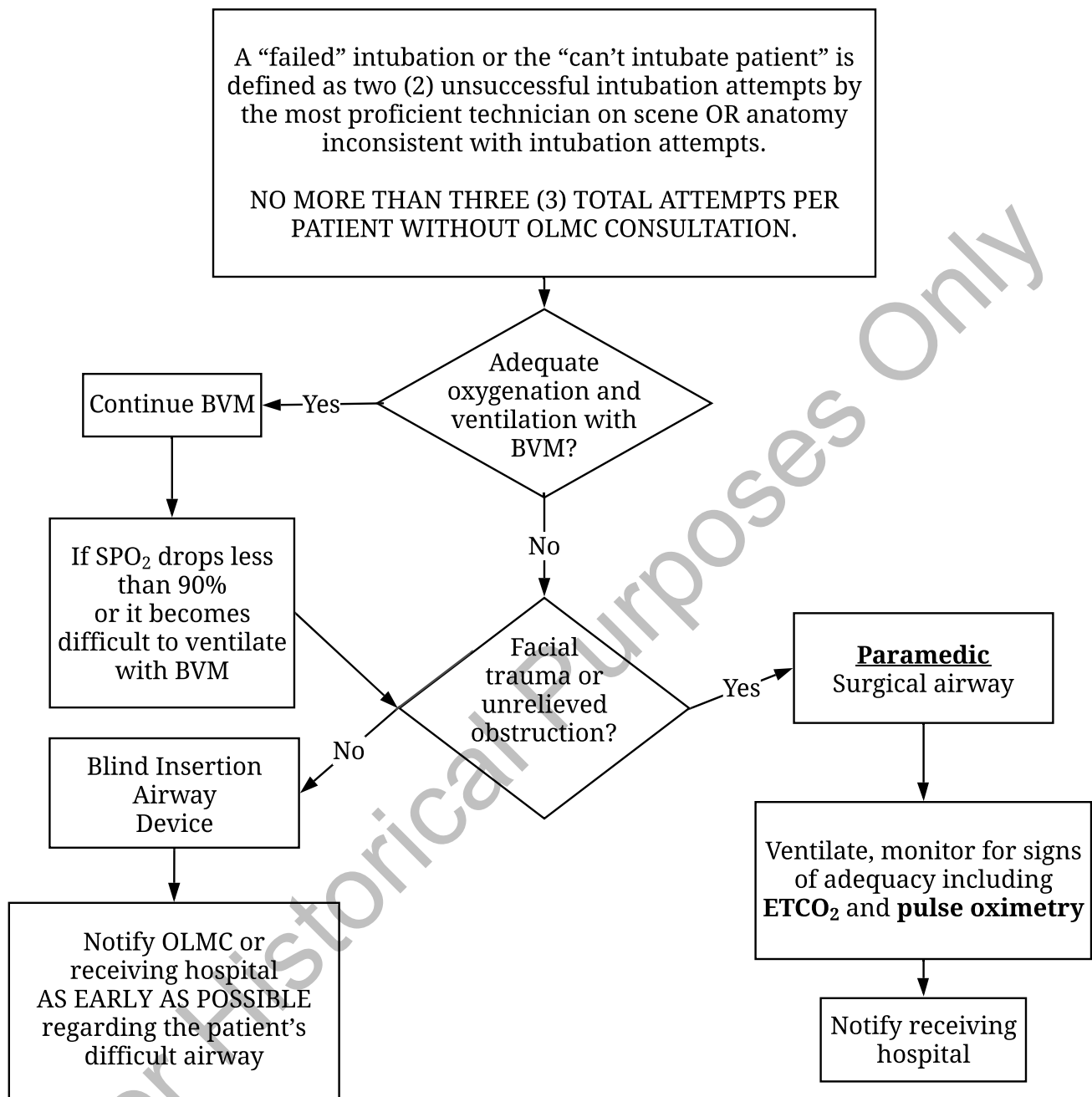


\* For cardiac arrest patients, consider placement of the ETT as well as lack of pulmonary circulation in the interpretation of ETCO<sub>2</sub> findings.

\*\* Depending on the device used, ETCO<sub>2</sub> devices may not be applicable to the pediatric patient.

\*\*\* Nasotracheally-intubated patients should be assumed to have incorrect ETT placement if findings of breath sounds or ETCO<sub>2</sub> results are uncertain or equivocal

# Failed Intubation Algorithm



Continuous pulse oximetry and ETCO<sub>2</sub> monitoring should be utilized in all patients with difficult airways or respiratory distress.

FOR PEDIATRIC PATIENTS REQUIRING SURGICAL AIRWAY – Consider needle cricothyrotomy in patients less than 10 years old OR if physiologically young enough that surgical landmarks are NOT identifiable.



# Post-Intubation/BIAD Pain Control

**E** All patients with an ETT or BIAD inserted who are **not** currently in cardiac arrest are at risk for pain, anxiety and self-extubation. Therefore, appropriate pain control and anxiolysis are required for all intubated patients. Signs of inadequate pain control/sedation include eye opening, coughing or gagging, sweating, tearing, new or worsening hypertension and/or tachycardia, tachypnea, or attempts to self-extubate.

## **EMT**

1. Minimize stimulation

## **A** **ADVANCED EMT**

2. Place IV for anticipated medication administration

## **PARAMEDIC**

3. Pain control

- a. **Adult & Pediatric:** Fentanyl 0.5 - 1 mcg/kg **IV/IO** every 15 minutes to a MAX cumulative dose of 5 mcg/kg



4. Anxiolysis - Contact **OLMC** for **ONE** of the following options:



- a. Midazolam

- i. **Adult:** 0.5 - 2.5 mg **IV/IO** every 5 minutes, may repeat x 3 to a MAX cumulative dose of 5 mg OR 1-5 mg **IM** every 5 minutes, may repeat x 3 to a MAX cumulative dose of 10 mg

- ii. **Pediatric:**

1. **6 months - 5 years:** 0.05 - 0.1 mg/kg **IV/IO** every 5 minutes to a MAX cumulative dose of 5 mg
2. **6 years - 12 years:** 0.025 - 0.05 mg/kg **IV/IO** every 5 minutes to a MAX cumulative dose of 5 mg
3. **6 months - 12 years:** 0.1 - 1.5 mg/kg **IM** (MAX single dose 5 mg) every 5 minutes to a maximum cumulative dose of 10 mg



**-OR-**

- b. Ketamine (Adult ONLY)

- i. 0.2 mg/kg **IV/IO**, max single dose of 25 mg, may repeat x 1 in 5 minutes
- ii. 0.4 mg/kg **IM**, max single dose 50 mg, may repeat x 1 in 10 minutes

It is important to **avoid** hypotension in the critically ill patient, especially post cardiac arrest and head injury. Since anxiolytics (midazolam and ketamine) can cause significant hypotension, it is recommended to treat pain first and anxiolysis (if needed) second. Anxiolysis should be treated with **either** midazolam **OR** ketamine, not a combination of the two as this could cause profound hypotension.

# Respiratory Distress with Bronchospasm #1

## (COPD, Emphysema, Chronic Bronchitis, Asthma)

**CAUTION: RESPIRATORY DISTRESS MAY BE DUE TO MULTIPLE OTHER CAUSES FOR WHICH OTHER TREATMENTS MAY BE INDICATED, INCLUDING THE FOLLOWING:**

Pulmonary Edema, see **Blue 11**

Anaphylaxis, see **Gold 1**

Chest Trauma, see **Green 10**

### E EMT

1. O<sub>2</sub> as appropriate
2. If needed, assist ventilations with positive pressure ventilation using 100% O<sub>2</sub>
3. Request ALS

---

4. For EMT level providers – assist with self-administered bronchodilator inhaler. Tell OLMC the name of the inhaler. OLMC will prescribe number of puffs

### ADVANCED EMT

5. Cardiac monitor
6. Manage airway as needed, refer to **Blue 3**

---

7. Contact OLMC to administer albuterol, 2.5 mg by nebulization (use 3 mL premix or 0.5 mL of 0.5% solution mixed in 2.5 mL of normal saline)

---

8. Consider CPAP in patients > 18 y/o.

### A

Recall that CPAP should *never* take the place of bronchodilators and should be used only **after**, or in concert with, inhaled bronchodilators in patients with acute bronchospasm. If CPAP is going to be used in the asthmatic, continuous nebs *must* be administered *simultaneously*\*

9. For asthma only:
  - a. Continuously nebulized albuterol if on CPAP
  - b. Epinephrine (this is second-line for paramedics who should give Mag Sulfate first)
    - a. **Adult** – EPINEPHrine 0.3 mg **IM** of 1mg/1mL every 20 minutes
    - b. **Pediatric** - EPINEPHrine dose which is as follows: < 25 kg, 0.15 mg **IM** [0.15mL of 1mg/mL], > 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh every 20 minutes

### PARAMEDIC

#### 10. Adult/Pediatric

- a. Albuterol 2.5 mg by nebulization. May repeat 1 time; **or**
- b. Ipratropium bromide 0.5 mg / albuterol sulfate 2.5 mg nebulizer if greater than one (1) year of age and in continued respiratory distress. May repeat one time

# Respiratory Distress with Bronchospasm #2

## (COPD, Emphysema, Chronic Bronchitis, Asthma)

### 11. Dexamethasone

**Adult:** 10 mg **IV/IM/IO** x 1

**Pediatric:** 0.6 mg/kg (single MAX dose of 10 mg) **IV/IM/IO** x 1



### 12. Consider the following OPTIONS:

a. Repeated or continuous albuterol by nebulization or inhaler.

b. For patients in status asthmaticus



i. Magnesium Sulfate

1. **Adult:** Magnesium Sulfate 2 grams **IV/IO** over 10 minutes, consider placing this medication on a pump.

2. **Pediatric:** Magnesium Sulfate 50 mg/kg **IV/IO** with a MAX dose of 2 grams over 10 minutes; consider placing this medication on a pump.



ii. Epinephrine

1. **Adult:** EPINEPHrine 0.3 mg **IM** of 1mg/1mL every 20 minutes

2. **Pediatric:** EPINEPHrine dose which is as follows:

Less than 25 kg, 0.15 mg **IM** [0.15mL of 1mg/mL],

Greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh every 20 minutes



P

#### \*Asthmatic patients:

Airway management of asthmatic patients is primarily pharmacological, not mechanical. Therefore, the focus should be on taking those actions that enable the provider to provide inhaled bronchodilators and, in patients with severe bronchospasm, obtain rapid IV or IO access, administer IV dexamethasone, IV magnesium, and consider **IM** EPINEPHrine. Due to the pathophysiology of asthma, positive pressure ventilation (facemask, BIAD, or endotracheal intubation) rarely, if ever, is an effective treatment without pharmacological intervention. Therefore, unless the patient is apneic, provide supplemental oxygen via non-rebreather and focus on providing pharmacological interventions. CPAP, with the lowest PEEP setting possible, is a last resort and a bridge to intubation. Specifically, if CPAP is going to be used in the asthmatic, continuous nebs *must* be administered *simultaneously* and the provider must be prepared to intubate this patient.

# Respiratory Distress with Bronchospasm #3

## (COPD, Emphysema, Chronic Bronchitis, Asthma)

### Pediatric Considerations:



Wheezing in the child less than 2 years old is very commonly due to bronchiolitis. Bronchiolitis is a self-limited viral illness of the bronchioles, marked by edema but not smooth muscle contraction. Bronchiolitis is the most common cause of wheezing in children under the age of 2. The treatment goals are to maintain oxygenation and hydration and to monitor for apnea and respiratory distress. Because the etiology is different than asthma, the treatment options are also very different. Patients suffering from bronchiolitis **do not always benefit from inhaled albuterol, though a trial is appropriate. They also do not benefit from intravenous steroids.** Instead, provide oxygen to ensure  $O_2$  sats greater than or equal to 90% and nasal suctioning with bulb syringe. Patients who fail these measures or decompensate may benefit from nebulized epinephrine. Monitor for apnea or respiratory distress and, if encountered, manage the patient's airway as indicated per **Blue 3**.

Prehospital providers should consider patient age, diagnosis, transport time, provider experience, and effectiveness of ongoing bag-mask ventilation in considering whether to continue with bag-mask ventilation versus proceeding to further airway management procedures. Bag-mask ventilation has been shown to be equivalent to endotracheal ventilation in pediatric patients in most situations with short transport times. If suspected opiate overdose, refer to the Poisoning/Overdose protocol, **Yellow 1**.

# Anxiolysis in CPAP

E A

Adult patients with respiratory failure who are unable to oxygenate and ventilate often require CPAP. These patients may be combative and unable to tolerate CPAP either due to their hypoxia or anxiety.

## EMT/Advanced EMT/Paramedic

1. Attempt coaching

## PARAMEDIC

2. Consider ondansetron 4 mg **IV/IO/IM** if CPAP causing nausea and bloating

3. If unable to achieve sufficient anxiolysis to tolerate CPAP with coaching, contact **OLMC** for for **ONE** of the following anxiolytics:

- a. Midazolam

- i. 0.5 - 2.5 mg **IV/IO** every 5 minutes, may repeat x 3 to a MAX cumulative dose of 5 mg
- ii. 1-5 mg **IM** every 5 minutes, may repeat x 3 to a MAX cumulative dose of 10 mg

-OR-

- b. Ketamine

- i. 0.2 mg/kg **IV/IO**, MAX single dose of 25 mg, may repeat x 1 in 5 minutes
- ii. 0.4 mg/kg **IM**, MAX single dose 50 mg, may repeat x 1 in 10 minutes

P





# Pulmonary Edema (without shock)

**Avoid nitroglycerin in any patient who has used a phosphodiesterase inhibitor within the past 48 hours. Examples are: sildenafil (Viagra, Revatio), vardenafil (Levitra, Staxyn), tadalafil (Cialis, Adcirca) which are used for erectile dysfunction and pulmonary hypertension. Contact OLMC for options in patients who have taken such medicines.**

**E** If initial systolic BP is less than 100 mmHg, refer to "Cardiogenic Shock" protocol, **Red 20**.

## **EMT**

1. O<sub>2</sub> as appropriate. Assist ventilations (PPV) if needed
2. Assess for shock
3. If BP greater than 100 mmHg, place in sitting position
4. Request ALS

## **ADVANCED EMT**

5. Cardiac monitor and 12-lead ECG
6. IV en route
7. Manage airway as needed, refer to **Blue 3**

**A**

8. Contact OLMC for administration of nitroglycerin 0.4 mg tab or 1 spray **SL**. Repeat nitroglycerin at 2-minute intervals if systolic BP greater than 100 mmHg. After initiation of SL nitroglycerin, may place 1 inch of nitroglycerin ointment 2% to the chest wall if BP greater than 100 mmHg and remove nitroglycerin ointment 2% if BP less than 100 mmHg. If the patient has had nitroglycerin before and no IV is established, and systolic BP is greater than 100 mmHg, then it is OK to give nitroglycerin.

9. Consider use of CPAP

## **PARAMEDIC**

10. Paramedic may perform all treatments above without medical control

11. Contact OLMC if above measures are not working

**P**



# Pulmonary Hypertension Complications

E

There are increasing numbers of patients being treated for pulmonary hypertension throughout the state of Maine. Pulmonary hypertension is a disease in which a patient's pulmonary arterial pressures are elevated and can be due to multiple factors, including heart disease, chronic lung disease, or thromboembolic disease. Additionally, in some cases of pulmonary hypertension, the etiology is uncertain. Patients manifest with multiple clinical symptoms, including dyspnea, chest pain and syncope. Pulmonary hypertension is NOT a disease that will be diagnosed in the prehospital setting. Increasingly, patients are being treated for the disease with medications that cause pulmonary vascular vasodilation, such as treprostinil (Remodulin).

## EMT

### Transport Destination

Preferably, patients suffering from pulmonary hypertension who are treated by a specialist should be transported to the hospital managing their disease for ALL emergencies whenever feasible or operationally reasonable. If operational circumstances or the patient's needs dictate otherwise, please transport to the closest reasonable facility. Please consult OLMC for any questions.

## ADVANCED EMT

### Medication Interruption

Treprostinil (Remodulin) and other medications used to treat pulmonary hypertension are provided by central access, typically through a pump. Patients are often treated with both IV and oral medications. Disruptions of the patient's IV medications can lead to increased symptoms. Most medication interruptions are NOT related to the pump, but rather the patient's central line and loss of access. In the case of interruptions of IV medication due to loss of central access:

1. Establish peripheral access

## PARAMEDIC

2. Verify the patient's medication and dose
3. Re-initiate the patient's medication through the newly-established peripheral access
4. Consider the transport destination suggestions as listed above.

P

## PEARLS FOR PULMONARY HYPERTENSION COMPLICATIONS

Most medications used to treat pulmonary hypertension have a high pH and if left running through a peripheral line too long (greater than 4 hours) may cause peripheral vein phlebitis and sclerosis. Please document the time the medication was initiated through the peripheral line and alert treating Emergency staff.

For any questions, please contact On-Line Medical Control.

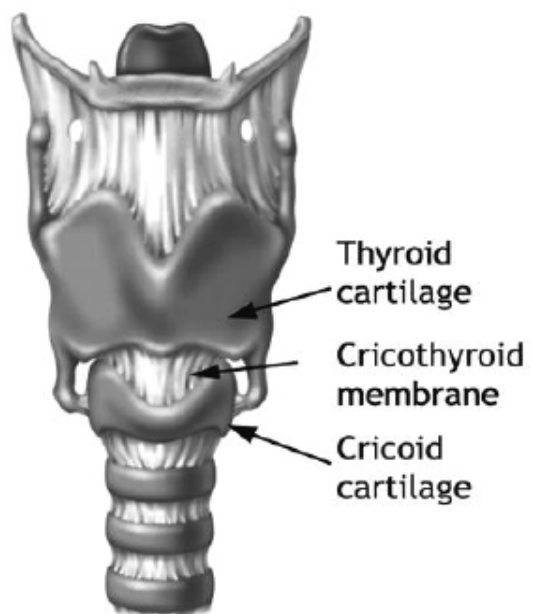
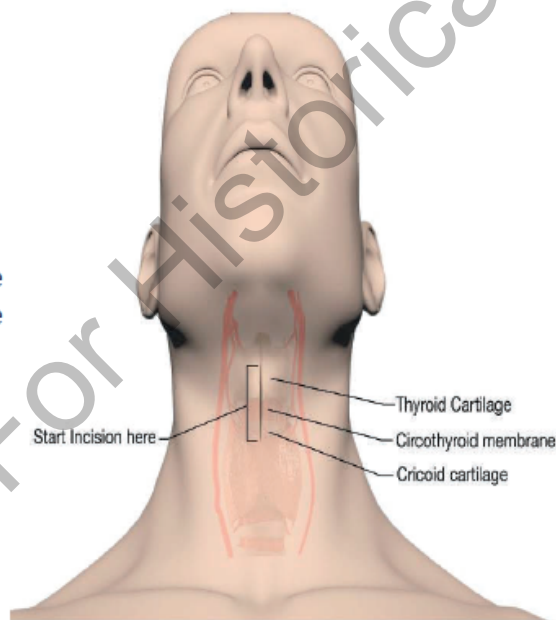
# Surgical Cricothyrotomy #1

The following protocol is an effort to maintain awareness of a procedure that occurs rarely in the Maine EMS system. Ultimately, this procedure should be practiced on a regular basis to maintain proficiency. PLEASE NOTE, this protocol describes a generally acceptable open cricothyrotomy and will differ from services that employ percutaneous kits. The inclusion of this protocol DOES NOT mandate that all providers use this exact procedural description. Providers should employ the procedure they are trained, practiced and most comfortable with. This protocol is one of multiple acceptable means to perform this procedure. Regardless of the procedure type, it is essential that Maine EMS paramedics are familiar with the available supplies and materials.

The primary indication for surgical cricothyrotomy is failure to maintain the airway (including oxygenation, ventilation, and protection) through other, less invasive means in a patient 8 years or older with palpable landmarks. In the Maine EMS experience, this has occurred predominantly in trauma cases with disruption of the face and normal airway anatomy and in choking patients. Even in some dramatic facial injuries, the airway may be adequately managed by sitting the patient up and leaning forward, as long as the other injury patterns allow.

## Materials/Equipment for Surgical Cricothyrotomy

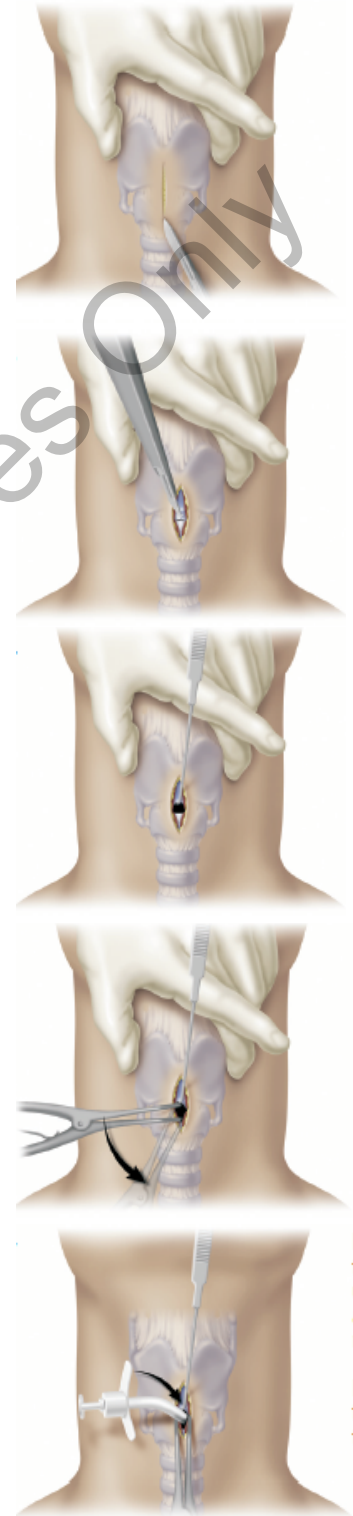
1. Cuffed tracheostomy tube or 6.0 - 7.0 ETT
2. Tracheal hook or bougie
3. Trousseau dilator (if available)
4. Syringe to inflate cuff



# Surgical Cricothyrotomy #2

## Procedure:

1. Extend the neck when possible to ensure best access to the trachea. Swab/cleanse the area.
2. Immobilize the trachea with your non-dominant thumb and middle finger while palpating the cricothyroid membrane with your non-dominant index finger. NOTE: The cricothyroid membrane is immediately **BELOW** the thyroid cartilage.
3. Make a 3 - 5 cm **vertical** incision over the cricothyroid membrane through the skin and subcutaneous tissues. NOTE: Severe bleeding is possible with this procedure and may occur at this or the following steps. Be prepared to suction and provide direct pressure to control bleeding
4. Palpate the membrane through the incision to confirm anatomy.
5. Make a small (1 cm or less) incision **horizontally** through the cricothyroid membrane.
6. Insert the tracheal hook or bougie in the opening of the membrane and rotate toward the head while maintaining hold of the thyroid cartilage with your non-dominant hand.
7. If Trousseau dilator available, insert into the incision site and spread vertical then rotate 90 degrees until the dilator is parallel with the neck.
8. Insert the cuffed tracheostomy tube or ETT tube into the incision site. Advance until the flanges rest on the skin of the neck (when using tracheostomy tube).
9. Carefully remove the dilator (if used), tracheal hook and obturator of the tracheostomy tube.
10. Inflate the balloon of the tracheostomy tube/ETT.
11. Ventilate and confirm position by physical exam and ETCO<sub>2</sub>.
12. Secure the tube in place.
13. Dress incision site.



# Tracheostomy Care #1

## Indication:

An adult or pediatric patient with an established tracheostomy with signs of respiratory distress or failure.



## Procedure:

1. Consult the patient's caregiver for assistance.
2. Assess the tracheostomy tube looking for easily reversible causes of distress, including detached oxygen source, plugging, etc.
3. Administer high-flow O<sub>2</sub> over the tracheostomy via non-rebreather mask or blow by.
4. If patient's respiratory distress continues, assist ventilation using a bag-valve-mask to the tracheostomy tube.
5. Suction the tracheostomy tube if unable to ventilate with BVM, coarse upper airway sounds or if respiratory distress continues despite BVM ventilation
  - a. Use the patient's suctioning supplies or a tube that is no more than 1/2 the diameter of the tracheostomy tube.
  - b. Use no more than 80 mmHg suction pressure in **pediatric** patients and 150 mmHg in **adults**
  - c. If tracheostomy tube has a cannula, remove it prior to suctioning
  - d. Determine the proper suction catheter depth by measuring the obturator. If no obturator is available, insert the suction catheter 2-3 inches into the tracheostomy tube. DO NOT force the suction catheter into the tracheostomy tube.
  - e. Preoxygenate when possible for 30-60 seconds then insert the suction catheter to the desired depth. Apply suctioning while removing the catheter. Gently rotate the catheter while withdrawing. This should take 10 - 15 seconds.
6. Consider using 2 - 3 mL of saline or nebulized saline to help loosen thick secretions
7. If respiratory distress continues, consider likely cause and reference appropriate protocol

In the case of an adult or pediatric patient with established tracheostomy tube (greater than 2 weeks old), in respiratory distress or failure in which the above measures have not succeeded in improving respiratory status, consider replacing the tracheostomy tube. This protocol may also be appropriate for patients with dislodged tracheostomy tubes.

## PEARLS FOR TRACHEOSTOMY CARE

There are many types of tracheostomy tubes on the market. One of the most common types is the Shiley. These tracheostomy tubes have an inner and outer cannula. **PLEASE NOTE:** only the inner cannula has a 15 mm adapter that will fit a BVM, the outer cannula will not. The inner cannula **MUST** be in place to ventilate the patient

**ANY** bleeding from the tracheostomy site should be evaluated emergently. Follow the Hemorrhage/Hemorrhagic Shock protocols, **Green 12 & 13**, AND, in the case of severe hemorrhage from the tracheostomy site, hyperinflate the tracheostomy cuff with 50 mLs, in an effort to tamponade the bleeding vessel. Inflate slowly, to prevent cuff rupture. Depending on the make and model of the tube, inflating the entire 50 mL may not be possible.

# Tracheostomy Care #2

## Indication for Tracheostomy Replacement:

An **adult** or **pediatric** patient with an established tracheostomy (greater than 2 weeks old) with signs of respiratory distress or failure that have not improved with measures listed on the previous page. Also, for patients dislodged tracheostomy. If tracheostomy tube is less than 2 weeks old, refer to **Blue 3** and attempt to secure airway from above.

## Necessary Equipment:

- Replacement tracheostomy tube, if available (from the patient or care giver)
- If no replacement tracheostomy tube is available, an ETT of similar internal diameter (see below)
- If possible, water-based lubricant jelly

## Procedure:

1. Place the patient on high-flow O2 and monitor
2. Place patient in a semi-recumbent position with the neck slightly extended
3. Remove old stoma dressing and clean the site
4. Lubricate the new tracheostomy tube or replacement ETT
5. Deflate the old tracheostomy tube's balloon and remove during exhalation
6. Using the replacement tracheostomy tube's obturator, insert the replacement tube at a 90 degree angle to the cervical axis.
7. Next, gently advance the replacement tracheostomy tube in a fluid fashion, using the natural curvature of the tube until the flange is flush against the neck.
8. Remove the obturator if using a replacement tracheostomy tube and insert the hollow internal cannula.
9. If using an ETT as replacement, remove the old tracheostomy tube as described above, insert a bougie into the stoma directed downward. Slowly advance the lubricated ETT into the stoma. **RECALL**, when using an ETT as replacement, it need only be advanced a few centimeters into the stoma. Consider shortening the ETT by cutting the tube **AFTER** the takeoff for the balloon inflation.
10. Inflate the cuff of the replacement tracheostomy tube or ETT
11. Secure the device to the patient's neck.

Portex Cuffed D.I.C. Tracheostomy Tubes		Shiley Tracheostomy Tubes	
Portex Tube Size (mm) and Color	Internal Diameter (mm)/ETT Equivalent	Shiley Tube Size	Internal Diameter (mm)/ ETT Equivalent
3.0	3.0/3.0-3.5	3.0 (NEO or PED)	3.0/3.0-3.5
3.5	3.5/3.5-4.0	3.5 (NEO or PED)	3.5/3.5-4.0
4.0	4.0/4.0-4.5	4.0 (NEO or PED)	4.0/4.0-4.5
5.0	5.0/5.0	4.5 (NEO or PED)	4.5/4.5-5.0
6.0 (orange)	6.0/6.0	5.0 (NEO or PED)	5.0/5.0
7.0 (green)	7.0/7.0	6	6.4/6.0-7.0
8.0 (white)	8.0/8.0	8	7.6/7.0-8.0
9.0 (blue)	9.0/9.0	10	8.9/9.0
10.0 (yellow)	10.0/10.0		

## PEARLS FOR TRACHEOSTOMY CARE

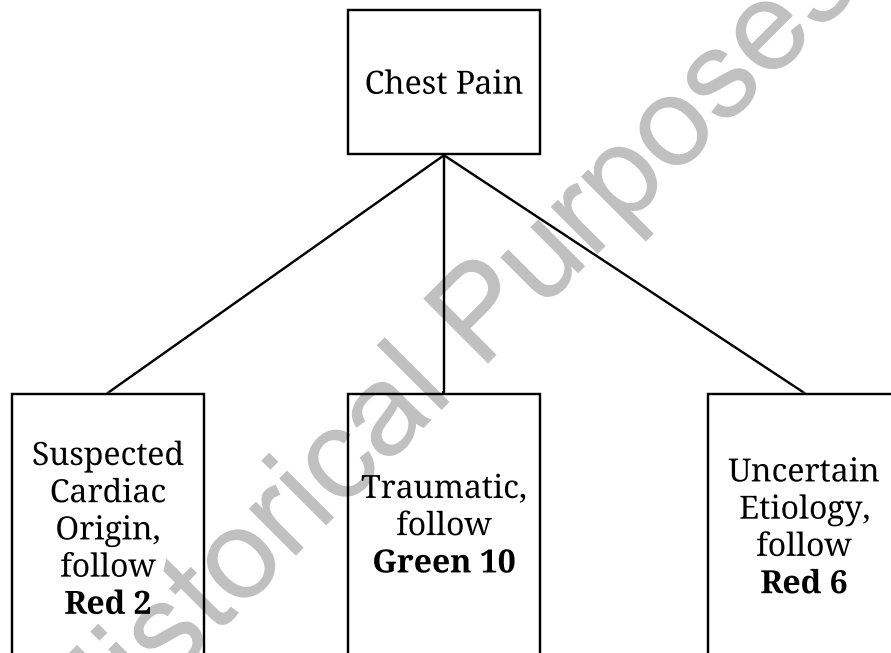
Please Note - the internal diameter of an ETT is designated by the tube name - i.e. 6.0 tube has a 6.0 mm internal diameter. If the tracheostomy is less than 2 weeks old, the track is immature and there is risk of creating a false lumen if attempts to replace or change the tracheostomy are made.



# Chest Pain - General

For all patients with chest pain, evaluation for acute coronary syndrome should occur. Commonly, it is difficult with the tools available to EMS providers to completely rule out a cardiac cause of chest pain. Therefore, all patients should be transported for emergency medical evaluation. Cardiac disease is but one of the many causes of chest pain and the EMS provider should consider various causes such as esophageal, chest wall, pulmonary embolism, aortic dissection, spontaneous pneumothorax, etc. Patients commonly fall into one of three categories: suspected cardiac, traumatic, or uncertain cause of chest pain.

**\*\*\*The cardiac monitor/defibrillator should be brought to the patient's side during the initial assessment. \*\*\***



Consider cardiac origin chest pain in the following:

- Chest pain or discomfort in other areas of the body (i.e. arm, jaw, epigastrium), shortness of breath, sweating, nausea, vomiting and dizziness.
- Atypical or unusual symptoms are more common in women, the elderly and diabetic patients. May also present with CHF, syncope and/or shock.

# Chest Pain - Suspected Cardiac Origin #1

- Avoid nitroglycerin in any patient who has used a phosphodiesterase inhibitor within the past 48 hours. Examples are:
  - sildenafil (Viagra, Revatio), vardenafil (Levitra, Staxyn), tadalafil (Cialis, Adcirca) which are used for erectile dysfunction and pulmonary hypertension.
  - epoprostenol (Flolan) or treprostinil (Remodulin) which are used for pulmonary hypertension.
- Administer nitrates with caution as hypotension can occur in *any* patient having an MI.

## E EMT

1. Administer O<sub>2</sub> to keep O<sub>2</sub> sats greater than or equal to 94% and less than 99% (avoid hypo/hyperoxia)
  2. Treat for shock if indicated
  3. Request ALS
  4. If patient has not taken an aspirin, administer chewable aspirin 324 mg **PO**, if not contraindicated by allergy
- 
5. Contact OLMC for the **OPTION** of assisting with the administration of patient's own nitroglycerin

## ADVANCED EMT

6. IV en route
  7. Cardiac monitor and 12-lead ECG within the first 10 minutes of patient contact, if so trained (AEMTs are not certified to interpret the 12-lead ECG or change the ALS response based on obtaining a 12-lead ECG. The purpose of the AEMT in obtaining the ECG is to present it to the Paramedic and/or receiving facility)
- 
8. Contact OLMC for administration of nitroglycerin 0.4 mg tab **SL** or 1 **SL** spray. May repeat two times at 5 minute intervals if BP is greater than 100 mmHg. If the patient has had nitroglycerin before and no IV is established, and systolic BP is greater than 100 mmHg, then it is OK to give nitroglycerin

## PARAMEDIC

9. Paramedic may perform all treatments above without medical control
10. Obtain 12-lead ECG within first 10 minutes of patient contact

If patient meets **STEMI** criteria, refer to local or regional cardiac systems of care for destination decision support and contact OLMC at receiving hospital to alert of impending arrival (local hospital notification) and go to **Red 3**.

**\*\*\*Have defib pads ready as these patients are high risk for VF/VT\*\*\***

11. Patients who present with inferior MI, clear lung sounds, and BP less than 90 mmHg, give fluid bolus.

(Continued)

# Chest Pain - Suspected Cardiac Origin #2 & STEMI Criteria

## PARAMEDIC (cont)

11. Consider
  - a. Additional nitroglycerin
  - b. Fentanyl 1 mcg/kg **IV/IM**, or **IN** to a MAX dose of 100 mcgs
  - c. Additional fluid bolus in patients with inferior MI
12. If patient develops a dysrhythmia, refer to appropriate protocol

Inferior MIs and right-sided MIs are commonly associated with bradycardia and blocks.

Hypotension may occur in any MI, not just inferior MIs with right ventricular involvement.

## STEMI Criteria

1. Septal (V1, V2), Anterior (V3, V4), Inferior (II, III, aVF) or Lateral MI (I, aVL, V5, V6): ST elevation greater than 1 mm in two or more anatomically contiguous leads with reciprocal changes.
2. For leads V2-V3, the criteria for STEMI are:
  - 2 mm - Males 40 yo and older
  - 2.5 mm - Males younger than 40 yo
  - 1.5 mm for Women independent of age
3. Posterior MI: ST depression greater than 1 mm in V1, V2 (and possibly V3) with an R/S ratio of greater than or equal to 1, place posterior leads to evaluate for ST segment elevation in leads V7/V8/V9

\*\*\*New LBBB is no longer a criteria for STEMI\*\*\*  
(Presence of any LBBB makes the diagnosis of STEMI difficult)

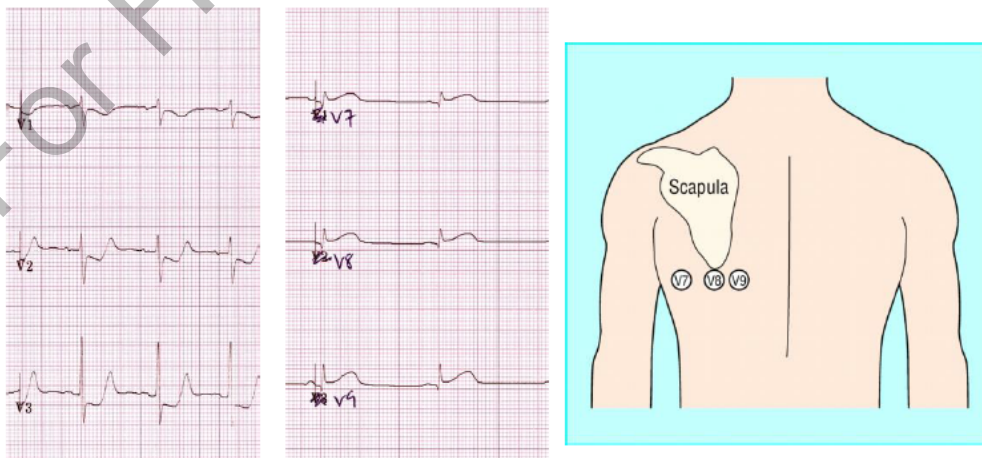
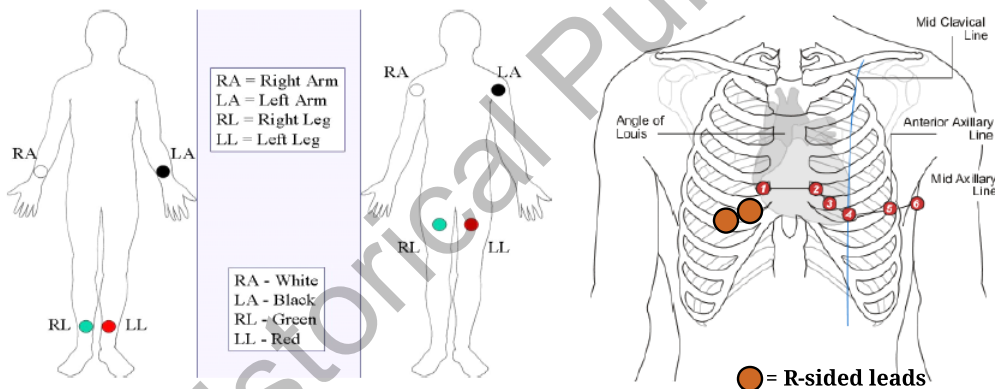


# Guidelines to the Prehospital Use of 12-Lead ECG by the ALS Provider

1. Prehospital 12-lead ECG is now a standard of care for increasing diagnostic information regarding the chest pain/cardiac arrest patient
2. Acquisition of a 12-lead ECG should be done in all patients with chest pain or a potential cardiac complaint/diagnosis such as syncope or shortness of breath. Given the frequency of atypical presentation in the elderly, responders must have a high index of suspicion in the elderly patient
3. Transmission of 12-lead ECG or presentation of prehospital 12-lead ECG to treating providers at the receiving ED is intended to augment patient triage and facilitate rapid identification of a potential thrombolytic or emergent catheterization candidate
4. In the case of STEMI, notify the receiving ED immediately

## \*\*\*Advanced EMT and the Use of 12-lead ECGs\*\*\*

AEMTs are not certified to interpret the 12-lead ECG or change the ALS response based on obtaining the 12-lead ECG. The purpose of the AEMT in obtaining the 12-lead ECG is to present it to the Paramedic and/or receiving facility.



**Consider Posterior Leads for suspected posterior MI**

# Chest Pain Fibrinolytic Checklist

For chest pain of suspected cardiac origin, initiate therapy per protocol, including the early use of aspirin and nitroglycerin, if not contraindicated.

Use this checklist, or local equivalent, if available.

Report the information as soon as practical to the receiving ED.

You may copy and use this page as your checklist, or you may use a checklist recommended by your usual receiving hospital which contains at least these questions.

**\*\*\*Please follow your destination institution's STEMI Checklist\*\*\***

Has pain persisted for greater than 15 min and less than 12 hours?	YES	NO
Is systolic BP less than 180 mmHg?	YES	NO
Is diastolic BP less than 100 mmHg?	YES	NO
History of structural CNS disease (i.e. AV malformation)	YES	NO
Significant closed head/facial trauma within previous 3 months?	YES	NO
Surgery or major trauma, GI/GU bleed in previous 2 weeks?	YES	NO
Any history of intracranial hemorrhage?	YES	NO
Any bleeding, clotting problem, or blood thinners?	YES	NO
Pregnant?	YES	NO
Serious systemic disease (i.e. advanced cancer, severe liver or kidney disease?)	YES	NO

# Chest Pain - Uncertain Etiology

For ALL patients with chest pain, consider the possibility of cardiac disease no matter what the history and physical suggest. However, there are other sources of non-cardiac chest pain to consider such as pulmonary embolism, spontaneous pneumothorax, aortic dissection/aneurysm, esophageal, chest wall, etc.

If trauma suspected, refer to the Chest Trauma protocol, **Green 10**.

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## EMT:

1. Administer O<sub>2</sub> only to patients with dyspnea, hypoxia (SpO<sub>2</sub> less than 94%) or signs of heart failure at a rate to keep O<sub>2</sub> sats greater than or equal to 94% and less than 99% (avoid hyperoxia)
2. Transport in position of comfort
3. Request ALS

## ADVANCED EMT

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4. Establish IV at TKO
5. Request Paramedic
6. Cardiac monitor and 12-lead ECG if so trained (AEMTs are not certified to interpret the 12-lead ECG or change the ALS response based on obtaining an 12-lead ECG. The purpose of the AEMT in obtaining the 12-lead ECG is to present it to the Paramedic and/or receiving facility)

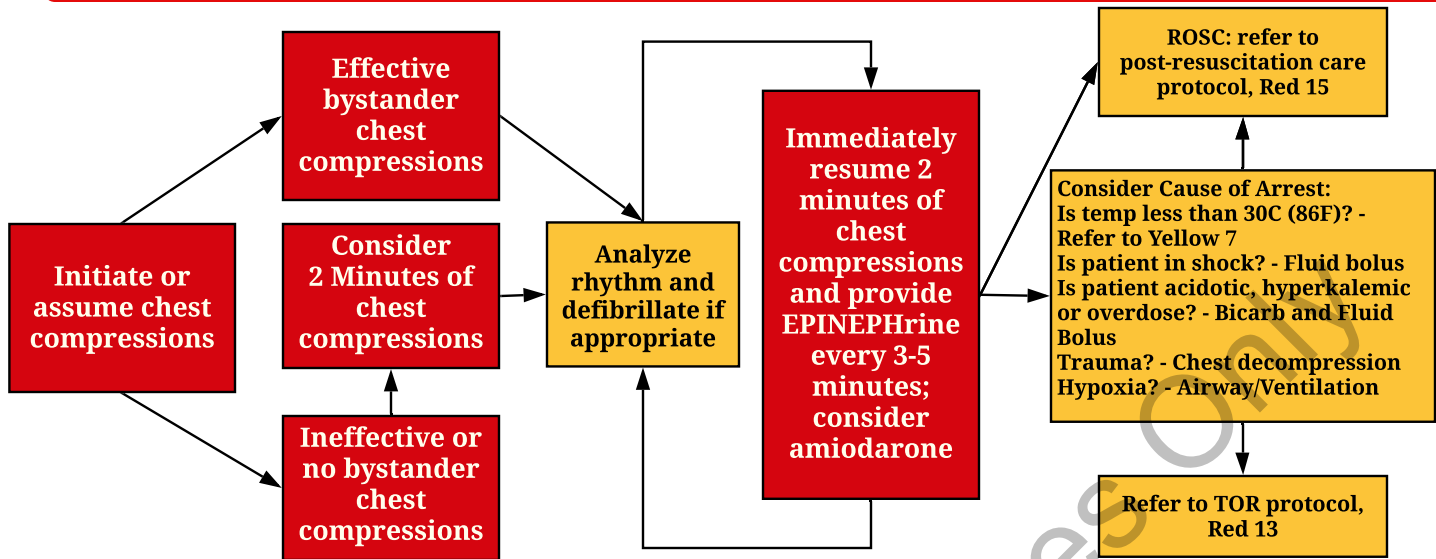
## PARAMEDIC

7. If 12-lead ECG indicates STEMI, refer to **Red 2 & 3**
8. For chest pain in a stable patient with normal level of consciousness, refer to the Universal Pain Management protocol, **Green 17** for analgesia options
9. For nausea and vomiting, refer to the Nausea and Vomiting protocol, **Gold 19**

P

# Cardiac Arrest Overview

START



Manage airway as appropriate. Consider basic measures first OR advanced airway without interruption of chest compressions.

## CARDIAC ARREST CHECKLIST

	Code leader and roles identified (pre-arrival)
	Continuous chest compressions with minimal interruption (compress while defib charging) and full recoil
	Turn on CPR feedback device/metronome with goal of 100-120 compressions/minute
	Rotate compressors at least every 2 minutes
	AED/Defib applied and monitored
	O <sub>2</sub> flowing and attached to NR/BVM
	ETCO <sub>2</sub> waveform present & monitored
	IV/IO established
	Possible causes considered
	Consult OLMC <b>early</b> to discuss complex cases
	Gastric insufflation limited and gastric decompression considered
	Family present and ongoing communication/support provided



Evaluate for all potential causes of cardiac arrest, including the 5 **H's** (Hypothermia, Hypovolemia, Hypoxia, Hypo/Hyperkalemia, H<sup>+</sup> ion or acidosis) and the 5 **T's** (Cardiac Tamponade, Tension Pneumothorax, Thromboembolic disease x 2 (i.e. pulmonary embolism/MI) and Toxins). Prior to termination of cardiac arrest, address potential causes of arrest, including effective management of patient airway, provision of fluid bolus, and consideration of bicarb in possible toxic, acidotic, or hyperkalemic patients. Please note, patients on dialysis are at risk for electrolyte abnormalities. Finally, consider needle decompression for tension pneumothorax if appropriate.

# Cardiac Arrest #1

## EMT

1. Initiate CPR until AED arrives unless valid DNR or signs incompatible with life are present; refer to Termination of Resuscitation protocol, **Red 13**
2. Attach AED as soon as available with minimal interruptions in chest compressions and follow AED prompts
3. Place oral and/or nasal airway(s)
4. High-flow O<sub>2</sub> with BVM ventilation 1 breath every 10 chest compressions during recoil and without interrupting compressions or at a ratio of 30:2
5. Request ALS
6. Continue 2-minute cycles of chest compressions and AED checks
7. If ROSC occurs, refer to Adult Post-Resuscitation Care protocol, **Red 15**
8. Consider termination of resuscitation; refer to **Red 13**

## ADVANCED EMT

9. Establish **IV/IO** without interrupting chest compressions
10. Manage the airway per **Blue 3**. Avoid respiratory rate greater than 10/minute in cardiac arrest
11. Defibrillate as indicated

## PARAMEDIC

12. One medication intervention at each 2-minute reassessment per ACLS protocol
13. EPINEPHrine 1 mg of 1 mg/10 mL **IV/IO** push every 3-5 minutes
  - a. VF/VT: amiodarone 300 mg **IV/IO** push; may consider additional 150 mg **IV/IO** one time
  - b. Torsades: 2 grams of magnesium sulfate **IV/IO**
  - c. For refractory VF/VT (total of 5 shocks, dose of EPINEPHrine and amiodarone), refer to Refractory VF/VT protocol, **Red 12**
14. Consider causes of OHCA:
  - a. Is patient on dialysis, have known renal disease or suspicion for hyperkalemia?
  - b. Is patient suspected TCA overdose?
  - c. Is there a suspected pre-existing metabolic acidosis?  
\*\*\*if yes to any of the above, then: \*\*\*
    - i. Sodium bicarbonate 50 mEq bolus **IV/IO**; may repeat x 2
    - ii. IV fluid bolus
  - d. Is hypovolemia suspected? If yes, give fluid bolus
  - e. Is hypoxia suspected? If yes, administer high-flow oxygen and manage airway per **Blue 3**
  - f. Do you suspect a pneumothorax? If yes, perform needle decompression
  - g. Is patient's core temperature less than 30°C (86°F) and circumstances consistent with hypothermia? If yes, see Hypothermia #2 protocol, **Yellow 8**
15. Upon ROSC:
  - a. Refer to Adult Post-Resuscitation Care protocol, **Red 15**
  - b. Contact OLMC for options of:
    - i. Post-resuscitation amiodarone bolus
    - ii. Post-resuscitation amiodarone drip





## Cardiac Arrest #2

Effective chest compressions and defibrillation are the most important therapies for the patient in cardiac arrest. Effective chest compressions are defined as:

- a. A rate of 100 - 120 compressions/minute
- b. Depth of between 2 - 2.5 inches
- c. Allow for complete chest recoil
- d. Minimize interruptions in compressions
- e. Rotate rescuers every 2 minutes
- f. Avoid respiratory rate greater than 10/min
- g. Quantitative end-tidal CO<sub>2</sub> should be used to monitor effectiveness of chest compressions. If ET CO<sub>2</sub> is < 10 mmHg, attempt to improve chest compression quality
- h. Consider additional monitoring with biometric feedback

Resuscitate on scene as the effectiveness of chest compressions decreases during any patient movement. Resuscitation on scene should be the goal, with the only exceptions being safety concerns for the responding crew OR inability to effectively resuscitate in the patient's current location.

All services MUST have an organized and structured response to the care of patients in cardiac arrest. This approach must be pre-arranged and may be modeled on the Maine EMS ICS for OHCA Program or other well-accepted structured approach to patient care. Also, EMS services are encouraged to train providers to these systems of care and to regularly train providers in high-performance CPR.

Use capnography during resuscitation for confirmation and monitoring of advanced airways and for prolonged use of BVM as well as monitoring effectiveness of chest compression and return or loss of spontaneous circulation.

Note: The algorithms for cardiac arrest or arrhythmias reflect the MEMS Medical Direction and Practices Board's interpretation of ACLS guidelines, as they should be used in the prehospital setting.

In the case of peripartum cardiac arrest, provision of high-quality CPR remains a priority. If a patient's fundus height is at or above the level of the umbilicus, manual left uterine displacement is the preferred method of relieving aortocaval compression during chest compressions. Additionally, local hospital resources for advanced care should be activated immediately upon recognition of peripartum cardiac arrest. Contact OLMC to discuss the potential of additional therapies.

Pediatric cardiac dysfunction is usually due to a respiratory cause and is thus more likely to initially respond to effective oxygenation and ventilation followed by fluid administration and then medications. Defibrillation alone is rarely successful.



It is also prudent to consider foreign body airway obstructions given the age of the patient.

## Cardiac Arrest #3 (Mechanical CPR Devices)

- 1) Mechanical CPR (mCPR) devices are not mandatory devices, but may play a role in three prehospital cardiac arrest settings, including:
  - a) Resuscitation events with few numbers of rescuers,
  - b) Resuscitation events that are prolonged,
  - c) Resuscitation events occurring during transport.
- 2) Manual CPR **MUST** remain the FIRST strategy for chest compressions as manual CPR is the most readily available and effective compression strategy in the vast majority of cases.
- 3) If applied, a mCPR device should be placed in a manner which minimizes interruptions, keeping all breaks in CPR to less than 10 seconds.
- 4) Application Process -- Upon encountering a patient in cardiac arrest:
  - a. Initiate manual CPR
  - b. Continue manual CPR for a minimum of 2 two-minute cycles. Placement or implementation of mechanical CPR may not begin until AFTER the 2nd cycle of CPR.
  - c. If the responding EMS service chooses to implement mechanical CPR, placement may begin AFTER the second cycle of CPR and must be applied in a manner that coordinates with pulse/rhythm checks AND keeps all breaks in CPR to less than 10 seconds.
  - d. Apply the device in accordance to manufacturer's instructions.
  - e. It is possible that application of the device, in a manner that is coordinated with pulse/rhythm checks and maintains interruptions in CPR less than 10 seconds, may take an additional 2 or more cycles of CPR, leading to initiation of mechanical CPR after the 4th round of manual CPR.
- 5) Contraindications to Mechanical CPR
  - a. Age less than 18.
  - b. Patients who are unable to fit into the device due to body habitus.
- 6) In addition to the above, mechanical CPR devices may be placed prior to transport in patients that have recently achieved ROSC in the event of rearrest. The device should be in "stand-by" mode and activated if patient re-arrests en route to the hospital.
- 7) All Maine EMS Providers should be trained in High Performance CPR and Incident Command for Cardiac Arrest.
- 8) Mechanical CPR devices should ONLY be used by providers who have been trained to use the devices and can apply the devices while maintaining all breaks in CPR to 10 seconds or less.
- 9) Additionally, Maine EMS Providers should routinely practice High Performance CPR, Incident Command for Cardiac Arrest and, if the service chooses, placement and use of mechanical CPR devices. The frequency of such training is difficult for the MDPB to determine for each individual service. Ultimately, this number will be determined by multiple factors, including the size of the service and the service's annual number of resuscitation attempts. As a guide, some of the EMS services with the highest survival from witnessed VF arrest perform resuscitation training (including high performance CPR and ICS for cardiac arrest) 2-4 times a year. Please consult with your service medical director and QI program to assist in determining the proper frequency of trainings for your service.

E A P



# Pediatric Cardiac Medications & Dosages

Prehospital providers should consider patient age, diagnosis, transport time, provider experience, and effectiveness of ongoing bag-valve-mask ventilation in considering whether to continue with bag-valve-mask ventilation versus proceeding to endotracheal intubation. Bag-valve-mask ventilation has been shown to be equivalent to endotracheal ventilation in pediatric patients in most situations with short transport times.



Atropine 0.02 mg/kg (Indication: Bradycardia)	<b>IV/IO:</b> Minimum dose: 0.1 mg MAX single dose: 0.5 mg (child), may repeat once
EPINEPHrine: 1 mg/10 mL (Indication: Bradycardia)	<b>IV/IO:</b> 0.01 mg/kg (0.1 mL/kg) to a MAX single dose of 1 mg
EPINEPHrine: 1 mg/10 mL (Indication: Asystole/Pulseless Arrest)	<b>IV/IO:</b> 0.01 mg/kg (0.1 mL/kg) to a MAX single dose of 1 mg  Repeat every 3-5 minutes
Amiodarone (Indication: VF/VT)	5 mg/kg <b>IV/IO</b> Bolus: can repeat up to total dose of 15 mg/kg. MAX single dose: 300 mg
Sodium Bicarbonate (Indications: wide complex PEA suggesting hyperkalemia or sodium channel blocker overdose)  Common sodium channel blockers include: tegretol, carbamazepine, TCA's, propranolol, and flecanide	<b>IV/IO:</b> 1 to 2 mEq/kg bolus MAX single dose: 50 mEq, repeat every 5 minutes until QRS duration less than 120 msec
Magnesium (Indication: Torsades de Pointes, moderate/severe asthma)	<b>IV/IO:</b> 25-50 mg/kg MAX single dose: 2 g

Synchronized Cardioversion: 0.5 - 1.0 J/kg (initial); 2 J/kg (subsequent)

Defibrillation: 2 J/kg (initial); 4 J/kg ; 6 J/kg; 10 J/kg (maximum)

# Refractory VF/VT

Prior to attempting double-sequential defibrillation (DSD), at least one shock should be given at maximal energy using a different vector. i.e. apply a new set of pads in the anterior-apex position if anterior-posterior has failed. Do not allow the pads to touch one another (see diagram below).

## DOUBLE-SEQUENTIAL DEFIBRILLATION:

This can only be performed with MANUAL defibrillators.

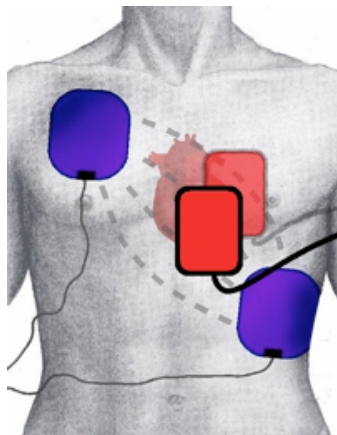
\*\*\*\*Check with the manufacturers of your manual defibrillators re: the warranty if used in double-sequential defibrillation\*\*\*\*

**INDICATION:** refractory VF/VT after 5 unsuccessful shocks (with vector change), administration of EPINEPHrine and amiodarone.

- **Recurrent VF/VT** is defined as SUCCESSFULLY CONVERTED by standard defibrillation techniques but subsequently returns. It should NOT be treated by DSD. It is managed by treatment of correctable causes and use of anti-arrhythmic medications in addition to standard defibrillation.
- **Refractory VF/VT** is defined as NOT CONVERTED by standard defibrillation. It is initially managed by treating correctable causes with anti-arrhythmic medications. If these methods fail to produce a response, DSD may be beneficial.

## PROCEDURE:

1. Assure that controls for the second manual defibrillator are accessible to the team leader
2. Verify that both cardiac manual defibrillators are attached to the patient, that all pads are well-adhered, and simultaneously charge both manual defibrillators
3. When both defibrillators are charged to maximum energy settings and all persons are clear, push both shock buttons as synchronously as possible
4. May repeat procedure every 2 minutes as indicated if refractory VF/VT persists



# Termination of Resuscitation #1

Resuscitation should be **withheld** under the following circumstances:

- When it is found that the patient has a DNR order or other actionable medical order (i.e. POLST/MOLST form, etc.)
- Scene Safety: the physical environment is not safe for the provider(s)
- When irreversible signs of death, such as rigor mortis, dependent lividity, decapitation, decomposition, incineration, other obvious lethal injuries are present.
- When down time has been unknown or greater than 20 minutes with no bystander CPR performed and the patient is cool to touch (not from exposure), no audible heart sounds, and fixed/dilated pupils.

Resuscitation may be **terminated**:

- When the patient regains pulse/respirations
- When the rescuers are physically exhausted or when equally or more highly trained health care personnel take over
- In the absence of ALS, when the same Maine EMS licensed crew member has determined the absence of vital signs for 20 minutes, in spite of BLS, except in the case of hypothermia, see Hypothermia protocol, **Yellow 7**
- When it is found that the patient has a DNR order or other actionable medical order (i.e. POLST/MOLST form, etc.)
- When the following time frames have been met for ALS providers alone:
  - Persistent asystole x 20 minutes
  - Slow and/or wide complex PEA x 20 minutes
  - Fast/narrow PEA x 45 minutes
  - VF/Pulseless VT x 60 minutes
- If ALS providers arrive on scene of a patient managed by BLS providers, consider TOR if:
  - After a total (BLS + ALS) resuscitation time of 20 minutes, the AED has **never** advised shock AND the first rhythm noted by ALS providers is asystole or slow/wide PEA
  - If patient is found in fast/narrow PEA does not achieve ROSC after 45 minutes of ALS + BLS care
  - If the patient is found in VF/Pulseless VT does not achieve ROSC after 60 minutes of ALS+BLS care
  - In the case of fast/narrow PEA and VF/Pulseless VT, the ALS provider must complete the ALS algorithm as dictated in these protocols prior to consideration of TOR, regardless of time frame

\*Survival and functional neurologic outcomes are unlikely if ROSC is not obtained by EMS. It is dangerous to the crew, pedestrians and other motorists to attempt to resuscitate a patient during ambulance transport. If circumstances do not allow TOR for safety or other reasons, notify OLMC.

**If Resuscitative Efforts are terminated:**

1. Focus attention on the family or bystanders. Explain the rationale for termination
2. Consider accessing support for family: other family, friends, or social support such as clergy
3. If termination of resuscitation occurs, one must consider management of the patient's remains. No one option is correct for all circumstances; factors on scene will likely dictate the best option. Refer to **Grey 4**. If questions remain regarding disposition of the patient's remains, contact OLMC

## Termination of Resuscitation #2

Termination of resuscitation is an important aspect of the medical care of the cardiac arrest patient. When resuscitative efforts have failed to be successful, compassionately transferring attention to the patient's surviving loved ones and ensuring proper final care of the deceased are essential. Please recall from the 2011 Maine EMS Protocol Update that those final steps in care for the deceased include the following:

- 1) Notification of the family – May have already occurred. However, if the patient passes away without family or friends present, contingencies for family notification must be made.
- 2) Disposition of Patient Remains – There are multiple options for disposition of patient remains which include local funeral homes, the local ED, the local hospital's morgue, the Medical Examiner's office, etc. It is essential that your service partners with local hospitals, local police, and local funeral homes to facilitate this process. Please refer to the Maine EMS 2011 EMS Protocol FAQ sheet.
- 3) Notification of the patient's PCP (if the patient has one) and the Medical Examiner
- 4) Signing the patient's death certificate – Only a physician with a relationship to the patient (PCP or treating physician – includes an emergency physician resuscitating the patient) or the Medical Examiner can sign the death certificate.
- 5) Notification the New England Donor Services at 1-800-446-6362 with the following information; patient's name, date of birth, location of arrest, your contact phone number, and time of death.



### ABSOLUTE RULE-OUTS

1. Obvious signs of decomposition
2. Last known alive  $\geq$  18 hours
3. Evidence of IV drug abuse
4. Known HIV or Hepatitis



### REFERRAL INFORMATION

- |  |   |
|--|---|
| 1. Name & DOB of Patient                             | 5. # of IVs Attempted, Established & Amount of Fluids Infused |
| 2. Date & Time Last Known Alive or Pronounced Dead   | 6. Which Police Dept. Involved & Phone Number?                |
| 3. Cause of Death/Evidence of Drug Use at Scene      | 7. MEO contacted? Accepted?                                   |
| 4. Any known Medical History/Regular Medications     | 8. Where is body going? (MEO/ Funeral Home)                   |
| 9. NOK contact info (name, relation, best # to call) |   |

# Adult Post-Resuscitation Care

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## EMT

1. Manage airway. Administer O<sub>2</sub> only to keep O<sub>2</sub> sats greater than or equal to 94% and less than 99% (avoid hypo/hyperoxia). Maintain ventilation rate between 10-12 breaths per minute
2. Request ALS

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## ADVANCED EMT

3. Provide advanced airway management if indicated and initiate capnography. Avoid excessive ventilation. Aim for ventilation rate between 10-12 breaths per minute
4. Obtain IV access and treat hypotension with fluid boluses. Goal systolic BP after ROSC is greater than or equal to 100 mmHg. For post-resuscitation hypotension, administer fluid boluses. Total volume should not exceed 2000 mL
5. Perform 12-lead ECG, if so trained

## PARAMEDIC

### Goal #1 - Identify STEMI

6. If evidence of STEMI on 12-lead ECG, refer to STEMI protocol, **Red 2** and follow local STEMI referral patterns

### Goal #2 - Aggressive management of hypotension

7. Goal systolic BP after ROSC is greater than or equal to 100 mmHg. For post-resuscitation hypotension, administer IV fluid boluses. Total volume should not exceed 2000 mL

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8. If hypotension persists, contact OLMC for the following OPTION:
  - a. NOREPInephrine **IV infusion**:
    - i. **Preparation** - mix NOREPInephrine 8 mg in 250 mL NS
    - ii. **Dosing** - starting dose of NOREPInephrine is 0.03 mcg/kg/min. Titrate by 0.03 mcg/kg/min every 3-5 minutes. Usual dose is 0.03 - 0.25 mcg/kg/min. Usual MAX dose is 0.6 mcg/kg/min. Absolute MAX dose is 3 mcg/kg/min
  - b. Titrate to maintain systolic BP greater than 100 mmHg
  - c. NOREPInephrine infusions in adults and pediatrics must be administered via a Maine EMS-approved medication pump



9. If seizure develops, refer to Seizure protocol, **Gold 8**
10. If patient suffers loss of spontaneous circulation and re-arrests, refer to appropriate guideline



# Tachycardia #1

**NOTE: For all cases, attempt to identify and treat the underlying cause of the patient's tachycardia which may include maximizing oxygenation or (for Advanced EMTs/Paramedics) maximizing hemodynamics. If uncertainty exists between sinus tachycardia and SVT, please contact OLMC.**

## EMT

1. Airway management per **Blue 3**
2. Request ALS

## ADVANCED EMT

3. Establish IV/IO
4. Cardiac monitor, perform 12-lead ECG, if so trained
5. Request Paramedic

## PARAMEDIC

**If hemodynamically UNSTABLE, as manifested by any of the following: hypotension, altered mental status, syncope/pre-syncope, chest pain, dyspnea, acute heart failure, signs of shock:**

6. Consider **synchronized** cardioversion
  - a. **ADULT Regular Narrow** complex (SVT): 50J or monophasic equivalent. With subsequent attempts: 100J, then 120-150J, then 200J, then max available dose
  - b. **ADULT Irregular Narrow** complex (a-fib): 120-200J or monophasic equivalent. Subsequent attempts progress to 200J, then max available dose
  - c. **ADULT Regular Wide** complex (VT): 100J or monophasic equivalent. Subsequent attempts progress to 150J, then 200J then max available dose.
  - d. Consider sedation with midazolam 3 mg **IV/IO/IN** or fentanyl 1 mcg/kg **IV/IO/IN** to MAX of 100 mcg for initial dose
  - e. If unable to synchronize, or in the case of patient instability or polymorphic VT, defibrillate x 1 at 200J or monophasic equivalent
7. Rate control for A-Fib/A-Flutter ONLY, contact OLMC for option of metoprolol 5 mg **IV** over 5 minutes. REMEMBER, *metoprolol must not be used in hypotension (SBP less than 100 mmHg). Discuss wheezing, if present, with OLMC before administration*
  - a. May repeat metoprolol 5 mg **IV** over 5 minutes after consultation with OLMC
8. Contact OLMC for further options, including amiodarone drip (for wide complex tachycardia)



# Tachycardia #2

## If hemodynamically STABLE

9. **Narrow complex** tachycardia (with a heart rate persistently greater than 150 bpm):
- a. Valsalva maneuver
  - b. Adenosine 6 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush
    - i. May repeat adenosine x 1 at 12 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush
10. **Wide complex** tachycardia
- \*\*\*Only for **REGULAR** rhythm with **MONOmorphic QRS** (see PEARL)\*\*\*
- a. Adenosine 6 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush
    - i. May repeat adenosine x 1 at 12 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush
  - b. Consider amiodarone 150 mg **IV/IO** over 10 minutes

## For POLYmorphic wide complex tachycardia (Torsades de Pointes)

- P 11. Magnesium sulfate 1-2 grams **IV** over 5 minutes

Treatment of pre-excitation rhythms (such as WPW) include blocking at the level of the AV node, using adenosine or beta-blockers. Patients with *pre-excitation AND A-fib* should **NOT** receive any agents that block the AV node, as this could cause VF. WPW with A-fib may be recognized by a very fast rhythm, a predominance of wide QRS complexes with occasional narrow complexes and an irregular rhythm. When WPW with A-fib is suspected, the patient should **NOT** receive any medications that block the AV node because this will force all impulses through the accessory pathway and can cause VF. *Instead, these patients should be cardioverted when they become unstable.*

Do **NOT** give adenosine to a patient with Polymorphic VT or Torsades.

Do **NOT** give amiodarone to a patient converted from Polymorphic VT unless QT interval is less than 0.500 sec.

If QT interval is greater than 0.500 sec, contact OLMC for options.



# Bradycardia #1

Heart rate less than 50 beats/min

**Concerning signs or symptoms:** hypotension, altered mental status, syncope/pre-syncope, chest pain, dyspnea, acute heart failure, signs of shock, or cyanosis/pallor:

***If NO concerning signs or symptoms, then all levels (EMT/Advanced EMT/Paramedic) may do the following:***

1. O<sub>2</sub> as appropriate
2. Advanced EMT/Paramedic ONLY – consider fluid bolus

***If ANY concerning signs or symptoms, then:***

## EMT

1. O<sub>2</sub> as appropriate
2. Request Paramedic

## ADVANCED EMT

3. IV en route and fluid bolus as required
4. Cardiac monitor, perform 12-lead ECG, if so trained
5. Request Paramedic

## PARAMEDIC

6. Atropine 0.5 mg **IV/IO\***; give in repeat doses every 3 - 5 minutes up to a maximum dose of 0.04 mg/kg (or up to a total of 3 mg in the adult patient)
7. Apply external pacer—Initiate transcutaneous pacing (TCP) for patients who do not respond to atropine; if serious signs or symptoms, do not delay TCP while awaiting IV/IO access or for atropine to take effect. Consider premedicating with midazolam 3 mg **IV/IN/IO** OR fentanyl 1 mcg/kg **IV/IN/IO** to a MAX first dose of 100 mcg. Notify **OLMC** as **soon as possible**
8. If continued signs or symptoms, consider:
  - a. Repeat atropine or
  - b. EPINEPHrine **IV infusion**, which may typically be dosed the following way:

**Preparation** - Add 1mL (1mg) of EPINEPHrine 1mg/mL to 250 mL bag NS. This results in a 1 mg/250 mL = 4 mcg/mL mix.

**Dose** - Start at 0.05 mcg/kg/min. Titrate by 0.05 mcg/kg/min every 5 min. Titrate to desired effect which may include resolution of bradycardia, SPB of > 90 mmHg and/or MAP > 65 mmHg.

**Usual dose** is 0.05-0.5 mcg/kg/min. Absolute maximum dose is 0.5 mcg/kg/min
  - c. EPINEPHrine infusions must be administered via a Maine EMS-approved medication pump



**\* Transplanted, denervated hearts will not respond to atropine. Proceed to pacing, vasopressor infusion, or both\***

## Bradycardia #2

Heart rate less than 50 beats/min

### PEARLS for Bradycardia:

#### Consider causes of bradycardia:

MI, hypoxia, pacemaker failure, hypothermia, sinus bradycardia, sick sinus syndrome, AV blocks, overdose (calcium channel blockers, beta-blockers, digoxin, organophosphates), hyperkalemia (in wide complex).

Application of **TCP** should be considered if deterioration is anticipated because of the following:

- a. Observed sinus pauses
- b. Episodes of 2<sup>nd</sup> degree Type II, or 3<sup>rd</sup> degree AV Block

**Pre-medication** for TCP is preferably via the IV route. If unable to obtain IV, may try IN route in the cooperative patient with goal of ultimately obtaining IV/IO access.

# Cardiogenic Shock

E

## EMT

1. O<sub>2</sub> as appropriate
2. Request ALS

## ADVANCED EMT

3. Cardiac monitor, obtain 12-lead ECG, if so trained
4. IV en route
5. Request Paramedic

A

6. Contact OLMC with following information:  
Vital signs, lung sounds, cardiac rhythm, pedal edema assessment for  
OPTION OF:
  - a. Fluid bolus



## PARAMEDIC

7. Contact OLMC for the following OPTION:
  - a. NOREPInephrine **IV infusion**:
    - i. Preparation – mix NOREPInephrine 8 mg in 250 mL NS.
    - ii. Dosing - Starting dose is NOREPInephrine 0.03 mcg/kg/min. Titrate by 0.03 mcg/kg/min every 3-5 minutes. Usual dose is 0.03-0.25 mcg/kg/min.  
Usual max dose is 0.6 mcg/kg/min. Absolute max dose is 3 mcg/kg/min
  - b. Titrate to maintain systolic BP greater than 100 mmHg
  - c. NOREPInephrine infusions in adults and pediatrics must be administered via a Maine EMS-approved medication pump



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## PEARLS for Cardiogenic Shock

- Pediatric patients suffering from suspected cardiogenic shock should receive fluid boluses of 10 mL/kg with frequent reassessment for tolerance and need for additional fluids.



# Syncope

## EMT

1. Obtain history (seizure, stroke, fluid loss, palpitations, chest pain, dizzy, trauma) and consider spinal immobilization if appropriate
2. O<sub>2</sub> as appropriate
3. Perform finger stick to measure blood glucose, if so trained. If blood glucose less than 60 mg/dL, refer to Diabetic/ Hypoglycemic Emergencies protocol, **Gold 6**
4. Treat for shock if appropriate. If the cause of the shock is:
  - a. Anaphylaxis, refer to Anaphylaxis protocol, **Gold 1**
  - b. Cardiogenic, refer to Cardiogenic Shock protocol, **Red 20**
  - c. Tension Pneumothorax, see Chest Trauma protocol, **Green 10**
  - d. Medical Shock, see Medical Shock protocol, **Gold 14**
5. Request ALS

## ADVANCED EMT/PARAMEDIC

6. Establish IV access
7. Cardiac monitor and 12-lead ECG, if so trained
8. Fluid bolus if appropriate
10. AEMT to request Paramedic

NOTE: At any time, if relevant signs/symptoms found, go to appropriate protocol

## PEARLS for Syncope

- \* Syncope is defined as loss of consciousness accompanied by loss of postural tone.
- \* All of these patients should be transported for emergency evaluation.
- \* More than 25% of geriatric syncope is cardiac dysrhythmia-based.
- \* 12-lead ECGs and cardiac monitoring are important for this patient population. The ECG should be evaluated for potential causes of syncope such as: ischemia, QT prolongation, Brugada Syndrome, pre-excitation, arrhythmia and hypertrophic cardiomyopathy.

## A NORMAL ECG DOES NOT RULE OUT CARDIAC CAUSE OF SYNCOPÉ

- \* Because of proximity to the event, EMS providers may be the only providers able to capture cardiac causes of syncope.
- \* Consider other causes including GI bleed, ectopic pregnancy, seizure, stroke, hypoglycemia, shock, toxicologic (i.e. alcohol), and medications.

# Ventricular Assist Devices #1

## Patient Care Goals

- Rapid identification of, and interventions for, cardiovascular compromise in patients with VADs
- Rapid identification of, and interventions for, VAD-related malfunctions or complications

## Inclusion Criteria

- Any patient with a Ventricular Assist Device

## Patient Management

1. Assess for possible pump malfunction
  - a. Assess for alarms
  - b. Auscultate for pump "hum" sound (best heard in the left chest)
  - c. Assess for signs of hypoperfusion including pallor, diaphoresis, altered mental status
2. If the VAD pump has malfunctioned:
  - a. Utilize available resources to troubleshoot potential VAD malfunctions and to determine appropriate corrective actions to restore normal VAD function
    - i. Contact the patient's VAD-trained companion, if available
    - ii. Contact the patient's VAD-coordinator, using the phone number on the device
    - iii. Check all connections to the system controller
    - iv. Change VAD batteries, and/or change the system controller if indicated
    - v. Have the patient stop all activity and assess for patient tolerance
    - vi. Follow the appropriate protocol for the patient's presenting complaint
3. If the patient is experiencing VAD-related complications or cardiovascular problems, expedite transport to the medical facility where the VAD was placed if the patient's clinical condition and operational considerations allow. If direct transport to the patient's VAD center is not possible, take the patient to the most appropriate facility based on their clinical condition, notifying OLMC and the patient's VAD coordinator of destination decision
  - a. If patient has a functioning VAD and is experiencing a non-cardiovascular-related problem, contact OLMC and transport to a facility that is appropriate for the patient's main presenting problem without manipulating the device



## Ventricular Assist Devices #2

A P

4. If the patient is in cardiac arrest
  - a. CPR should NOT be performed if there is any evidence the pump is still functioning. The decision whether to perform CPR should be based upon best clinical judgment. Consult OLMC **or** the patient's VAD coordinator for questions
  - b. CPR is indicated only when:
    - i. The patient's pump has stopped and troubleshooting efforts to restart the pump have failed, **AND**
    - ii. The patient is unresponsive with no detectable signs of life
5. Manage the patient's airway as indicated by **Blue 3**
6. Establish IV/IO access based on the patient's acuity and provider judgment
7. Place the patient on a cardiac monitor
8. Perform 12-lead ECG

### PEARLS for VADs

- You do not need to disconnect the controller or batteries in order to defibrillate or cardiovert.
- You do not need to disconnect the controller or batteries in order to acquire a 12-lead ECG.
- Automatic non-invasive cuff blood pressures may be difficult to obtain due to the narrow pulse pressure created by the continuous flow pump.
- Flow through many VAD devices is not pulsatile and patients may not have a palpable pulse or accurate pulse oximetry. The blood pressure, if measurable, may not be an accurate measure of perfusion. Although automatic non-invasive blood pressure cuffs are often ineffective in measuring systolic and diastolic pressure, if they do obtain a measurement, the MAP is usually accurate. Doppler's may be more accurate at determining both pulse and blood pressure and, if available, should be used.
- Patient may be awake with a functioning pump in VF, VT, PEA or asystole. If the patient is responsive **AND** the encountered rhythm is thought to be new, ACLS therapies, including defibrillation may be attempted, however chest compressions are not necessary if the patient is awake and alert. Evaluate clinical condition and provide care in consultation with VAD coordinator.
- The patient's emergency travel bag should accompany him/her at all times. If feasible, bring the patient's Power Module, cable and Display Module with patient to the hospital.
- The most common cause for VAD alarms are low batteries or battery failures
- Primary pump failure is a very rare occurrence. The most common VAD complications, in descending occurrence, are:
  - Infection
  - Bleeding
  - Arrhythmias
  - CHF
  - Aortic Insufficiency
  - Stroke/TIA
  - Cardiac Tamponade
- Follow the protocol most appropriate, based on the patient's clinical condition.
- For questions, contact OLMC and the patient's VAD Coordinator.
- All patients with a VAD are anticoagulated, typically with warfarin (Coumadin).



# Allergy/Anaphylaxis #1

## EMT

1. Manage airway as appropriate, see **Blue 3**
2. If shock present, refer to Medical Shock protocol, **Gold 14**
3. If anaphylaxis identified, assist administration of patient's own EPINEPHrine auto-injector, administer an adult or pediatric (as applicable) auto-injector, or provide EPINEPHrine through the Maine EMS Check and Inject program in the anterolateral thigh:
  - a. Adult: EPINEPHrine 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh, or
  - b. Pediatric dose of EPINEPHrine which is as follows: less than 25 kg, 0.15 mg **IM** [0.15mL of 1mg/mL], greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh
4. Request ALS, if available
5. Consider local measures to prevent absorption of allergen



## ADVANCED EMT

6. If anaphylaxis identified:
  - a. Adult: EPINEPHrine 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh, or
  - b. Pediatric dose of EPINEPHrine which is as follows: less than 25 kg, 0.15 mg **IM** [0.15mL of 1mg/mL], greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] **IM** in anterolateral thigh
7. IV en route
8. Cardiac monitor
9. If shock present, perform fluid bolus
10. Repeat **IM** EPINEPHrine doses every 5-15 min, call for a Paramedic and notify OLMC of incoming critical patient.



- 
11. If wheezing persists 5-15 minutes after first dose of EPINEPHrine contact OLMC for consideration of Albuterol.
- 



For patients with minor symptoms only or resolution of symptoms with a single dose of EPINEPHrine the AEMT, in consultation with OLMC, may consider canceling ALS.

## PARAMEDIC

12. Consider glucagon 1 mg **IV** q 5 minutes for patients taking beta-blockers and not responsive to EPINEPHrine
13. Diphenhydramine (Benadryl)
  - a. Adult: 25-50 mg **IV/IO/IM**
  - b. Pediatric: 1-2 mg/kg **IV/IO/IM** (max single dose of 50 mg)
14. Consider one of the following; may repeat x 1
  - a. Albuterol 2.5 mg by nebulization;  
-OR-
  - b. 1 mL of 1mg/mL EPINEPHrine nebulized with 2 mL of NS  
-OR-
  - c. 0.5 mL of 2.25% racemic EPINEPHrine solution nebulized with 2.5 mL NS



(Continued)



## Allergy/Anaphylaxis #2

15. Contact OLMC for repeat **IM** EPINEPHrine every 5 minutes and/or EPINEPHrine **IV infusion** for shock or cardiovascular compromise, which may typically be dosed the following way:



**Preparation** - Add 1mL (1mg) EPINEPHrine 1mg/mL to 250 mL bag NS. This results in a 1 mg/250 mL = 4 mcg/mL mix.

**Dose** - Start at 0.05 mcg/kg/min. Titrate by 0.05 mcg/kg/min every 5 min.

Titrate to desired effect which may include resolution of respiratory symptoms, SPB of > 90 mmHg and/or MAP > 65 mmHg.

**Usual dose** is 0.05-0.5 mcg/kg/min. Absolute maximum dose is 0.5 mcg/kg/min

**This must be performed with OLMC and administered via a Maine EMS approved medication pump.**

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### PEARLS for Allergy/Anaphylaxis

Children with a known, recent exposure to common triggers of allergic reactions (peanuts, medications, bee stings) should be considered at risk for having an allergic reaction or anaphylaxis.

Children with asthma should be considered high risk for a severe reaction.



Anaphylaxis in children should be treated for those exhibiting hypotension after exposure to a known allergen, respiratory compromise with acute onset of skin or mucosal involvement, or two or more of the following after exposure to a likely allergen: gastrointestinal symptoms, skin/mucosal involvement, respiratory compromise, or hypotension.

Severity should be differentiated between anaphylaxis and non-anaphylaxis (ie: Allergic reaction only). Only patients with anaphylaxis (as defined in **Gold 3**) should receive EPINEPHrine.

Evidence does not support the routine use of cardiac monitoring for patients who receive one dose of EPINEPHrine.

## Allergy/Anaphylaxis #3

### PEARLS for Allergy/Anaphylaxis:

1. Anaphylaxis is highly likely when any ONE of the following 3 criteria is fulfilled:

Acute onset of an illness (minutes to several hours) with involvement of the skin, mucosal tissue, or both (eg, generalized hives, pruritus or flushing, swollen lips-tongue-uvula) AND at least ONE of the following:

- a. Respiratory compromise (eg, dyspnea, wheezing- bronchospasm, stridor, reduced Peak Expiratory Flow (PEF), hypoxia)
- b. Reduced BP or associated symptoms of end-organ dysfunction (eg, hypotonia [collapse], syncope, incontinence)

OR

TWO or more of the following that occur rapidly after exposure to a likely allergen for that patient (minutes to several hours):

- a. Involvement of the skin-mucosal tissue (eg, generalized hives, itch- flush, swollen lips, tongue-uvula)
- b. Respiratory compromise (eg, dyspnea, wheeze-bronchospasm, stridor, reduced peak expiratory flow, hypoxia)
- c. Reduced BP or associated symptoms (eg, hypotonia [collapse], syncope, incontinence)
- d. Persistent gastrointestinal symptoms (eg, crampy abdominal pain, vomiting) (several hours)

OR

Reduced BP after exposure to known allergen for that patient (minutes to several hours)

- a. **Infants and children:** low systolic BP (age specific) or greater than 30% decrease in systolic BP
- b. **Adults:** systolic BP of less than 90 mmHg or greater than 30% decrease from that person's baseline



2. In every case when anaphylaxis is identified, EPINEPHrine should be provided. The best route of administration is via the **IM** route in the anterolateral thigh
3. Patients may require repeated doses EPINEPHrine. These repeated doses are also provided via the **IM** route
4. **DO NOT administer IM EPINEPHrine concentration (1mg/1mL) via the IV route.**

## Allergy/Anaphylaxis #4

**IV EPINEPHrine** infusion drip, administered via a Maine EMS approved medication pump, should be started for patients unresponsive to **IM EPINEPHrine** administration in either of the following settings:

- Cardiovascular collapse (hypotension with altered mental status, pallor, diaphoresis, or delayed capillary refill)

**OR**

- Hypotension that is unresponsive to a total of 60 mL/kg (3 x 20 mL/kg boluses) isotonic fluid boluses and repeat doses of **IM EPINEPHrine**

Evidence does not support the prophylactic use of EPINEPHrine in the asymptomatic patient after exposure to a known allergen.

Children experiencing cutaneous signs of an allergic reaction with no systemic symptoms should be evaluated by a medical provider.

Children experiencing anaphylaxis in the prehospital setting who receive EPINEPHrine require EMS transport.



# Coma

## (Decreased Level of Consciousness)

Assess for trauma, drugs, diabetes, breath odor, needle tracks, medical alert tags, suspected seizure. Refer to appropriate protocol for specific suspected conditions.

Consider SCENE SAFETY as there may be an environmental or toxicologic cause, especially if more than one patient has decreased level of consciousness.

### EMT

1. Immobilize spine if indicated
2. Manage airway as appropriate, see **Blue 3**
3. Request ALS, if available
4. If shock present, refer to Medical Shock protocol, **Gold 14**
5. Perform finger stick to measure blood glucose, if so trained. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**
6. If respirations less than 12 per minute AND narcotic overdose suspected, refer to Poisoning/Overdose protocol, **Yellow 1**

\*\*\*Never administer naloxone to a neonate\*\*\*

### ADVANCED EMT/PARAMEDIC

7. IV en route
8. Cardiac monitor

Differential Diagnosis of Coma	
A	Alcohol (and other drugs), Acidosis (hyperglycemic coma/DKA)
E	Electrolyte abnormality, Endocrine problem, Epilepsy
I	Insulin (diabetes/hypoglycemic shock)
O	Oxygen (hypoxia), Overdose (or poisoning)
U	Uremia (renal failure/insufficiency)
T	Trauma, Temperature (hypothermia, heat stroke)
I	Infection (meningitis, encephalitis, sepsis)
P	Psychogenic
S	Stroke, Space occupying lesions, Seizure, Shock

# Diabetic/Hypoglycemic Emergencies #1

## EMT

1. Manage airway as appropriate, see **Blue 3**
2. Request ALS, if available
3. **If trained**, perform finger stick to measure blood glucose
  - a. If blood glucose is less than 60 mg/dL, and patient is conscious and able to swallow, give glucose orally
4. **If not trained** to perform and patient is a known diabetic, has a known low blood sugar, or has an altered mental status, and if the patient is conscious and able to swallow, give glucose orally

**Glucose paste is to be administered as soon as possible if the patient is conscious and able to swallow and presenting with the signs/symptoms of a diabetic emergency**

## ADVANCED EMT

5. IV en route
6. If blood glucose is less than 60 mg/dL
  - a. If patient is conscious and able to swallow, give glucose **orally**, otherwise
  - b. Administer dextrose 25 gm **IV** (50 mL of 50% solution or 250 mL of D<sub>10</sub>W solution)
  - c. If under 40 kg give D<sub>10</sub>W as per the following:

Weight (Kg/Lbs)	Volume to be infused
10/22	50 mL
20/44	100 mL
30/66	150 mL
40/88	200 mL

- d. If IV unavailable, DO NOT PLACE IO
    - i. Administer glucagon 1 mg **IM**.
7. If blood glucose greater than 300 mg/dL, give NS fluid bolus
  8. Repeat glucose measurement in 5 minutes
  9. Cardiac monitor

## PARAMEDIC

10. Contact OLMC for OPTION of repeating dextrose, repeating glucagon, or placing an **IO**. If **IO** placed, administer dextrose 25 gm (250 mL of D<sub>10</sub>W) via **IO**



## Diabetic/Hypoglycemic Emergencies #2

### Pearls for Diabetes/Hypoglycemic Emergencies

- The definition of hypoglycemia has been changed from 80 mg/dL to 60 mg/dL based upon current literature which suggests most patients will experience adrenergic symptoms under 60 mg/dL and CNS symptoms under 50 mg/dL. If a patient's finger stick glucose measurement is above 60 mg/dL and hypoglycemia remains a concern, contact OLMC for treatment options.
- Goal of fluid bolus in hyperglycemia is to treat hypotension/signs of hypoperfusion as well as decrease blood glucose to less than 300 mg/dL.
- Hypoglycemic patients on sulfonylurea class medications (glipizide (Glucotrol), glyburide (Diabeta), etc.) may have refractory hypoglycemia and all require transport, glucose monitoring and hospital evaluation.

# Seizure #1

**PEARLS for Seizures:** Most seizures are self-limited. Unless a specific underlying condition exists (i.e. diabetes with hypoglycemia), treatment of a seizure or multiple seizures with a total duration of less than 5 minutes should focus on patient protection and oxygenation.

## EMT

1. Manage airway as appropriate, see **Blue 3**
2. Spinal immobilization as indicated. Refer to Spine Assessment protocol, **Green 6**
3. Left lateral recumbent position and protect patient from injury
4. Request ALS, if available
5. Perform finger stick to measure blood glucose, if so trained. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**

## ADVANCED EMT

6. Cardiac monitor
7. IV en route
8. If shock present, refer to Medical Shock protocol, **Gold 14**

## PARAMEDIC

9. If the patient has a single seizure lasting greater than 5 minutes OR recurrent seizure activity without recovery/return to baseline between seizures, administer IM midazolam if no IV is established. If an IV is established, administer midazolam via the IV route
  - a. Intramuscular dosing –
    - i. **Adult** - midazolam 10 mg **IM**
    - ii. **Pediatric** - midazolam 0.2 mg/kg IM to MAX dose of 10 mg
  - b. Intravenous/Intraosseous dosing
    - i. **Adult** - midazolam 5 mg **IV/IO**
    - ii. **Pediatric** - midazolam 0.1 mg/kg IV to a MAX dose of 5 mg
  - c. If Seizures continue, repeat midazolam at above doses **IV/IO/IM** q 5 min until resolution of seizure, for a total of: **Adult:** 20 mg **IM** total, 15 mg **IV** total; **Pediatric** 0.6 mg/kg **IM** with MAX cumulative dose of 20 mg, 0.3 mg/kg **IV** with MAX cumulative dose of 15 mg

- 
- i. Contact OLMC if additional midazolam is necessary
- 

- ii. Monitor oxygenation and ventilation with O<sub>2</sub> saturation and end-tidal capnography, especially if providing repeated doses of midazolam
- iii. Manage the patient's airway as necessary, see **Blue 3**





## Seizure #2

14. For patients visibly pregnant or less than 2 weeks postpartum
- Magnesium sulfate 4 gm **IV/IO** over 10 minutes
    - If IV/IO not available, magnesium sulfate 8 gm **IM** (4 gm in each buttock)
- 
15. Contact OLMC for the following OPTIONS:
- If repeated doses of midazolam necessary, unable to stop seizure activity, or if therapy beyond these protocols are necessary
- 



### PEARLS for Seizures:

- First dose of midazolam should be given IM unless an IV has already been established; do not delay treatment to start an IV.
- References for dosing of medications in seizures are in part from the article: \*Silbergleit, et al. "Intramuscular versus Intravenous Therapy for Status Epilepticus", New England Journal of Medicine, Feb 16, 2012, Vol. 366, No. 7.
- Contact OLMC for any patient requiring 3 or more doses of midazolam independent of the route provided.
- For patients with Vagus Nerve Stimulator who are having repeated/continuous seizure activity, consider activation of the Vagus Nerve Stimulator, if not already attempted, by holding the patients hand-held magnet over the Vagus Nerve Stimulator.

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# Stroke #1

Stroke should be suspected if any of the following have appeared in the last few hours or days: weakness on one side of face, weakness in one arm or leg, abnormal speech (slurred, incoherent, absent).

**Refer to the next page for early hospital notification process for patients who are potential stroke patients.**

See Coma protocol, **Gold 5**, if warranted.

See Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**, if warranted.

## Northern New England Stroke Screening Tool

Time Last Known Well: (if patient awoke with symptoms, last time known to be at baseline)

Witness Name and Best Contact Number:

### Prehospital Stroke Scale Examination

Please note: Normal Abnormal

**Facial Droop:** Have the patient smile and show teeth.

Normal: Both sides of the face move equally well.

Abnormal: One side of the face does not move as well as the other.

Normal

Abnormal

**Arm Drift:** Have the patient close their eyes and hold arms extended.

Normal: Both arms move the same, or both arms don't move at all.

Abnormal: One arm doesn't move, or one arm drifts down compared to the other.

Normal

Abnormal

**Speech:** Ask the patient to repeat a phrase such as "You can't teach an old dog new tricks".

Normal: Patient says the words without slurring.

Abnormal: Patient slurs words, says the wrong word, or is unable to speak.

Normal

Abnormal

**Blood Glucose:**

YES NO

**Stroke Alert Criteria - Please check Yes or No:**

☐
☐

Time from onset of symptoms is known to be less than 24 hours?

☐
☐

Blood glucose is or has been corrected to greater than 60 mg/dL?

☐
☐

Any abnormal finding on Prehospital Stroke Scale examination?

☐
☐

Deficit unlikely due to head trauma or other identifiable cause?

Stroke Alert Criteria - if YES to all criteria, contact receiving hospital and report a CODE STROKE.

**If Patient Screens Positive for Stroke Based on Facial Droop, Arm Drift or Speech Abnormalities,**

**Proceed to Next Page for Large Vessel Occlusion Screening**

# Stroke #2 - Large Vessel Occlusion Screening

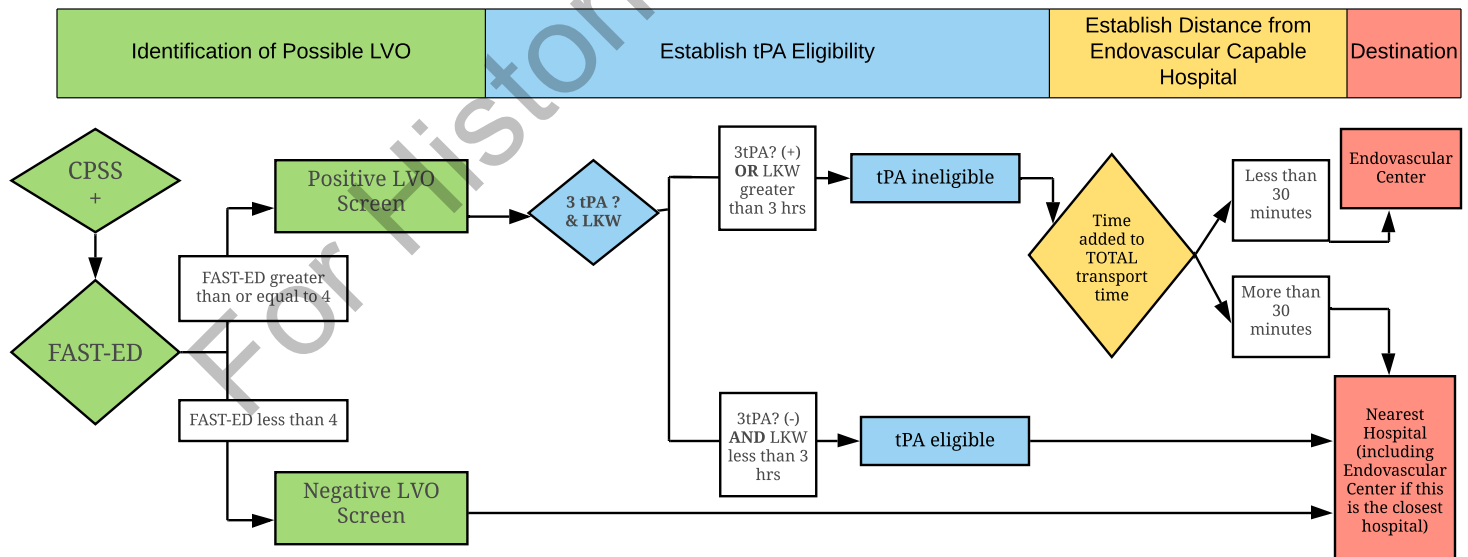
All patients who screen positive for stroke by presence of facial droop, speech abnormalities, or drift of the upper extremity should be screened for Large Vessel Occlusive stroke. These specific types of strokes *may* benefit from therapies in addition to IV tPA. Screening should be performed by all scopes of practice by using the Field Assessment Stroke Triage for Emergency Destination (FAST-ED) Screening Tool.

		0	1	2	Score
<b>F</b>	<b>Facial palsy</b> Ask the patient to smile	Normal or mild facial asymmetry	Obvious droop of one side of the mouth	N/A	
<b>A</b>	<b>Arm weakness</b> Extend the weak arm with palm facing down to 90° (if sitting) or 45° (if supine) and ask them to hold it there for 10 seconds	No drift down x 10 seconds	Drifts, but not all the way down	Drifts all the way down or no movement at all	
<b>S</b>	<b>Speech changes</b> Note spontaneous speech; ask the patient to name 3 common items; ask them to show you 2 fingers without demonstrating this visually to the patient	Normal speech	Impaired but comprehensible speech, and/or unable to name any of the items, and/or unable to follow the command	Incomprehensible speech and/or complete lack of understanding or mute	
<b>T</b>	<b>Time*</b>	N/A	N/A	N/A	Time LKW: _____
<b>E</b>	<b>Eye deviation</b> Observe the patient's horizontal eye movements	Normal eye movements	Eyes tend to only move to one side	Eyes both forced over to one side	
<b>D</b>	<b>Denial/Neglect</b> Touch the patient on both arms at the same time and ask if they feel both sides; Show the patient the hand on the side where there are symptoms of weakness and ask them "Whose hand is this?"	Able to sense touch on both sides at the same time and recognizes the weak hand as their own	Unable to feel one side of the touch but can recognize their weak hand as their own	Unable to feel one side of touch and does not recognize their weak hand as their own	
	<b>TOTAL SCORE</b>				

\*Time is documented for decision making purposes and is not scored.

A score of **greater than or equal to 4** has a sensitivity of 0.61 and a specificity of 0.89 for LVO (PPV 0.72)

## Destination Support Guidance for Possible LVO Stroke Patients:



**3tPA ?'s** refers to the tPA screening questions on **Gold 13**. If ALL are answered negative and time criteria are met, the patient is considered tPA eligible. If ANY are answered positive, the patient is tPA ineligible. **LKW** refers to the time the patient was Last Known Well and without the presenting stroke symptoms

## Stroke #3

### EMT

1. Manage airway as appropriate, see **Blue 3**
2. Maintain O<sub>2</sub> saturation between 94 - 99%
3. Elevate head of stretcher to 30 degrees (unless patient requires spinal motion restriction)
4. Request ALS, if available. Do not delay transport for ALS intercept. When operationally and medically feasible, limit scene time to 10 minutes or less.
5. Perform finger stick to measure blood glucose, if so trained. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**
6. As early as possible, alert the receiving hospital of a "Code Stroke"
  - a. Relay the following information:
    - i. Patient age and gender
    - ii. Identify the patient as a potential stroke patient
    - iii. The patient's neurologic deficits and the findings of the Cincinnati Prehospital Stroke Scale and FAST-ED Scale
    - iv. The "Time Last Known Well"
    - v. The patient's mental status
    - vi. The patient's vital signs and finger stick blood glucose results
    - vii. ETA
7. Transport to the most appropriate facility based on regional resources

### ADVANCED EMT/PARAMEDIC

8. Cardiac monitor
9. IV en route
10. Perform 12-lead ECG en route

### PEARLS for Stroke:

- Consider transporting a **witness, family member or caregiver** with the patient to verify the time of stroke symptoms onset. If the witness can not come with you, obtain the witness' best phone number and relay to receiving hospital staff.
- **Time Last Known Well** is the last time the patient was noted to be neurologically normal. If the patient was sleeping and wakes up with symptoms, time last known well is the last time the patient was seen to be normal. Check if the patient had gotten up and been at baseline during the night.
- **Suspect stroke** in patients with any of the following new symptoms or complaints: acute visual disturbance, altered mental state, difficulty with balance or coordination, difficulty with speech or understanding, severe headache, weakness or numbness on one side. Stroke should be suspected whenever a person has a sudden change in neurological function. More common symptoms of stroke are weakness or loss of sensation of the face, a limb or a side of the face and body, abnormal speech production (slurred or inappropriate use of words) or comprehension, dizziness/vertigo, uncoordinated movements of a limb, gait disturbance, loss of vision in one eye or one side of vision and/or sudden onset severe headache for no obvious reason.
- Consider **stroke mimics** including: migraine, hypoglycemia, seizures, intoxication, sepsis.
- The management of an LVO stroke is a COMBINATION of rapid provision of tPA AND endovascular therapies when a patient screens positive for an LVO stroke that is amenable for therapy. At present, BOTH therapies should be performed in as rapid as possible manner, highlighting the role of ALL hospitals in the care of stroke patients.

This protocol was developed in collaboration with the Northern New England Protocol Group.

## Acute Stroke #4

### Stroke Checklist

Time of symptom onset/Time Last Known Well: \_\_\_\_\_

Yes No

☐ ☐

**Has the patient had any recent trauma, surgeries or procedures in the last 3 months?**

If Yes, what was the procedure and when did it occur? Including:

- 1) Severe head trauma within the past 3 months
- 2) Intracranial or spinal surgery within the past 3 months
- 3) Major non-cranial surgery or trauma within 14 days with uncontrollable bleeding (e.g. internal organs)

☐ ☐

**Has the patient had any bleeding problems in the past?**

If Yes, what was the bleeding problem and when did it occur? Including:

- 1) History of spontaneous (non-traumatic) intracranial hemorrhage
- 2) GI malignancy or GI bleed within in the past 21 days

☐ ☐

**Is the patient taking any anticoagulants, including oral or injectable medications?**

If Yes, clarify what the medication is and when it was last administered. See below lists of common anticoagulants

This list represents a simplified approach to contraindications to tPA and should be inquired of all patients with suspected stroke. These are important to hospital providers determining eligibility for tPA AND when determining entry destination for possible LVO Strokes (referred to in the algorithm as 3tPA ?'s)

Please present these findings to the Emergency Medicine Staff at the receiving hospital. The patient's Last Known Well and the answers to these three questions identify the vast majority of ABSOLUTE contraindications for tPA. However, a positive answer to these questions does not absolutely rule out the ability to provide tPA.

#### **PEARLS for Anticoagulants:**

Patients may recognize their anticoagulants as "blood thinners". Inquire about traditional anticoagulants including warfarin (Coumadin or Jantoven) and Heparin (IV/IM - including Lovenox) as well as other oral anticoagulants, including dabigatran (Pradaxa), rivaroxaban (Xarelto), apixaban (Eliquis), betrixaban (Bevyxxa) or edoxaban (Savaysa). Please note, medication manufacturers are producing new anticoagulants frequently. Please note all medications the patient identifies as an anticoagulant and pass on to receiving hospital staff.

# Medical Shock #1

See Cardiogenic Shock, **Red 20** if appropriate  
See Hemorrhagic Shock, **Green 13** if appropriate  
See Allergy and Anaphylaxis, **Gold 1** if appropriate  
See Airway Algorithm, **Blue 3** if appropriate

## IDENTIFICATION OF POSSIBLE SEPSIS

- Suspected infection?
- Evidence of sepsis criteria? Includes **two or more** of the following:
  - Temperature less than 96.8 degrees F or greater than 101 degrees F
  - Heart rate greater than 90 bpm
  - Respiratory rate greater than 20 bpm
  - Systolic blood pressure less than 90 mmHg or Mean Arterial Pressure (MAP) less than 65 mmHg
  - New onset altered mental status OR increasing mental status change with previous altered mental status.
  - Pedi: Mottling, Cap refill less than 1 sec (flash) OR greater than 3 seconds (delayed)

## EMT

1. Attempt to identify cause
  - a. Hemorrhagic Shock, see **Green 13**
  - b. Cardiogenic Shock, see **Red 20**
  - c. Anaphylactic Shock, see **Gold 1**
2. Manage airway as appropriate, see **Blue 3**
3. Request ALS intercept, if available
4. Perform finger stick to measure blood glucose, if so trained
  - a. If blood glucose less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**
5. Transport

## ADVANCED EMT

6. For Severe Sepsis
  - a. Assess for acute pulmonary edema. If present, refer to Cardiogenic Shock protocol, **Red 20**
  - b. Adults: administer up to 30 mL/kg fluid bolus. Monitor closely during resuscitation.
  - c. Pediatrics: administer 20 mL/kg fluid bolus. Immediately reassess patient. If needed, may repeat up to 2 times (total of 60 mL/kg)  
Goals of resuscitation in shock and sepsis are to treat hypotension and/or signs of hypoperfusion.
  - d. Notify receiving hospital that the patient is a “Code Sepsis”





# Medical Shock #2

## PARAMEDIC

### 7. For medical or presumed septic shock

#### a. If no response to initial treatment:

- i. Contact medical control to discuss additional fluid bolus versus initiating NOREPInephrine **IV infusion**. NOREPInephrine infusions must be administered via a Maine EMS approved medication pump.

A. **Preparation** – mix NOREPInephrine 8 mg in 250 mL NS [32 mcg/mL]

B. **Dosing** - Starting dose of NOREPInephrine is 0.03 mcg/kg/min. Titrate by 0.03 mcg/kg/min every 3-5 minutes. Usual dose is 0.03-0.25 mcg/kg/min. Usual MAX dose is 0.6 mcg/kg/min. Absolute MAX dose is 3 mcg/kg/min.

C. **Titrate** to maintain SBP greater than 90 mmHg and/or MAP > 65 mmHg



### 8. Additionally, if the patient is found to have Adrenal Insufficiency (via medic alert bracelet, patient records, or family/staff reports), administer dexamethasone as follows:

a. **Adults** – dexamethasone 10 mg **IV/IO/IM** x 1 dose

b. **Pediatrics** - 0.6 mg/kg with MAX single dose of 10 mg **IV/IO/IM** x 1 dose

c. May provide patient's own dose of hydrocortisone (Solu-cortef) at the patient's physician's prescribed dose if patient's medications are available



## PEARLS for Sepsis:

- Sepsis is a systemic inflammatory response due to infection, often resulting in significant morbidity and mortality.
- Septic shock has a 50% mortality rate and must be treated aggressively.
- Treatment consisting of IV fluid administration and early antibiotic administration reduces mortality in septic patients.
- Please alert the receiving hospital with patients identified as septic.
- Current evidence suggests there may be a benefit from use of Lactated Ringers in critically ill patients with shock. Consider using Lactated Ringers preferentially if available.
- When initiating NOREPInephrine, make sure that the IV flushes easily and that there is NO extravasation.

This protocol was developed in collaboration with the Northern New England Protocol Group.

# Medical Shock #3

Pediatric shock is well established before the appearance of classic signs and symptoms. The earliest signs and symptoms of pediatric shock include delayed capillary refill, alterations in mental status, rising pulse, and increasing respiratory rate. By the time blood pressure drops, circulatory collapse is near. Consider sepsis in certain high-risk clinical settings.

High-risk features for invasive infection include malignancy, bone marrow or solid organ transplant, asplenia, presence of indwelling central line/catheter, or other situation with immune deficiency, compromise or suppression.

Please see below for pediatric specific findings & vital signs.



## IDENTIFICATION OF POSSIBLE SEPSIS

- Suspected Infection - YES
- Temperature greater than 101° F or less than 96.8° F (greater than 38.3° C or less than 36° C)
- Heart rate or respiratory rate greater than normal limit for age (NOTE: heart rate may not be elevated in a septic hypothermic patient) **AND** at least one of the following indications of altered organ function:
  - Altered mental status
  - Capillary refill time less than 1 second (flash) or greater than 3 seconds
  - Mottled cool extremities

Note: Consider early contact with **OLMC** for suspected pediatric sepsis patients

Upper Limit of Pediatric HR & RR		
Age	Heart Rate	Resp Rate
0 day-<1 mo	> 205	> 60
1mo - <3 mo	> 205	> 60
3 mo - <1 y	> 190	> 60
1y - <2 y	> 190	> 40
2y - <4y	> 140	> 40
4y - <6y	> 140	> 34
6y - <10y	> 140	> 30
10y - <13y	> 100	> 30
13 y or older	> 100	> 16

\*American College of Pediatrics "An Emergency Department Septic Shock Protocol and Care Guideline for Children Initiated at Triage"

## Medical Shock #4

### PEARLS for Medical Shock

Many pediatric patients with shock have associated hypoglycemia. Mortality is increased if this is not addressed. Also, the presenting symptoms of shock and those of hypoglycemia can be very similar.



In children under the age 6, prompt IO placement after one failed IV attempt should be considered, since timely, successful IV placement in this age group is shown to be difficult.

Patients in shock require frequent reassessment. The following physiologic parameters are appropriate endpoints for therapy: normalization of heart rate, capillary refill, mental status, resolution of existing hypotension and, if available, presence of urine output.

### PEARLS for Cardiogenic Shock

Pediatric patients suffering from suspected cardiogenic shock should receive boluses of 10 mL/kg with frequent reassessment for tolerance and need for additional fluids.

P

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# Abdominal Pain

Many diseases cause abdominal pain. While it is almost impossible to diagnose the cause of abdominal pain in the EMS environment, it is important to be prepared for the patient to suddenly become very ill. If the patient is in shock, refer to the medical shock protocol.

E

## EMT

1. Manage airway as appropriate, see **Blue 3**
2. If evidence of shock, refer to the Medical Shock protocol, **Gold 14**

## ADVANCED EMT

A

3. Establish IV
4. If so trained, perform 12-lead ECG, under the following circumstances:
  - 1) The patient has a history of cardiac disease or risk factors for cardiac disease, or
  - 2) Based on the provider's discretion

## PARAMEDIC

5. Perform pain-rating score on 1-10 scale
6. For non-traumatic abdominal pain in a stable patient with a normal level of consciousness:
  - a. Consider fentanyl 1 mcg/kg **IV/IN** for a MAX dose of 100 mcg

- 
- i. If repeated doses necessary, contact OLMC
- 



- b. For nausea or vomiting, refer to Nausea and Vomiting protocol, **Gold 19**

P

# Nausea and Vomiting

Nausea and vomiting are symptoms of some other illness. Therefore, this is a supplemental protocol to be used in addition to other relevant protocols

E

## EMT

1. Manage airway as appropriate, see **Blue 3**
2. Transport in position of comfort, unless contraindicated

## ADVANCED EMT

3. If so trained, perform 12-lead ECG under the following circumstances:
  - a. The patient has a history of cardiac disease or risk factors for cardiac disease, or
  - b. Based on the provider's discretion
4. Ondansetron 4 mg ODT **PO** x 1 (Do not administer if patient has history of long QT syndrome)
5. Establish IV Access
6. Consider fluid bolus if actively vomiting

A

## PARAMEDIC

7. **Adults:** administer ondansetron 4 mg ODT tablet **PO**, or ondansetron 4 mg **IV**
  - a. May repeat once after 15 minutes as needed.
8. **Pediatric patients::**
  - a. If greater than 4 years old, use the adult dose as above
  - b. If less than 4 years old, give 0.1 mg/kg **IV/IM** up to adult dose
9. Avoid IV unless hemodynamic status warrants fluid resuscitation



P

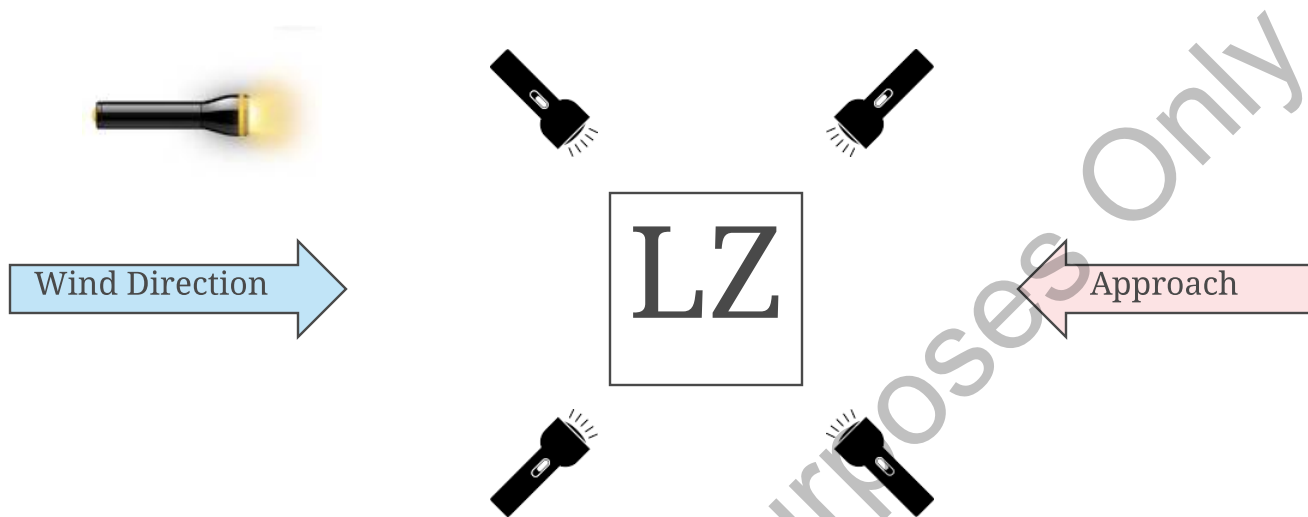
10. Contact OLMC for dosage question, abnormal vital signs, or coincident drug use (including alcohol) by patient.



### PEARLS for Management of Nausea and Vomiting:

A small percentage of patients receiving ondansetron experience adverse cardiac reactions including QT prolongation. For this reason, patients should be questioned about preexisting QT prolongation, which is a contraindication to receiving ondansetron. In these conditions, patients **SHOULD NOT** receive ondansetron. There are also many medications which may cause a prolonged QT interval and ondansetron should be withheld in these cases. For more information on drugs that can cause QT prolongation, consider reading: <https://www.uspharmacist.com/article/drug-induced-qt-prolongation>.

# Minimum Landing Zone (LZ) Area #1



## **Aircraft Arrival**

- Identify Scene and LZ Incident Command
- Establish radio communications prior to landing
- State Fire or State EMS are the default radio frequencies
- Advise pilot of terrain conditions, vertical obstructions, and wind direction
- Secure LZ and identify personnel to guard tail rotor guards
- Notify pilot if patient is packaged and ready for hot load.

## **Operating Around Helicopter**

- Approach aircraft with crew escort only
- Approach aircraft 90 degrees to door only
- Avoid tail boom and rotor at all times
- Eye and ear protection should be worn
- Do not carry anything above shoulder height
- Secure all loose medical and personnel equipment
- Spotlights, headlights, and/or hand-held lights should not be pointed directly at the helicopter.



## Minimum Landing Zone (LZ) Area #2

### **Terrain:**

- Flat, firm, free of debris
- Consider dust and snow
- LZ should be downwind of accident scene
- Free of vehicles and people
- Any markers must be able to withstand 60 mph winds
- Approach path only from down slope of aircraft

### **Vertical Obstructions:**

- Mark towers, antennas, poles, tall trees with vehicle
- Check the wind, helicopter must land and take off into the wind
- Ideal = clear approach and departure angle 8:1 (200' to 25' vertical obstruction)

### **Wires:**

- Electrical and utility wires are greatest single hazard to helicopters
- Search LZ area for wires
- Mark all wires, high-tension lines, guide wires with vehicles
- Notify pilot of all wires in proximity to landing zone

### **Lighting:**

- Never shine light directly at aircraft
- All emergency lights on until aircraft overhead
- Shut down vehicle strobes and white lights when aircraft on approach
- Keep working lights on minimum

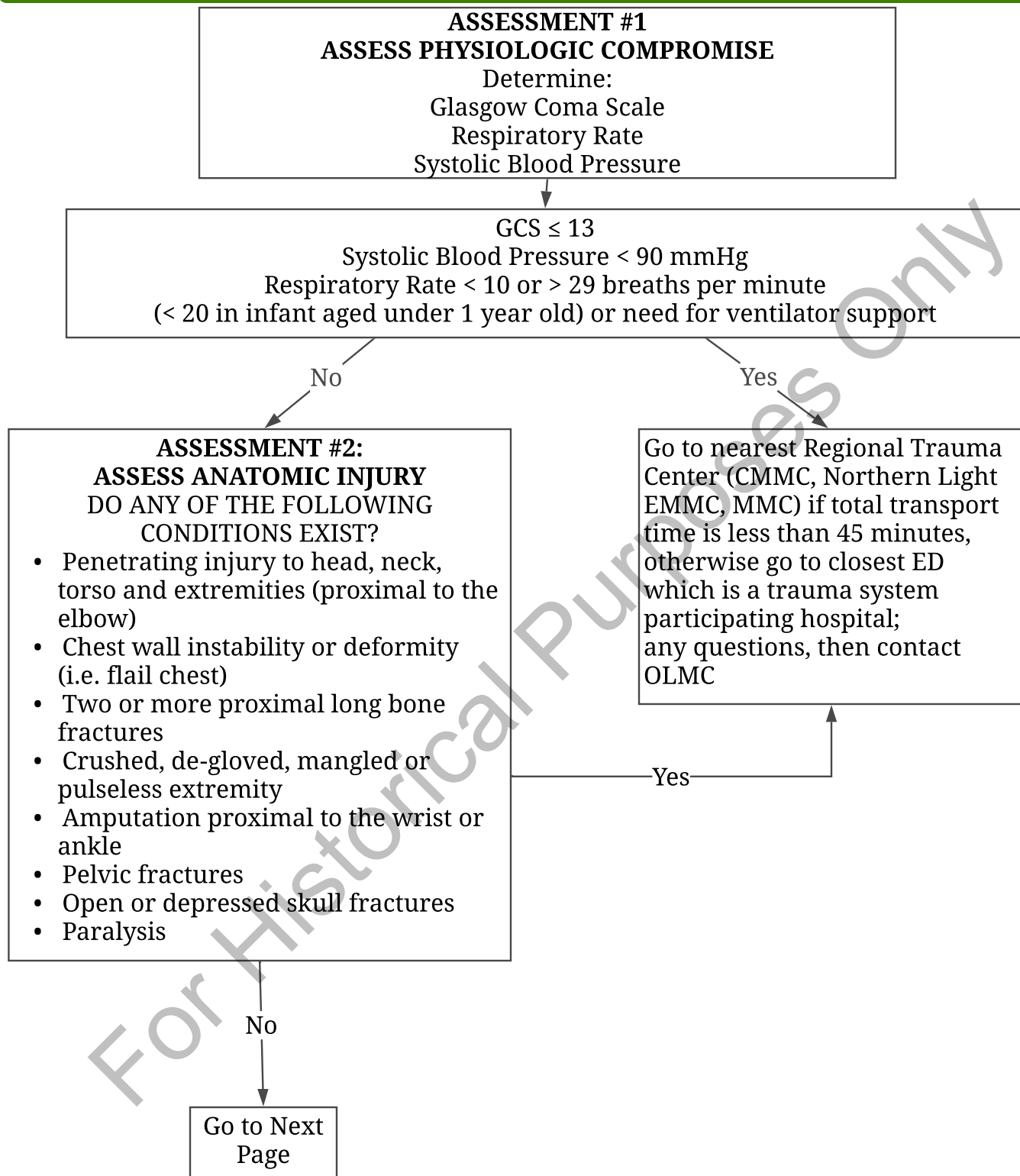
### **Aircraft Departure**

- Keep LZ clear for at least 5 minutes after helicopter departure
- In case of emergency the helicopter may have to return to LZ
- Keep communications open with pilot

**REMEMBER - EVERYONE IS RESPONSIBLE FOR SAFETY**

# Trauma Triage #1

## (Patient with Blunt or Penetrating Trauma)



# Trauma Triage #2

## (Patient with Blunt or Penetrating Trauma)

### ASSESSMENT #3

#### ASSESS MECHANISM OF INJURY AND EVIDENCE OF HIGH ENERGY IMPACT

1. Falls
  - a. Adults: > 20 feet (one story is equal to 10 feet)
  - b. Children: > 10 feet or 2-3 times the height of the child
2. High Risk Automobile Crash
  - a. Intrusion, including roof: > 12 inches occupant compartment, > 18 inches any compartment
  - b. Death in same passenger compartment
  - c. Ejection (partial or complete) from the automobile
  - d. Vehicle telemetry data consistent with high risk injury
3. Auto vs. pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact
4. Pedestrian thrown or run over by vehicle
5. Motorcycle crash greater than 20 mph

No

Yes

### ASSESSMENT #4

#### ASSESS SPECIAL PATIENT OR SYSTEM CONSIDERATIONS

##### Older Adults

- Risk of injury/death increases after age 55 years
- SBP < 110 might represent shock after age 65 years
- Low impact mechanisms (i.e. ground level falls) might result in severe injury

##### Children

- Should be triaged preferentially to a pediatric capable trauma center

##### Anticoagulant and bleeding disorders

- Patients with head injury are at high risk for rapid deterioration

##### Burns

- Without other trauma mechanism: triage to burn facility
- With trauma mechanism: triage to trauma center

##### Pregnancy > 20 weeks

##### EMS Provider Judgment

Consider transport to nearest Regional Trauma Center (CMMC, Northern Light EMMC, MMC) if total transport time is less than 45 minutes vs. transport to the closest ED, which is a trauma system participating hospital; any questions, then contact OLMC

Yes

No

Transport to Trauma System Participating Hospital

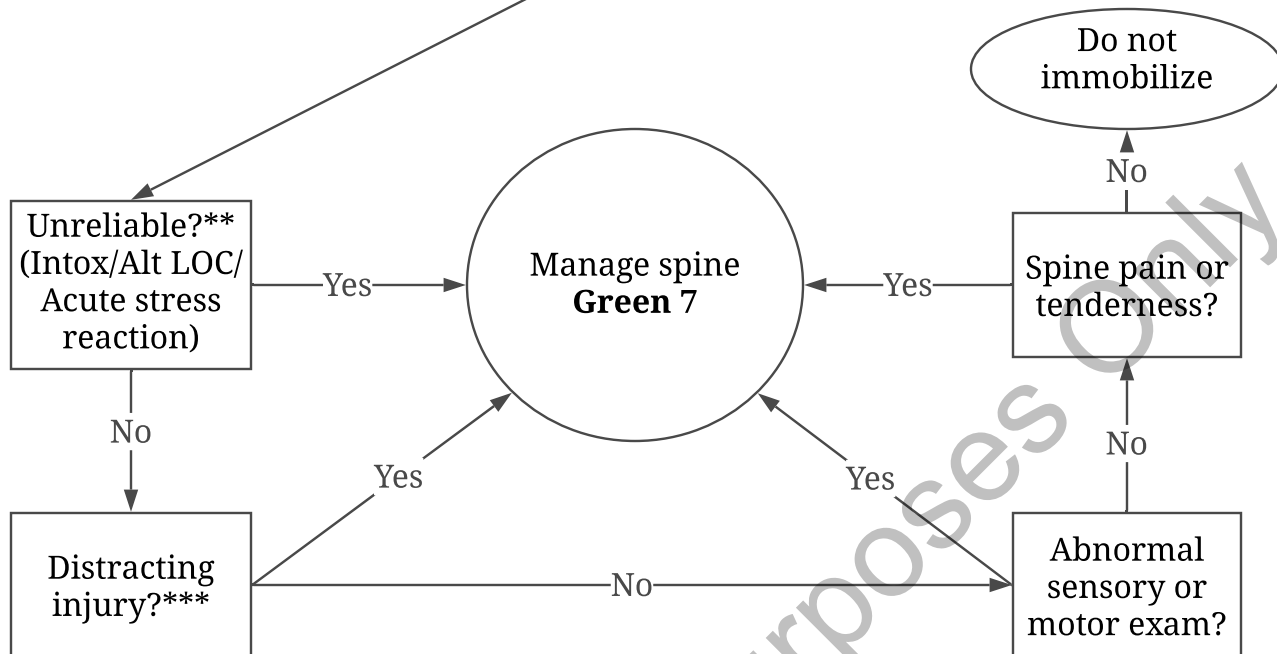
## Trauma Triage #3 (Patient with Blunt or Penetrating Trauma)

1. OLMC considers patient transport to Regional Trauma Center (RTC) using the following guidelines:
  - a. If patient would best be served by RTC and transport time less than 45 minutes, then OLMC may direct you to the RTC
  - b. If patient requires RTC but transport time greater than 45 minutes or patient requires life saving interventions, patient to go to the closest ED
2. If upon arrival to ED:
  - a. Facility is not an RTC and
  - b. Patient continues to satisfy criteria of Assessments #1 and #2, and
  - c. Patient can be stabilized for further transport, then the sending ED clinician should follow the regional/state trauma plan

If prehospital providers are unable to definitively manage the airway, maintain breathing or support circulation, begin transport to most accessible hospital and simultaneously request ALS intercept or tiered response.

# Spine Assessment

Suspected spinal injury - Based on complaint and mechanism of injury\*



\* High risk mechanisms of injury in the pediatric population include, but are not limited to, the following: motor vehicle collisions, recreational vehicles (all-terrain vehicles and snowmobiles), axial loading, substantial torso injuries, and falls greater than 10 feet.



\*\* Clearance of the spine requires the patient to be calm, cooperative, sober, and alert. Note that the smell of alcohol on the breath is not necessarily the same thing as intoxication; a single beer can be detected on the breath, but does not necessarily cause significant intoxication. The real question is not about the presence or absence of any alcohol, etc.; it is whether or not the patient and the exam are reliable.

\*\*\* Distracting injury includes any injury that produces clinically apparent pain that might distract the patient from the pain of a spine injury. The real question is not about the presence or absence of any other injuries, it is whether or not the patient and the exam are reliable.

Remember that patients can fracture the spine at any level, not just the C-spine. If a fracture at another level of the spine is suspected, the *entire* spine must be immobilized, including the cervical spine. Patients with thoracic or lumbar fractures will commonly have associated cervical spine injuries.

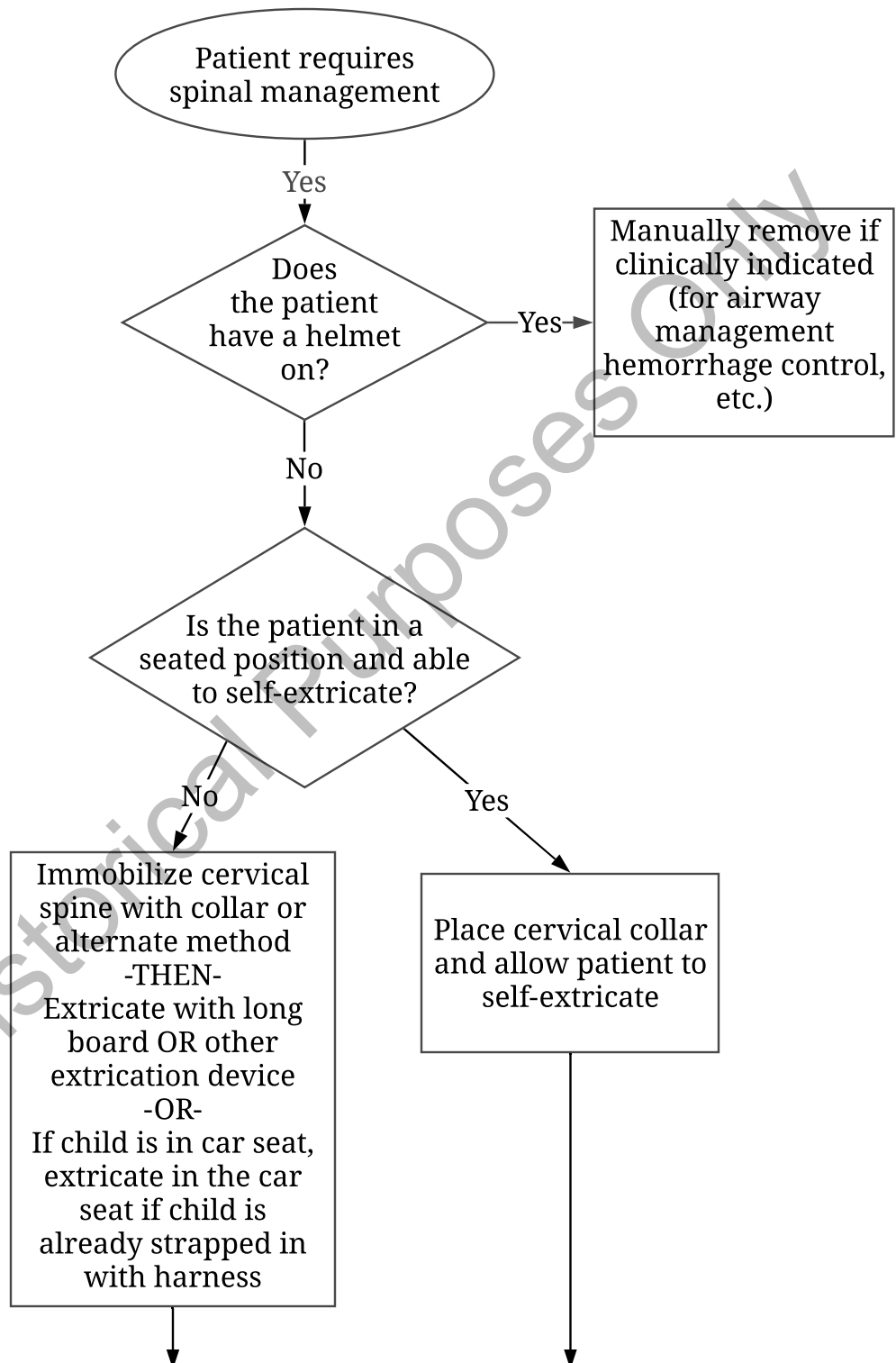
# Spine Management #1

\* Patients are able to self-extricate from a motor vehicle or seated position to an EMS litter when **all** of the following conditions are met:

1. Able to reliably follow commands including instructions to maintain neutral spine position
2. Without injury that would preclude patient from ambulating
3. The patient ambulates as *little* as possible. Ultimately the EMS litter should be in close proximity to the patient

Patients in the lying position should be moved to the EMS litter by scoop/long board or other similar device.

Only patients in a seated position (i.e. a vehicle) are candidates for self-extrication. Proper methods of self-extrication limit patient movement as much as possible. For instance, patient movement should be limited to standing and pivoting to the litter. Please use caution when considering self-extrication and recognize that some vehicles are difficult to self-extricate from. Use judgment when considering self-extrication, recalling the goal of minimizing spine movement. If, in your judgment, self-extrication would lead to more spine motion than an alternate method of extrication, proceed with the alternate method.



Once patient is on the EMS litter, remove the long board UNLESS safe transport requires the use of a long board (see PEARLS). Transfer patient to appropriate hospital based on trauma triage decisions. If patient is in a car seat, see Pediatric Transportation protocol, **Pink 9**.



# Spine Management #2

## PEARLS for Spine Management

**Role of Backboards** - While the MDPB is attempting to limit the use of backboards, prehospital and hospital providers should recognize that there remain circumstances in which use of a backboard is appropriate. Backboards should be utilized to extricate patients from vehicles or other situations when they are unable to extricate themselves (critical patients, patients with lower extremity injuries, severe head injuries, etc.). In most instances, once on the EMS litter, the backboard is redundant and can be removed. However, in some settings, it may be appropriate for the backboard to remain. Those settings include, but are not limited to the following:

1. Cases in which the backboard is being utilized as an element of the splinting strategy (such as multiple long bone fractures)
2. Cases in which the patient is at risk for vomiting but unable to protect their own airway (such as intoxication, head injury, etc.) and may need to be turned to the side for airway protection during transport.
3. Cases in which the patient is unresponsive or agitated (i.e. head injury)
4. Cases in which removal of the backboard would otherwise delay transport to definitive care in a critical patient

**Preferred Position** - The preferred position for all patients with spine management is flat and supine. There are two circumstances under which raising the head of the bed should be considered:

- a. Patients in respiratory distress. Populations at risk for developing respiratory distress when laying flat include the elderly with underlying lung disease, patients with morbid obesity and late-term pregnant patients
- b. Patient with suspected severe head trauma

Under these circumstances, consider raising the head of the bed to no more than 30 degrees

**Inter-Facility Transport** - Long backboards do not have a role in the transport of patients between hospitals EVEN IF SPINE INJURY IS DIAGNOSED. Use of long boards during inter-facility transport is associated with increased pain and potential for pressure sores and ulcers. Patients should instead be managed with a cervical collar (if appropriate) and firmly secured to the EMS stretcher. If a sending facility has placed the patient on a long board or requests use of a long board, EMS providers should discuss the option of foregoing backboard use with the sending physician. If a back board is used, it must be padded adequately to maximize patient comfort.

**Penetrating Injury** - The incidence of incomplete, unstable spine injury in penetrating trauma is low. Spine immobilization on a backboard is associated with an increased risk of death in patients with penetrating injuries to the neck, especially gun shot wounds, due to unrecognized hemorrhage and airway compromise. Spine immobilization does not appear to prevent progression of neurologic injury in cases of penetrating cervical trauma and may negatively affect patients with vascular and airway injuries. Penetrating trauma such as a gunshot wound or stab wound should not be immobilized on a long board and should instead be secured firmly to the EMS litter. Emphasis should be on airway and breathing management, treatment of shock, and rapid transport to a Level 1 or 2 Trauma Center.

### Special Patient Populations

- Caution should be exercised in older patients (i.e. 65 years and older) and in very young patients (i.e. less than 3 years of age), as spinal assessment may be less sensitive in discerning spinal fractures in these populations. However, age alone should not be a factor in decision-making for prehospital spinal care, rather the patient's ability to reliably provide a history should be considered.
- In children using a booster seat or lap/shoulder belt during a motor vehicle collision, consider allowing the patient to self-extricate him/herself after applying a cervical collar, if needed. For the infant or toddler who is already strapped in a car seat with a built-in harness, extricate the child while strapped in his/her car seat.
- Children who do not require spinal immobilization or lying flat may be safely transported when restrained in an age-appropriate car seat secured to the stretcher. Children who do require spinal immobilization or lying flat should be directly secured to the stretcher.

**Helmet Use** - Padding should be applied, if necessary, to maintain neutral cervical spine positioning depending on the type of sports helmet and presence or absence of shoulder pads.

**Management** - In patients who have suffered a potential spinal injury and need to be moved onto or off of a backboard, consider using the lift and slide technique rather than the log roll technique, when feasible.

# Glasgow Coma Scale

Adult	Pediatric	Score
<b>Eye Opening Response</b>	Same as Adult	
Open spontaneously		4
Open to voice command		3
Open to painful stimuli		2
Eyes remain closed		1
<b>Best Motor Response</b>	Same as Adult	
Moves on command		6
Pushes painful stimuli away		5
Withdraws from painful stimuli		4
Decorticate (flexion)		3
Decerebrate (extension)		2
No motor response to pain		1
<b>Best Verbal Response</b>		
Oriented	Appropriate words or social smile, fixes and follows	5
Confused	Cries but consolable	4
Inappropriate words	Persistently irritable	3
Incomprehensible sounds	Restless, agitated	2
No sounds	None	1
<b>Total</b>		3-15

# Chest Trauma

## EMT

1. O<sub>2</sub>, as appropriate
2. Assist ventilations (PPV), if needed
3. Request ALS, if available
4. Impaled Objects
  - a. Secure in place with bulky dressings
5. Open chest wound
  - a. Cover with thick, bulky dressing (i.e. abd pad or bulky trauma dressing) and secure in place
    - i. Monitor for persistent air leak and add additional dressings or consider occlusive dressing and one-way valve, if needed
6. Flail segment with paradoxical movement and respiratory distress
  - a. Consider PPV

## ADVANCED EMT

7. IV en route
8. If shock present, perform fluid bolus
9. Cardiac monitor and consider ECG, if so trained
10. Request Paramedic, if available

## PARAMEDIC

12. For presumed tension pneumothorax, perform chest decompression

**NOTE:** Chest decompression will be performed on the involved side using a Maine EMS-approved device. Chest decompression should be preferentially performed at the fourth or fifth intercostal space on the anterior axillary line. The second or third intercostal space on the mid-clavicular line may be used, if necessary.

## PEARLS for Chest Trauma

- The fourth to fifth intercostal space on the anterior axillary line is preferred to the second or third intercostal space on the mid-clavicular line because of significant failure rates of the mid-clavicular approach (24-54% failure rate at the mid-clavicular line vs. 8-22% of the time for anterior axillary approach). This is, in part, due to a larger average depth to the thoracic cavity at the mid-clavicular line vs the anterior axillary line.
- All needle decompressions are at risk of kinking/clotting or not reaching the thoracic cavity. Patients undergoing needle decompression should be monitored for change in symptoms after the procedure. If concern for needle decompression failure arises, repeat the procedure and continue monitoring. If the initial procedure site was the mid-clavicular line, consider repeating at the anterior axillary line.

# Head Trauma

## EMT

1. Consider immobilizing the spine
2. Manage airway as appropriate, see **Blue 3**
3. O<sub>2</sub> as appropriate; maintain O<sub>2</sub> sats between 94-99%.
4. If necessary to support ventilation, provide PPV at 10-12 breaths per minute  
\*\* It is important to neither hypoventilate or hyperventilate these patients\*\*
5. If not in shock, elevate head of bed to 30 degrees while maintaining spinal immobilization
6. Treat for shock, if indicated
7. Request ALS, if available and patient has altered mental status or abnormal vital signs

## ADVANCED EMT

8. IV en route
9. If shock present, perform fluid bolus to maintain BP greater than 110 mmHg
10. Cardiac monitor

## PARAMEDIC

11. Manage seizures as per Seizure protocol, **Gold 8**
12. Monitor for signs of herniation. If concern for herniation arises, alert the receiving hospital and hyperventilate to ETCO<sub>2</sub> of 30-35 mmHg as a short term option. This should **ONLY** be performed in severe head trauma *with signs of herniation*.



## PEARLS for Head Trauma

- Signs of herniation include the following: decreased level of consciousness PLUS abnormal respiratory pattern, asymmetric/unreactive pupils, decorticate or decerebrate posturing, and Cushing's response (bradycardia and hypertension). These patients typically have severely altered levels of consciousness with a GCS between 3 and 8.
- Hyperventilation is a short term solution for herniation by causing cerebral vasospasm. In addition to the beneficial results of limiting blood flow to the brain, this also decreases oxygenation and should therefore **ONLY** be performed when the benefits of decreased blood flow outweigh the risk of decreased oxygenation.
- Hyperventilation **MUST** be targeted to 30-35 mmHg and therefore **MUST** be performed with ETCO<sub>2</sub> monitoring.
- Alert receiving hospital of any head injured patient when concern for herniation arises.

# Hemorrhage

## EMT

1. Ascertain all sites of bleeding and control with direct pressure
2. If life-threatening bleeding is on extremity and uncontrolled with direct pressure, consider applying a Maine EMS-approved tourniquet
  - a. Tourniquets should be applied proximally on the affected limb for the following reasons:
    - i. Injuries are commonly more proximal than anticipated, and
    - ii. Double-bone structures in both the forearm and the lower leg effectively splint the arteries and prevent tourniquets from working properly
  - b. Tourniquets should be as tight as possible
    - i. Due to associated pain, request ALS, if available
  - c. If hemorrhage continues after application of the tourniquet, ensure the tourniquet is applied as tightly as possible. If hemorrhage continues, consider placement of a second tourniquet, proximal to the first. Experience has shown applying two tourniquets greatly reduces the incidence of hemorrhage, especially in injuries to the lower extremity
3. If life-threatening bleeding is not controlled by the above or is located in an area not amenable to placement of a tourniquet, consider applying a Maine EMS-approved hemostatic agent by packing the agent in the wound and applying/maintaining pressure over the agent for a minimum of 5 minutes. Check for ongoing bleeding. If bleeding has stopped, bandage appropriately; if bleeding continues, reapply pressure for a minimum of 5 minutes. If bleeding continues after the second period of pressure, remove the initial hemostatic agent and repeat with a new hemostatic agent. Remember, for these agents to have maximal effectiveness, they must be packed inside the wound as close to the bleeding source as possible
4. Treat for shock, if indicated, and manage airway as appropriate
5. If amputation, rinse severed part briefly and gently with sterile saline to remove debris
  - a. Wrap severed part in sterile gauze, moisten with sterile saline (do not soak), place in a water-tight container. Place container on ice (do not use dry ice). Do not put part directly on ice. If necessary, use ice packs to provide some level of cooling
6. Request Paramedic if bleeding cannot be controlled, patient demonstrates signs or symptoms of shock, or the patient requires pain management due to tourniquet placement

## ADVANCED EMT /PARAMEDIC

7. IV en route (refer to Hemorrhagic Shock protocol, **Green 13**).
8. Cardiac monitor



# Hemorrhagic Shock #1

If history of illness or mechanism of injury consistent with signs/symptoms of shock (elevated pulse, elevated respiratory rate, cool/pale skin, altered LOC, anxiety, sweating or lowered BP) then transport as soon and as efficiently as possible.

If the cause of the shock is:

Anaphylaxis, refer to the Anaphylaxis protocol, **Gold 1**

Cardiogenic, refer to the Cardiogenic Shock protocol, **Red 20**

Tension Pneumothorax, refer to the Chest Trauma protocol, **Green 10**

Medical Shock, refer to the Medical Shock protocol, **Gold 14**

E

## EMT

1. Control bleeding, refer to Hemorrhage protocol, **Green 12**
2. Manage airway, as appropriate; see **Blue 3**
3. If patient is in third trimester of pregnancy:
  - a. Place patient on left lateral recumbent side and re-evaluate
  - b. If shock is secondary to trauma, immobilize patient on a spinal board before placing in left lateral recumbent position (manually displace uterus to the left if tilting the board is not possible)
4. Request ALS

## ADVANCED EMT

5. IV en route
6. Cardiac monitor
7. If shock present (see below table), perform fluid bolus according to the following guidelines:
  - a. **Pediatrics** – establish IV access and perform 20 mL/kg fluid bolus. Repeat, as needed, within 15-30 min
  - b. Uncontrolled bleeding: for suspected internal bleeding or uncontrolled bleeding, fluid bolus to maintain target systolic BP of 90 mmHg
  - c. Suspected TBI/CNS injury: fluid bolus to maintain BP *greater than* 90 mmHg



A

8. Contact OLMC if patient is older than 65 years of age for fluid bolus order



## PARAMEDIC

9. The paramedic may perform all above treatment without medical control
10. Contact OLMC if blood pressure remains less than 90 systolic after fluid boluses
11. In patients with penetrating or blunt injury and:
  - are greater than or equal to 16 years of age, and
  - are hemodynamically unstable as evidenced by tachycardia, hypotension or other evidence of shock, and
  - who are less than 180 minutes (3 hours) from time of injury, consider:
    - a. Tranexamic acid (TXA) 1 gm IV mixed in 250 mL of NS over 10 minutes.
      - i. **CONTRAINDICATIONS** listed on **next page**

P

Discuss use of TXA in patients on anticoagulation with OLMC before providing medication.





## Hemorrhagic Shock #2

### CONTRAINDICATIONS for tranexamic acid (TXA):

- **Isolated** head injuries (multi-trauma patients with hemorrhagic shock **SHOULD** receive TXA regardless of head injury),
- Patients greater than 24 weeks pregnant (or pregnant with fundus above umbilicus),
- Patients with known hypercoagulable states,
- The patient is more than 180 minutes (3 hours) from the time of injury.

### PEARLS for the use of TXA:

Tranexamic acid is a lysine analogue that competitively binds to plasminogen therefore interrupting interactions with fibrin and preventing fibrinolysis or clot break down. Patients in hemorrhagic shock from either blunt or penetrating trauma may benefit from Tranexamic acid (TXA). TXA must be provided as soon as possible, preferably within 1 hour of injury and absolutely before 3 hours from injury.

Please ensure that receiving hospital staff:

1. Know the **time of injury**,
2. Are aware that the patient **received TXA**,
3. Are aware of the **1 gram dose** as the patient may need to be re-dosed upon arrival, and
4. **Flag the IV line** that the patient received TXA through with a labeled piece of tape as some medications and blood products should not be provided through the same line.

Additionally, discuss the use of TXA in patients on anticoagulants as these patients may require anticoagulation reversal and the combination of TXA and some of the reversal agents may have additive thrombotic effects. There are few adverse effects of this medication. TXA may cause hypotension if provided rapidly. The full dose should be provided over 10 minutes to prevent hypotension.

If the cause of hypovolemic shock is felt to be secondary to acute unstable pelvic fracture, the EMT, AEMT, or Paramedic may consider using a Maine EMS-approved pelvic stabilization device. If Maine EMS-approved pelvic binder is not available, consider immobilization with a sheet wrap.

Current evidence suggests there may be a benefit from use of Lactated Ringers in critically ill patients with shock. Consider using Lactated Ringers preferentially, if available.

Classification of Hemorrhagic Shock

	Compensated Shock	Mild Shock	Moderate Shock	Severe Shock
Blood Loss	<15% (1000 mL)	15-30% (1000-1500 mL)	30-40% (1500-2000 mL)	>40% (>2000mL)
Pulse	Normal	Elevated (>100)	Elevated (>120)	Elevated (>140)
Blood Pressure	Normal	Orthostatic Change	Marked Fall	Profound Fall
Cap Refill	Normal	May be Delayed	Usually Delayed	Always Delayed
Respiration	Normal	Mild Increase	Moderate Tachypnea	Marked Tachypnea and Respiratory Collapse
Mental Status	Normal or Agitated	Agitated	Confused	Lethargic/ Obtunded

# Burn #1

## EMT

1. Remove burned clothing and/or jewelry, unless adhered to patient
2. O<sub>2</sub>, as appropriate
3. Give highest priority to airway problems and major trauma
4. Manage shock, if present
5. Cover burn with dry dressing, sterile sheet, or commercially prepared dry dressing
6. Request ALS where there is a possibility of respiratory compromise, shock, burns greater than 10% BSA or need for pain medication

## ADVANCED EMT

7. Venous access en-route, IV/IO
8. Cardiac Monitor (avoid placing leads on burned skin)
9. If shock present, perform fluid bolus
10. If shock NOT present, deliver fluid boluses as follows
  - a.  $0.25 \times \text{wt (kg)} \times \% \text{BSA} = \text{mL/hr}$  (this represents the patient's fluid requirement each hour for the first 8 hours after the burn)

## PARAMEDIC

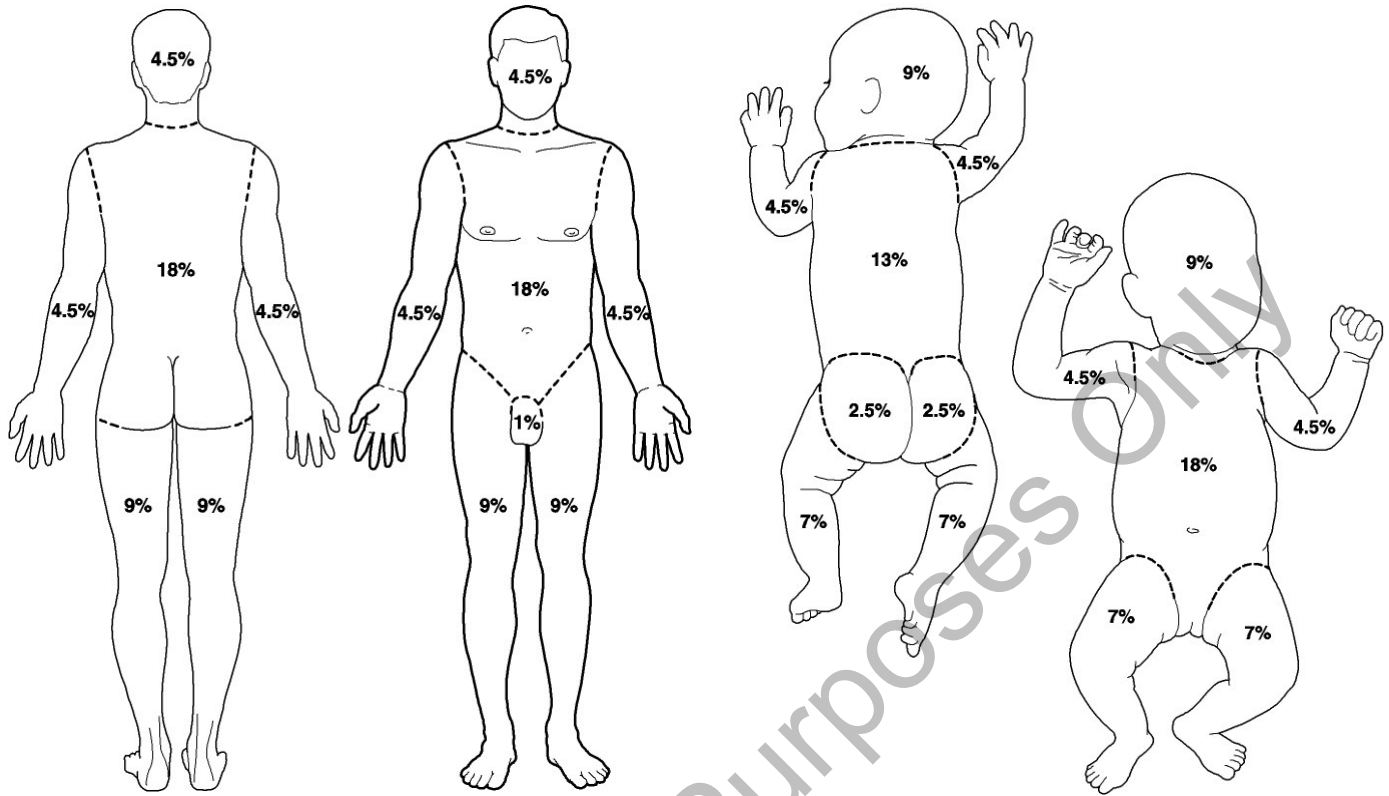
11. For pain control, refer to the Universal Pain Management protocol, **Green 17**

### PEARLS for Burn Management

- Only second (partial thickness) and third (full thickness) degree burns are counted when calculating burn surface area. Do not include first degree burns (superficial thickness).
- Errors are made in burn surface area calculation when an entire limb is counted despite only partial involvement. Consider using the patient's hand size (palm PLUS fingers = 1% BSA) to estimate 1% body surface area.
- Clean, dry dressings are adequate for covering all burns, regardless of size.
- It is preferable to establish IV access in non-burned tissue, but, if necessary, burned tissue may be used as a site for IV access.

## Burn #2

### Rule of 9's Estimation of Burned Body Surface (Percent)



**Remember: The patient's hand (palm PLUS fingers) is about 1% of the patient's body surface area.**

# Universal Pain Management #1

## Patient Inclusion Criteria

Adult and pediatric Patients who are experiencing pain either from a traumatic injury or with non-traumatic chest, abdominal, or flank pain. Contact OLMC for any other painful conditions including but not limited to back pain, headache, and non-traumatic extremity pain.

## Patient Exclusion Criteria

Change in baseline mental status or head injury with change in mental status from baseline. See number 9 for treatment options

For suspected cardiac chest pain, refer to Chest Pain - Suspected Cardiac Origin protocol, **Red 2**

## EMT

1. Verbal reassurance
2. Splinting as needed, provide in-line stabilization. Consider ice application in isolated extremity trauma if hypothermia/frostbite is not an issue
3. Evaluate pain using age appropriate pain scale
4. Request ALS for pain management

## ADVANCED EMT

5. Consider IV access in preparation for ALS pain management
6. Consider cardiac monitoring based on patient assessment

- 
7. If pain not improved and no contraindications to oral medications exist, contact OLMC for option of acetaminophen chewable tab, 10 mg/kg rounded to the nearest 80 mg (may be chewed or swallowed whole).
- 

## PARAMEDIC

8. Paramedics may perform all above treatment without medical control
9. For stable patients suffering pain from trauma or other listed inclusion criteria, consider the use of fentanyl 1 mcg/kg **IV/IM/IN** with an initial MAX dose of 100 mcg.
  - i. For persistent traumatic pain, may repeat doses every 5-10 minutes at 0.5-1 mcg/kg (MAX dose 100 mcg) **IV/IM/IN** titrated to effect, with a cumulative MAX dose of 5 mcg/kg

- ii. For non-traumatic pain, contact OLMC if additional dosing necessary.
- 

- a. Alternative pain control: 50% nitrous oxide/oxygen mixture self administered (i.e. Nitronox). (Contraindicated in suspected pneumothorax)
  - i. NOTE: Patients should NOT receive opioids AND Nitronox together for pain control due to additive adverse effects with administration of combined medications

(Continued)

# Universal Pain Management #2

(continued)

- c. For pain not controlled with fentanyl or for patients with a fentanyl allergy, contact OLMC for the following options:
  - i. Ketamine 0.2 mg/kg **IV** to a MAX dose of 25 mg
    - 1. Repeat every 15 minutes as needed for pain to a cumulative MAX dose of 1 mg/kg
  - ii. Ketamine 0.5 mg/kg **IN** to a MAX dose of 25 mg
    - 1. Repeat 0.25 mg/kg **IN** in 15 minutes as needed for pain x 1
- d. Contact OLMC if further dosing needed or vital signs are not stable. For dosage questions, abnormal vital signs, coincident drug use (including alcohol) by patient, or if IV cannot be established, contact OLMC before administering pain medication.
- e. For nausea or vomiting, administer ondansetron 4 mg **IV** or ondansetron 4 mg ODT **PO** and may repeat once after 15 minutes if needed. For dosage question, abnormal vital signs, coincident drug use (including alcohol) by patient, contact OLMC before administering medication

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## Special Circumstances

- 9. Contact OLMC before using any narcotic, antiemetic, or anxiolytic for isolated trauma involving head, any patient with mental status changes or in patients with unstable vital signs (including Systolic BP less than 100 mmHg). Use narcotics, antiemetics, and anxiolytics with caution in those with hypotension, bradypnea, or if coincident drug use (including alcohol) by patient.
  - a. Consider the use of fentanyl 1 mcg/kg **IV/IM/IN** initially with an initial MAX dose of 100 mcg, then 25-75 mcg **IV/IM/IN** every 5-10 minutes titrated to effect with cumulative MAX dose of 5 mcg/kg
  - b. For nausea or vomiting, administer ondansetron 4 mg **IV** and may repeat once after 15 minutes, if needed
  - c. Consider self-administered fixed-dose of 50% nitrous oxide/oxygen mixture delivered by commercially available device (such as Nitronox). (Contraindicated in suspected pneumothorax)
    - i. Note: Patients should NOT receive opioids AND Nitronox together for pain control due to additive adverse affects with administration of combined medications
- 10. Transport in position of comfort and reassess pain, as indicated

### PEARLS for Pain Management:

Acute pain management is often considered to be a “ladder” process; that is, start at the bottom rung and increase the “strength” AND risk of interventions in a stepwise fashion similar to climbing the rungs of a ladder. Therefore, it is expected that all providers, regardless of license level, will manage patients in the stepwise fashion to the maximum scope of practice of their licenses.

# Universal Pain Management #3

(continued)

Pediatric considerations:

Have the patient rate his/her pain from 0-10, or on an another appropriate pain scale:

- Ages less than 4 years, use FLACC Scale
- Ages 4-12 years, use Wong Baker "Faces" Scale
- Avoid coaching the patient; simply ask him/her to rate his/her pain on a scale from 0-10, where 0 is no pain at all, and 10 is the worst pain ever experienced by the patient

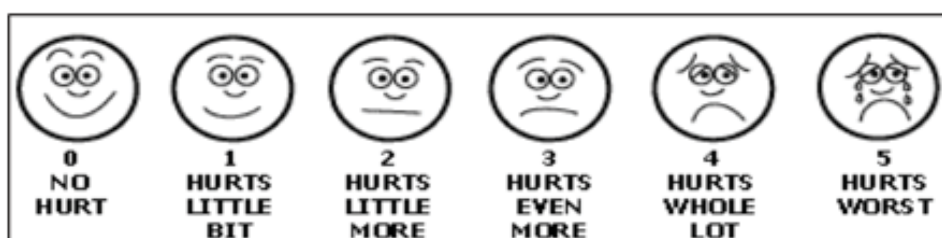


## The FLACC Behavioral Pain Assessment Scale

The FLACC Behavioral Pain Assessment Scale			
Categories	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs; frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to; distractable	Difficult to console or comfort

## **Wong-Baker "Faces" Scale**

The faces correspond to the numeric values from 0-5. The scale can be documented with the numeric value or the textual pain description





# Termination of Resuscitation For Traumatic Cardiac Arrest

**Exclusion Criteria:** (Patients for whom this protocol does not apply):

Hypothermic Patients, refer to Hypothermia protocol, **Yellow 7**

Drowning patients, refer to Drowning/Submersion Injuries protocol, **Yellow 11**

Patients whose presentation is consistent with a medical cause of cardiac arrest, refer to Cardiac Arrest protocol, **Red 8**

**Inclusion Criteria:** Cardiac arrest from blunt or penetrating trauma in **adult** and **pediatric** patients.

E A P

## EMT/ADVANCED EMT/ PARAMEDIC

1. Do not initiate cardiac arrest resuscitation if any of the following exist:
  - a. Injuries incompatible with life
  - b. Evidence of significant time lapse since pulselessness
    - i. Dependant lividity, rigor mortis, or decomposition
2. Do not initiate resuscitation in blunt trauma patients who are apneic and pulseless
3. Do not initiate resuscitation in penetrating trauma patients who are pulseless and apneic
4. CONSIDER resuscitation and transport **ONLY** if, transporting in a safe and prudent manner, you can deliver the patient to a hospital within 15 minutes of the TIME OF ARREST

## PARAMEDIC

4. If resuscitation initiated, consider the following:
  - a. Bilateral needle decompression of the chest to alleviate tension pneumothorax (Chest Trauma protocol, **Green 10**)
  - b. Fluid bolus

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# Crush Injury

E A P

## EMT/ADVANCED EMT/ PARAMEDIC

1. If severe hemorrhage is present, refer to Hemorrhage Protocol, **Green 12**
2. Administer high-flow oxygen to maintain O<sub>2</sub> sat between 94-99%
3. Manage airway as appropriate, see **Blue 3**

A P

## ADVANCED EMT/PARAMEDIC

4. Intravenous access should be established with Normal Saline initial bolus of 10-15 mL/kg (prior to extrication if possible)

## PARAMEDIC

5. For significant crush injuries or prolonged entrapped extremity, consider sodium bicarbonate 1 mEq/kg (max dose of 50 mEq) **IV** bolus over 5 minutes
6. Attach ECG monitor. Obtain/interpret 12-Lead ECG, if available. Carefully monitor for hyperkalemia or dysrhythmias before and immediately after release of pressure and during transport
7. For pain control, consider analgesics; refer to Universal Pain Management protocol, **Green 17**
8. Consider the following post extrication:
  - a. Continued resuscitation with Normal Saline
    - i. **Adult:** 500-1000 mL/hr
    - ii. **Pediatric:** 10 mL/kg/hr
  - b. If ECG suggestive of hyperkalemia, consider calcium gluconate solution (diluted in 50-100 mL):
    - i. **Adult:** 1 gram **IV** over 5 minutes
    - ii. **Pediatric:** 20 mg/kg (with MAX dose of 1 gram) **IV** over 5 minutes**NOTE:** DO NOT administer Calcium through same IV as Sodium Bicarbonate
  - c. If not already administered, for significant crush injuries with ECG suggestive of hyperkalemia, administer:
    - i. Sodium bicarbonate 1 mEq/kg **IV** over 5 minutes with MAX dose of 50 mEq
  - d. If ECG suggestive of hyperkalemia, consider albuterol 5 mg via small volume nebulizer.



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## PEARLS for Crush Injury:

Signs of hyperkalemia include the following:

1. Peaked T waves
2. Widened QRS
3. Lengthened QT interval
4. Loss of P waves

# Facial/Dental Injury

## EMT/ADVANCED EMT/ PARAMEDIC

1. Administer oxygen, as appropriate, with a target of achieving 94-98% saturation
2. **Avulsed tooth:**
  - a. Avoid touching the root of the avulsed tooth. Do not wipe off tooth
  - b. Pick up at crown end. If dirty, rinse off under cold water for 10 seconds
  - c. Place tooth in milk or saline as the storage medium. Alternatively, a cooperative patient can hold tooth in mouth using own saliva as storage medium
3. **Unstable Mandible Injury:**
  - a. Expect patient cannot spit/swallow effectively and have suction readily available.
  - b. Preferentially transport sitting up with emesis basin/suction available (in the absence of a suspected spinal injury, see Spinal Management Protocol, **Green 7**)
4. **Epistaxis:**
  - a. Squeeze nose (or have patient do so) for 10 – 15 minutes, continuously.
5. **Nose/Ear Avulsion:**
  - a. Recover tissue if it does not waste scene time
  - b. Transport with tissue wrapped in dry sterile gauze in a plastic bag placed on ice
  - c. Severe ear and nose lacerations can be addressed with a protective, moist sterile dressing

## ADVANCED EMT/PARAMEDIC

6. IV access, as needed, for fluid or medication administration

## PARAMEDIC

7. Pain medication as per Universal Pain Management protocol, **Green 17**

# Ophthalmology

## EMT/ADVANCED EMT

1. Flush eye with sterile saline or clean water source continuously (*for chemical exposure*)
2. Assist patient with removal of contact lenses
3. Assess gross visual acuity
4. For thermal exposure, apply cool saline gauze compress to both eyes
5. For impaled object, secure object and patch both eyes and keep patient supine
6. For puncture wound, place protective shields over both eyes and keep patient supine.
7. **For eye trauma:**
  - a. Place eye shield for any significant eye trauma
  - b. If globe is avulsed, do not put back into socket: cover with moist saline dressings and then place cup over it

## AEMT

8. For **penetrating** or blunt eye trauma, if patient experiences nausea,
  - a. Consider ondansetron 4 mg ODT **PO** ; repeat in 15 minutes x 1, if needed

## PARAMEDIC

9. For **penetrating** or blunt eye trauma, if patient experiences nausea,
  - a. Consider ondansetron 4 mg ODT **PO** or ondansetron 4 mg **IV**; repeat in 15 minutes x 1, if needed
10. If **no** penetrating eye trauma and if the patient has no allergy to local anesthetics: Administer 2 drops tetracaine ophthalmologic drops every 5 minutes as needed to affected eye to facilitate eye flushing. This may be repeated for a total of 3 doses.

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For further dosing, please contact OLMC medical control

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10. To facilitate flushing, the Paramedic may use a Morgan lens, if trained to do so

## Pearls for eye injuries

- Normal or near normal vision does not r/o significant eye injury
- Chemical and thermal burns to the face may have concomitant respiratory injury
- Vomiting increases intraocular pressure and should be avoided in patients with eye injury.
- Tetracaine is to be provided by the Paramedic provider only and not provided to the patient for ongoing use

# Poisoning/Overdose #1

**Call Poison Control (1-800-222-1222) to receive medical guidance on patient care and to ensure that information regarding the toxin can be sent to the receiving ED prior to patient arrival.**

## EMT

1. Administer O<sub>2</sub>, as appropriate
2. Manage airway as needed, see **Blue 3**
3. Request ALS
4. If respirations less than 12/minute AND **narcotic overdose** suspected  
\*\*\*NEVER GIVE NALOXONE TO A NEONATE\*\*\*
  - a. **ADULT** and **PEDIATRIC** patients: naloxone 0.5 mg **IN**. Titrate to effect by providing 0.5 mg in one nostril:
    - i. The desired outcome is effective oxygenation and ventilation with one important parameter being a respiratory rate of greater than 12 breaths/minute. Continue to manage the airway while assessing for effect.
    - ii. If the patient remains apneic or continues to have ineffective oxygenation and ventilation 2-5 minutes after provision of the first dose of naloxone, provide a second dose of naloxone 0.5 mg in the other nostril.
    - iii. Repeat 0.5 mg of naloxone **IN** every 2-5 minutes in alternating nostrils.
  - b. **EMRs** and **EMTs** may use **IN** or **IM** naloxone via auto-injector at a dose available per commercially packaged product. Repeat dose (in opposite nostril if using **IN** route) if no response in 2-5 minutes. Lower dose strategies that allow titration of effect are preferred, whenever possible.
  - c. **NOTE:** Patients abruptly and fully awakened from narcotic overdose may become combative or suffer acute narcotic withdrawal symptoms. Some drugs such as prolonged release opioids, buprenorphine or methadone may require doses greater than 4 mg.
5. For suspected cyanide or CO poisoning, see Cyanide/CO Exposure protocol **Yellow 4**
6. For hypoglycemia, see Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**
7. For seizures, see Seizure protocol, **Gold 8**

## ADVANCED EMT/PARAMEDIC

8. Establish IV access
9. Alternative naloxone route of administration
  - a. Naloxone 0.1 - 2 mg **IV/IO/IM**; titrate to improved respiratory drive
  - b. **Pediatric** patients: 0.1 mg/kg naloxone if less than 20 kg; 0.1-2 mg **IV/IO/IM** if greater than 20 kg or 5 years or older; titrate to to improved respiratory drive
10. Cardiac Monitor
11. If patient is hypotensive, administer a fluid bolus
12. Obtain ECG, if so trained

## PARAMEDIC

13. Ingested Poison: the role of charcoal in EMS is of limited value and should be provided **ONLY** under OLMC guidance. Contact OLMC to consider:
  - a. Activated charcoal with**OUT** sorbitol 1 gram/kg **PO**
  - b. Do **NOT** provide charcoal under the following circumstances:
    - i. Ingested caustic substance
    - ii. Hydrocarbons
    - iii. Seizures
    - iv. Patient is unable to swallow/protect airway



## Poisoning/Overdose #2

### PARAMEDIC (cont.)

14. For absorbed toxins resulting in pain, see Universal Pain Management protocol, **Green 17** or analgesic for eye pain, see Ophthalmology protocol, **Green 23**
15. Suggested Treatments
- Symptomatic beta- or calcium channel blocker overdose, see Bradycardia protocol, **Red 18**
  - Dystonic reaction:
    - Adult:** Diphenhydramine 25-50 mg **IV/IM**
    - Pediatric:** Diphenhydramine 1-2 mg/kg **IV/IM** (MAX dose 50 mg)
  - Organophosphates, see Nerve Agent/Organophosphate/Carbamate Poisoning protocol, **Yellow 3**
  - Severe agitation, see Agitation/Excited Delirium protocol, **Orange 3**
  - Tricyclic Antidepressant with either hemodynamic instability or widened QRS Complex ( $> 120$  msec)
    - Administer sodium bicarbonate 1 mEq/kg IV. May repeat as needed with goal of QRS complex less than 120 msec
    - Contact OLMC if further direction needed for conditions such as arrhythmia



### PEARLS

- If possible, bring container/bottles, MSDS sheets, placard info, shipping manifest, and/or contents and note the following:
  - Route, time, quantity and substance(s)
  - Reason, if known: intentional or accidental
  - What treatments were provided prior to your arrival
- Pulse oximetry may NOT be accurate for toxic inhalation patients

### For management of opioid overdose:

- Recall, the patient suffering from opiate overdose requires immediate oxygenation and ventilation. This should be the priority for these patients and is accomplished by airway management. Naloxone may be administered, but only after initiation of airway management practices.
- Naloxone should be titrated to adequate respiratory drive and airway protection rather than a completely awakened state.
- Patients receiving naloxone should be transported to the hospital. Contact OLMC for patients refusing transport.

### For tricyclic antidepressant toxicity:

- Sodium bicarbonate increases extracellular sodium, thereby overcoming sodium channel blockade of the tricyclic antidepressant. This effect is transient and may be difficult to notice at first. Some patients may need repeated doses of sodium bicarbonate to fully correct QRS duration (under 120 msec). If no change to the QRS occurs, please repeat immediately. While some patients may require additional doses of sodium bicarbonate, this should not delay transport.
- Consider the importance of alerting OLMC.



# Nerve Agent/Organophosphate/Carbamate Poisoning

## PEARLS :

**WARNING: CONTACT WITH THESE TOXINS CAN BE FATAL TO RESCUERS.**

**CONSIDER SCENE SAFETY AND DECONTAMINATION**

- Assess for **SLUDGEM** symptoms (**S**alivation, **L**acrimation, **U**rination, **D**efecation, **G**I Distress, **E**mesis, **M**uscle twitching/**M**iosis [constricted pupils]) and the **Killer-B's** (**B**radycardia, **B**ronchorrhea, **B**ronchospasm)
- If you suspect a bioterrorism/WMD threat, see **Grey 21**
- Transport patients with all windows of ambulance open
- Decontaminate entire ambulance after patient transport
- All responders who contacted the patient require decontamination

In unstable patients with known organophosphate/carbamate poisoning:

### EMT

1. Remove patient from contaminated area and consider decontamination as needed based on scene/call circumstances
2. O<sub>2</sub> as appropriate
3. Manage airway as appropriate, see **Blue 3**  
\*Ventilatory support may be critical in these poisonings\*
4. Vigorous suctioning may be necessary
5. Request ALS
6. Mark 1 kit (noted as **auto-injector** in table below)

### ADVANCED EMT

7. IV en route
8. Cardiac monitor
9. In all cases, continue to monitor closely for worsening symptoms

### PARAMEDIC

10. If seizures are present, refer to Seizure protocol, **Gold 8**

11. Contact OLMC for:

- a. Doses of medications beyond those listed in the chart below
- b. Administration of other selected antidotes



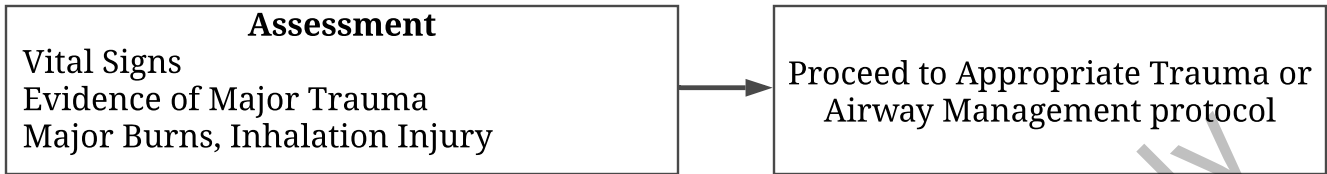
Symptoms	Dyspnea, twitching, nausea, vomiting, sweating, confusion, or pinpoint pupils	Apnea, seizure, unconsciousness, or flaccid paralysis
Pediatric < 1 year old	1 <b>pediatric</b> atropine auto-injector <b>IM</b> or 0.2 mg <b>IV/IO*</b> , <b>AND</b> Midazolam 0.2 mg/kg <b>IM</b> (MAX dose 10 mg) or 0.1 mg/kg <b>IV/IO</b> (MAX dose 5 mg) **	
Pediatric 1 year or older	1 <b>adult</b> atropine auto-injector <b>IM</b> or 2 mg <b>IV/IO*</b> , <b>AND</b> Midazolam 0.2 mg/kg <b>IM</b> (MAX dose 10 mg) or 0.1 mg/kg <b>IV/IO</b> (MAX dose 5 mg) **	
Adult	1 atropine auto-injector <b>IM</b> or 2 mg <b>IV/IO*</b> <b>AND</b> Midazolam 10 mg <b>IM</b> or 5 mg <b>IV/IO</b> **	3 atropine auto-injectors <b>IM</b> or 5 mg <b>IV/IO*</b> <b>AND</b> Midazolam 10 mg <b>IM</b> or 5 mg <b>IV/IO</b> **

\* Monitor and repeat dose every 5 minutes if patient remains symptomatic

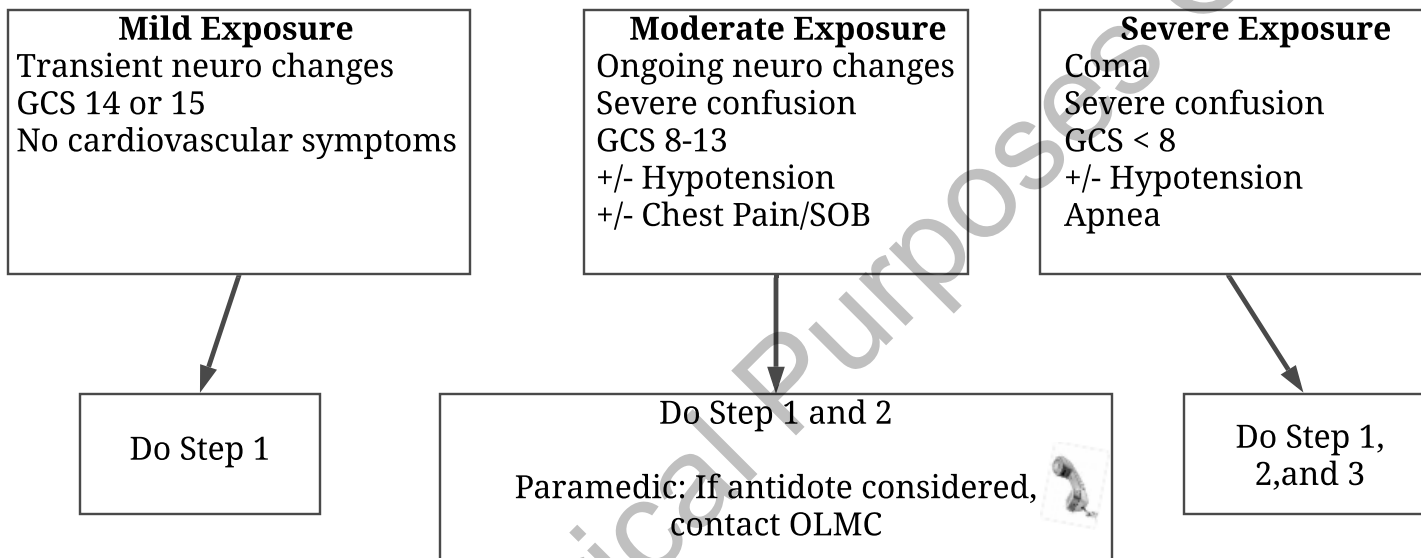
\*\* Repeat Midazolam every 5 minutes until total of 3 doses have been provided

# Cyanide/CO Exposure #1

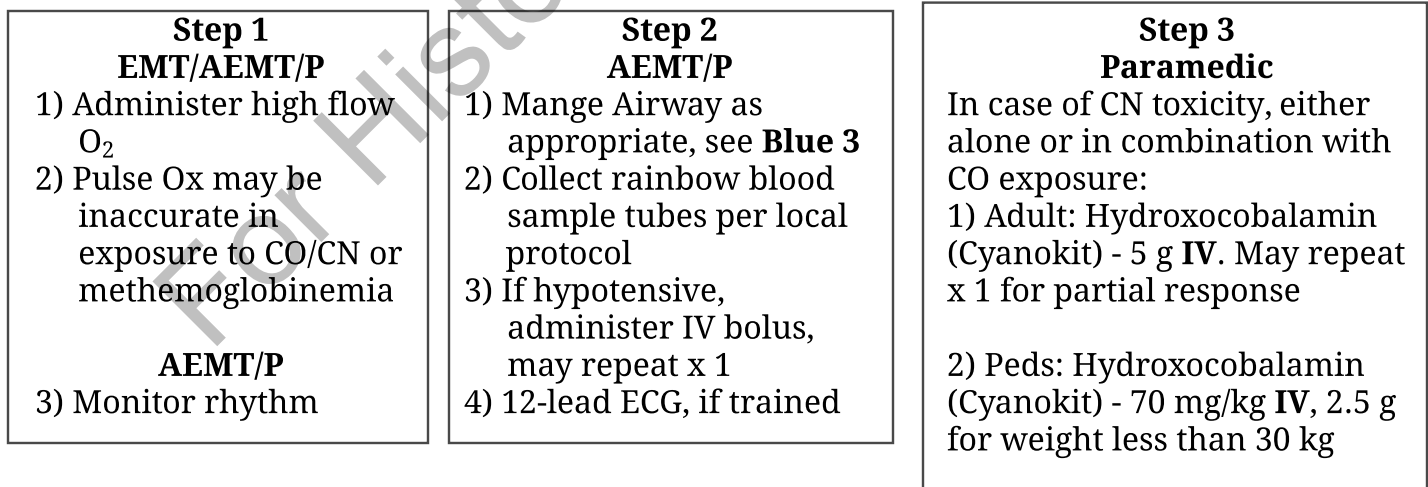
Don PPE if necessary, assess patient after evacuation  
 \*\*\*Remove patient from source of smoke/inhalation\*\*\*



## Severity of Exposure Definitions (CO, CN, or Combined)



## Treatments



## Known or Suspected Cyanide/CO Exposure #2

### PEARLS for CO/Cyanide Exposure:

- Finger CO monitors may not accurately detect CO level and should not be relied upon to guide treatment or alter transport decision.
- There is no correlation between CO (Carboxyhemoglobin) level and ETCO<sub>2</sub> (waveform capnography).
- Carbon monoxide (CO) and Hydrogen cyanide (HCN) gases are chemical asphyxiants that can kill rapidly. Carbon monoxide is odorless. Only 40% are able to detect the almond smell of CN. Cyanide is generated by combustion of synthetic materials present in many structural fires.
- Appropriate PPE includes self-provided air/oxygen source (i.e. SCBA). Scene safety is the top priority. No patient decontamination is required for victims evacuated from CN gas exposure.
- It is rare for viable CO-exposed patients to have persistent unconsciousness requiring intubation.
- Sources of CN: Structural fire (HCN), industrial cyanide salts\*, unripe cassava, apricot pits, laetrile, etc.
- If injuries incompatible with life, DO NOT GIVE ANTIDOTE.

\*may persist on skin, however water decontamination may liberate HCN gas.

# Radiation Injuries

## EMT/AEMT

1. Ensure the scene is safe.
2. Don standard PPE capable of preventing skin exposure to liquids and solids (gown and gloves), mucous membrane exposure to liquids and particles (face mask and eye protection), and inhalational exposure to particles (N95 face mask or respirator).
3. Hazmat Trained Personnel to determine need for decontamination
4. For **Mass Casualty Incidents (MCI)**, if vomiting occurs:
  - a. Within 1 hour of exposure, survival is unlikely. If providing care to patient will compromise other patients, tag patient **"Black"**.
  - b. Less than 4 hours after exposure, patient requires immediate decontamination and medical evaluation, tag patient **"Red"**.
  - c. 4 hours after exposure, re-evaluation can be delayed 24-72 hours, tag patient **"Yellow"**.
5. Treat traumatic injuries per appropriate protocol (**Green Section**).
6. Use water-repellent dressings to cover wounds to prevent cross contamination.
7. Consider transport only after appropriate decontamination

## PARAMEDIC

8. Consider anti-emetic per Nausea and Vomiting protocol, **Gold 19**. Document the time the GI symptoms started.
9. Consider pain management per Universal Pain Management protocol, **Green 17**.
10. Treat seizures per Seizure protocol, **Gold 8**. \*Consider a primary medical cause or exposure to possible chemical agents unless indicators for a large whole body radiation dose (> 20 Gy), such as rapid onset of vomiting, are present.

## Pearls

- In general, patients exposed or contaminated by radiation should be triaged and treated according to the severity of their conventional injuries.
- Patients contaminated with radioactive material (flecks embedded in clothing or skin), generally pose minimal exposure risk to medical personnel who use appropriate PPE.
- Irradiated patients pose no threat to medical providers.
- Time to nausea and vomiting is a reliable indicator of receiving a significant dose of ionizing radiation. The more rapid the onset of vomiting, the higher the whole-body dose of radiation.
- Tissue burns are a late finding (weeks following exposure) of ionizing radiation injury. If burns are present acutely, they are from a thermal or chemical mechanism.
- Seizures may suggest acute radiation syndrome if accompanied by early vomiting. If other clinical indicators do not suggest a whole-body dose of greater than 20 Gy, consider other causes of seizure.

# Hypothermia #1

Classification	Core Temp	Clinical Presentation
Normal	>95° F / 35° C	<b>Cold sensation/shivering</b>
Mild	90 - 95° F 32 - 35° C	Loss of fine or gross motor skills inability to complete simple thoughts
Moderate	82 - 90° F 28 - 32° C	<b>&lt;= 90° F/32° C: Shivering stops</b> <b>&lt;=86° F/30° C: AMS</b>
Severe	<= 82° F <= 28° C  <= 77° F <= 24° C	Rigidity, vital signs reduced/absent. Severe risk of V-fib with mechanical simulation (rough handling)  Spontaneous V-fib cardiac arrest

**Bold** indicates major thresholds between stages

Adapted from "State of Alaska Cold Injuries Guidelines" 2014

## Treatment

SEVERE HYPOTHERMIA **WITH** SIGNS OF LIFE/**NOT** IN CARDIAC ARREST:

### EMT

1. Prevent further heat loss by insulating from the ground and shielding from wind and water. Move to a warm environment, when possible. **Gently** remove wet clothing. Cover with warm blankets
2. Pack thorax with wrapped heat pack
3. Consider warmed AND humidified 100% O<sub>2</sub>
4. High sugar oral fluids, if tolerated, and only in mild hypothermia
5. Handle gently; avoid rough movement and excess activity
6. Maintain supine position in moderate or severe hypothermia

### ADVANCED EMT/ PARAMEDIC

7. Consider one to two 500 mL (20 mL/kg for **pediatrics**) boluses of NS heated to 104 - 108° F (40 - 42° C)



- 
8. Contact OLMC for additional boluses
- 



# Hypothermia #2

## SEVERE HYPOTHERMIA **WITHOUT** SIGNS OF LIFE

**Note:** Assess for pulse and respirations for 1 minute

**Note:** Definitive treatment for severe hypothermia without signs of life is rewarming with cardiopulmonary bypass. Do not delay transport of these patients. Do not initiate CPR if it will delay transport.

*Do not initiate resuscitation if the patient meets any of the criteria in **Grey 1** Section II.A OR Rescuers are exhausted or in a dangerous situation. These patients are deceased.*

### EMT

1. Initiate CPR after 1 minute pulse/respiration assessment
2. Attach AED and follow prompts.
3. Rewarm using techniques as listed under Treatment: Not in Cardiac Arrest (above)

- 
4. If no ROSC after 20 minutes of CPR/rewarming, consider termination of resuscitation. Contact OLMC, if possible
- 



### ADVANCED EMT/PARAMEDIC

5. Consider one to two 500 mL (20 mL/ kg for pediatrics) boluses of NS heated to 104 - 108° F (40 - 42° C)
- 

6. Contact OLMC for additional boluses
- 



7. Otherwise, treat as per normothermic cardiac arrest management for the patient's dysrhythmia, refer to Cardiac Arrest protocol, **Red 8**

### PEARL

- Do not massage extremities in attempt to actively re-warm the patient

A P



# Hyperthermia - Heat Exhaustion

**HEAT EXHAUSTION** — Volume depletion due to sweat loss

## **ASSESSMENT:**

If core temperature is obtained, it will be variable but always below 105° F (40.6° C).

Clinical pattern is essentially that of compensated hypovolemic shock:

- Weakness and vomiting
- Skin is variable. Core-shell shunt to increase heat loss competes with shell-core shunt to protect volume. Skin is usually pale and moist with variable skin temperature
- Sweating
- Normal consciousness and CNS function

**TREATMENT:** Goal is to reduce sweating and to restore volume

## **EMT**

1. Protect the patient from heat challenge. Stop exercise and put patient at rest in a cool, shady place
2. Use evaporation techniques and remove/loosen as much clothing as practical
3. Oral fluids can be effective if the patient is not vomiting. Use dilute (less than 5% sugar) fluids given in small sips. Appropriate fluids to use include the World Health Organization's Oral Rehydration Solution OR a "homemade" solution using 1 teaspoon of salt and 8 teaspoons of sugar per 1 liter of water

## **ADVANCED EMT / PARAMEDIC**

4. Establish IV
5. Perform fluid bolus

# Hyperthermia - Heat Stroke

**HEAT STROKE** — A true medical emergency that requires radical field treatment, usually, but not always, associated with heat exhaustion. Heat stroke is characterized by multisystem organ injury and failure. CNS dysfunction characterized by alterations in mental status is a hallmark distinguishing between heat exhaustion and heat stroke.

## **ASSESSMENT:**

If core temperature is obtained, it is 105° F (40.6° C) or greater. Abnormal consciousness and/or CNS function; seizures are common. Any acute change in consciousness/CNS function in the context of a significant heat challenge should be managed as heat stroke without delay. Skin and sweating are variable, depending on volume status. Note that red, dry skin is not a dependable sign of heat stroke.

## **TREATMENT:**

Immediate radical cooling is the urgent priority, followed by volume replacement.

## **EMT**

1. Cool the patient immediately by any means practical, such as:
  - a. Initiate Radical Cooling when available (especially beneficial for exertional hyperthermia, i.e. athletes, laborers):
    - i. Immerse patient up to their neck in ice water tub (if available).
    - ii. TACO Method (Tarp-Assisted Cooling with Oscillation) (if available) with 4-5 people holding the patient in a tarp, add ice water at foot and up to the neck and continuously oscillate the tarp to avoid warming of water in contact with the patient.
  - b. Also consider non-radical cooling which includes: ice packs applied to neck, axillae, groin, back; wet patient, apply cold wet sheets to patient, and air conditioning en route
  - c. Consider moistening the skin and fan vigorously. This method is effective only at low ambient humidity and a large electric fan is more beneficial than manual fanning.
2. Discontinue radical cooling if:
  - a. Shivering begins
  - b. Core temperature falls to 102° F (38.8° C).

## **ADVANCED EMT / PARAMEDIC**

3. Establish IV
4. Cardiac Monitor
5. Perform fluid bolus

### **Pearl**

If at a sporting or athletic event, it is important to discuss the cooling plan with other on-scene providers, i.e. sports medicine providers or athletic trainers prior to the start of the event to ensure that necessary equipment is available.

# Drowning/Submersion Injuries

## EMT

1. If C-spine injury suspected, manage C-spine per Spine Management protocol, **Green 7**
2. Obtain specific history including time, temperature, associated injury, etc.
3. Begin resuscitation efforts while removing patient from the water (e.g. rescue breaths) - follow ABC (rather than CAB) flow of resuscitation.
4. Consider hypothermia, refer to Hypothermia protocol, **Yellow 7**
5. Remove wet clothes and warm the patient
6. Conscious patients with submersion injuries should be transported to the hospital for further evaluation
7. If water temperature is estimated to be less than 43° F and submerged
  - a. Less than 90 minutes - initiate full resuscitation
  - b. Greater than 90 minutes - consider not initiating resuscitation or termination of resuscitation
8. If water temperature is estimated to be greater than 43° F and submerged
  - a. Less than 30 minutes - initiate full resuscitation
  - b. Greater than 30 minutes - consider not initiating resuscitation or termination of resuscitation

## ADVANCED EMT/PARAMEDIC

9. Consider CPAP to supplement the patient's own respiratory effort
10. Reassure anxious patients
11. If near-drowning incident involves scuba diver, suggesting barotrauma, contact OLMC and consider hyperbaric treatment facility

### PEARLS for Drowning:

- Fresh and salt water drowning are treated the same in the field; treatment must be directed toward correcting severe hypoxia.
- Factors affecting survival include the patient's age, length of time submerged, general health of the victim, type and cleanliness of liquid medium and water temperature that may contribute to the effectiveness of the mammalian diving reflex (decreased respirations, decreased heart rate, and vasoconstriction, with maintenance of blood flow to the brain, heart and kidneys).
- All drowning/near-drowning victims with suspected barotrauma/decompression sickness should be transported in the left lateral Trendelenburg position to prevent any emboli in the ventricles from migrating to the arterial system.
- Even patients that are conscious and appear well after a submersion event require hospital-level evaluation and observation as they may develop delayed symptoms.

Reference - Michael J. Tipton, Frank St. C. Golden, November 2010. "A proposed decision- making guide for the search, rescue and resuscitation of submersion (head under) victims based on expert opinion". *Resuscitation*. (2011) 82; 819– 824.

# Brief Resolved Unexplained Event (formerly known as ALTE)

## PEARLS

Definition of Brief Resolved Unexplained Event (BRUE):

These are sudden, brief (less than 1 minute), now resolved (returned to baseline) episodes of at least one of the following in a child less than 2 years old:

1. Cyanosis or pallor
2. Absent, decreased, or irregular breathing
3. Marked change in tone (hyper- or hypotonia)
4. Altered level of responsiveness

**NOTE:** Most children who experience a BRUE have a normal physical exam, however, almost 50% will have an underlying condition requiring comprehensive medical care.

In many cases, details from the child's home may be important to downstream, health care providers. Please include details, such as the following, when providing report to the hospital:

1. Make note of the home environment: Medications, condition, caregiver's condition, possibility of toxic exposure, etc.
2. Are there any concerns for non-accidental trauma?

## EMT/ADVANCED EMT /PARAMEDIC:

1. Obtain medical history
    - a. Determine the severity, nature, and duration of the episode
    - b. Was the patient awake or sleeping at the time of the episode?
    - c. Include details of the resuscitation, if applicable
  2. Keep the child warm and transport to the emergency department
- 
3. Contact OLMC for assistance if the parent/guardian refuses medical care and/or transport
- 



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# Pediatric Respiratory Distress with Inspiratory Stridor

Inspiratory stridor may be due to many causes in the pediatric population, including croup, foreign body aspiration, or epiglottitis.

Stridor refers to upper airway obstruction as in laryngotracheitis/croup and is often accompanied by hoarseness and/or a barking cough (seal-like cough).

As stridor worsens in severity, the following may also be observed: tachypnea, retractions, accessory muscle use, nasal flaring, fatigue from respiratory effort, and cyanosis.

## EMT / ADVANCED EMT

1. Humidified O<sub>2</sub>, if available and as appropriate, with upright posture
2. If needed, assist ventilations with PPV using 100% O<sub>2</sub>
3. Request ALS, if available

## PARAMEDIC

4. Contact OLMC for the following OPTION:
  - a. Inhalation of **nebulized** solution of 1 mL 1mg/mL EPINEPHrine OR 0.5 mg racemic epinephrine mixed with 2 mL normal saline solution\*
  - b. Dexamethasone 0.6 mg/kg **PO/IV/IM/IO** x 1 (MAX dose 10 mg)

\* Nebulized EPINEPHrine/racemic EPINEPHrine may be contraindicated in children with a history of congenital heart disease

## PEARLS

A common challenge when working with the pediatric population is the administration of medication. If commercial products are unavailable, alternative measures are often undertaken, such as crushing and dissolving portions of a tablet, or extemporaneous compounding of oral products. In some cases, an extemporaneous liquid cannot be prepared easily from tablets or capsules and off-label oral use of an intravenous (IV) or intramuscular (IM) preparation is considered. An example of this is administering the *injectable* formulation of dexamethasone *orally* for the treatment of pediatric croup. This practice is followed in emergency departments around the country.

**Please note that at this time, the only IV medication on the MEMS formulary that has been approved to be given orally is single-dose/one-time use dexamethasone, for this protocol only.**

# Neonatal and Young Infant Fever

## PEARLS

Neonates and young infants have immature immune systems and are at high risk for serious bacterial infection despite appearing well. The rate of serious bacterial infection (SBI) is up to 20% in neonates. Often, fever may be the only sign of critical illness in these children. All febrile neonates and young infants should be transported to the emergency department for further evaluation.

### Definitions:

- Neonates are children 0-28 days old
- Young infants are less than 90 days old.
- Fever is a temperature of greater than or equal to 38.0 °C or 100.4 °F measured by any method by either caregivers or EMS.
- Serious Bacterial Infections (SBI) in neonates and young infants may also present with hypothermia (temperature less than 35.0°C or 95.0 °F)

### EMT/ADVANCED EMT/PARAMEDIC:

1. Obtain medical history
    - a. What was the highest temperature? How was it recorded?
    - b. Is the child still feeding normally? If not, are there signs of dehydration?
    - c. Birth history: was the baby full-term or premature? Was the baby admitted to the NICU?
    - d. Were there complications from the pregnancy/delivery?
  2. Evaluate the neonate or young infant for the following:
    - a. Appearance (tone, interactivity, consolability, gaze, cry),
    - b. Work of breathing (abnormal noises or position, retractions, flaring), and, Circulation (pallor, mottling, cyanosis) as well as,
    - c. Evidence of dehydration.
  3. Evaluate for shock due to severe sepsis. If present, treat per Medical Shock protocol, **Gold 14** and notify receiving hospital.
  4. Transport to the emergency department for further evaluation.
- 
5. Contact OLMC for assistance if the caregiver/guardian refuses medical care and/or transport
- 



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# Childbirth

## EMT/ADVANCED EMT/PARAMEDIC

1. Evaluate for crowning/imminent delivery
2. If crowning/imminent delivery, encourage mother to relax, breathe slowly, and let baby deliver
3. If hypotensive, roll patient onto left hip
4. If the presenting part is the cord, apply pressure to the baby with a sterile, gloved hand to keep pressure off the cord until cord pulsations are felt. Raise mother's hips onto pillows. Keep cord warm and moist. Do not clamp or cut cord
5. Request ALS, if available, and DO NOT DELAY TRANSPORT
6. If baby's head is delivering:
  - a. Do not hurry or slow the birth
  - b. Check to see if cord is wrapped around neck. If so, attempt to slip the cord over the baby's head, then repeat in case of double nuchal cord. Do not clamp and cut the cord unless it appears to obstruct the birth
  - c. Place baby immediately skin-to-skin with the mother. Dry baby, examine and keep warm, next to mother's skin. As soon as possible, enable child to nurse at mother's breast
  - d. Assess APGAR SCORE at 1 and 5 minutes, refer to APGAR Score, **Pink 5**
  - e. Do not externally massage the uterus en route until placenta has delivered
  - f. Do not forcibly remove placenta
  - g. The cord may be left intact, or it may be double clamped and cut only when:
    1. the baby is breathing and all cord pulsations have stopped (usually within 3 to 5 minutes), or
    2. the baby must be moved to allow for advanced newborn resuscitation, or
    3. Once the placenta has delivered.
  - h. If placenta is delivered, wrap and package with cord intact
7. If delivery has occurred, immediately dry/stimulate the child, then maintain the child on the mother's chest/abdomen to maintain warmth. During transport, the child should be placed in an appropriate child passenger restraint system with the head supported. Maintain warmth during transport. Consider wrapping the child and placing a hat to minimize heat loss. **Monitor the baby's airway during transport.**

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# APGAR Score

Assess the baby at 1 minute and again at 5 minutes

DO NOT DELAY RESUSCITATION to obtain APGAR Score

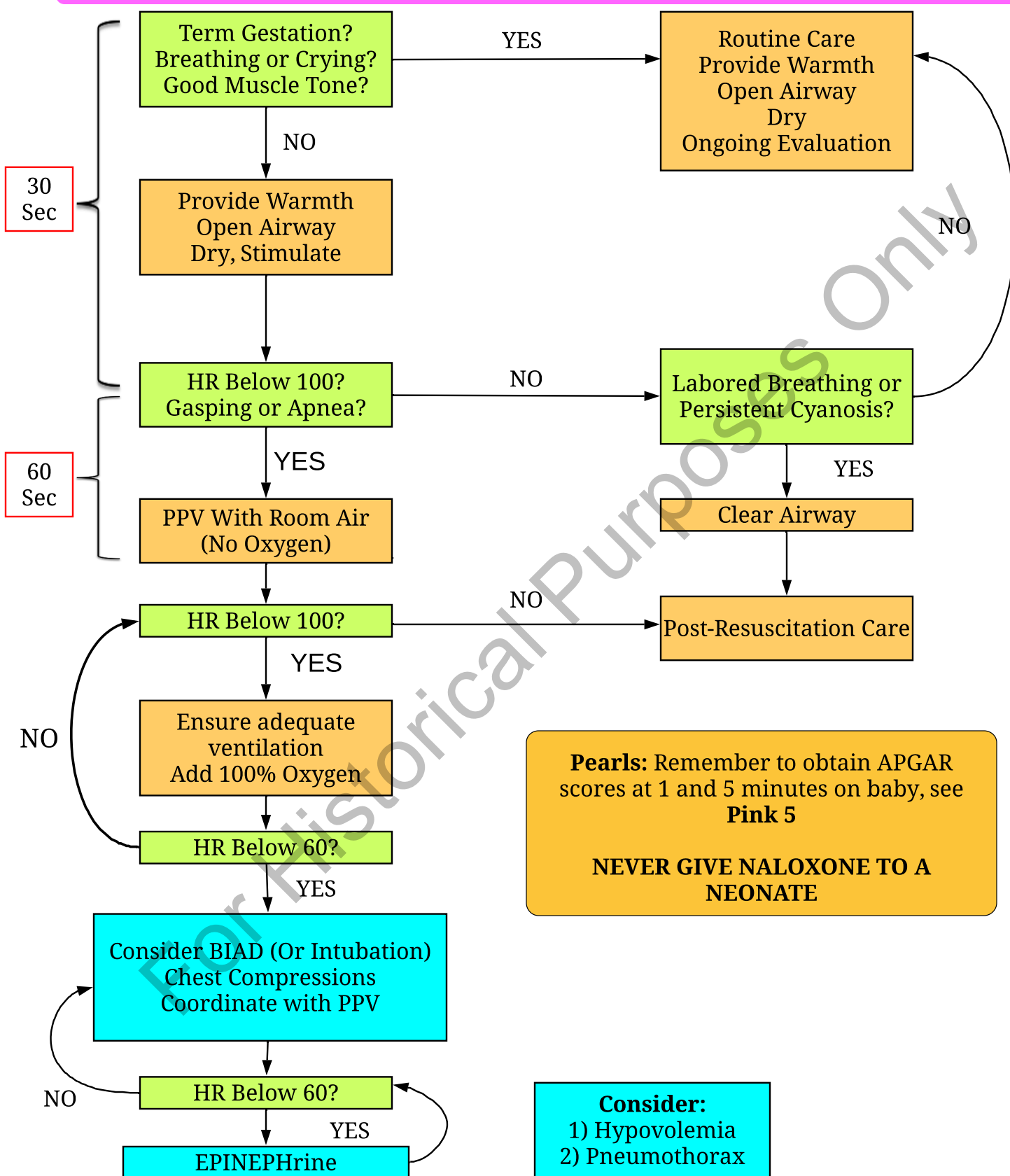
A score of less than 7 suggests need for resuscitation with suction, ventilation, and ALS back up

APGAR Score				
		0	1	2
A	Appearance	Blue or Pale	Body Pink/ Hands Blue	Pink
P	Pulse	Absent	less than 100	greater than 100
G	Grimace*	None	Grimace	Cough
A	Activity**	Flaccid	Some	Good
R	Respiration	Absent	Weak	Good

\* Tested by a suction catheter or bulb syringe tip gently placed in the nose or mouth

\*\* Amount of spontaneous flexion of extremities

# Neonatal Resuscitation



## Normal Pediatric Vital Signs

Normal Pediatric Vital Signs				
	Systolic	Pulse Awake	Pulse Sleeping	Respirations
Newborn - 3 months	> 60 mmHg	85-205	80-160	30-60
3 months - 2 years	> 70 mmHg	100-190	75-160	24-40
2-10 years	See Below *	60-140	60-90	18-30
> 10 years	> 90 mmHg	60-100	50-90	12-16

Note: Estimated weight in kilograms:  $[2 \times (\text{age in years})] + 8$

\* Typical Systolic BP in children 1-10 years of age:  $90 + (\text{age in years} \times 2)$

\* Lower Limits of Systolic BP for a child age 1-10 years:  $70 + (\text{age in years} \times 2)$

Modified GCS for Infants and Children			
	Child	Infant	Score
EYE OPENING	Spontaneous	Spontaneous	4
	To speech	To speech	3
	To pain only	To pain only	2
	No response	No response	1
BEST VERBAL RESPONSE	Oriented/Appropriate	Coos and babbles	5
	Confused	Irritable, cries	4
	Inappropriate words	Cries to pain	3
	Incomprehensible sounds	Moans to pain	2
	No response	No response	1
BEST MOTOR RESPONSE	Obeys commands	Moves spontaneously/ purposefully	6
	Localizes painful stimuli	Withdraws to touch	5
	Withdraws in response to pain	Withdraws in response to pain	4
	Flexion in response to pain	Abnormal flexion in response to pain	3
	Extension in response to pain	Abnormal extension in response to pain	2
	No response	No response	1

## Pediatric Specific Equipment Sizes

Equipment	GREY 3-5 kg	PINK Small Infant 6-7 kg	RED Infant 8-9 kg	PURPLE Toddler 10-11 kg	YELLOW Small Child 12-14 kg	WHITE Child 15-18 kg	BLUE Child 19-23 kg	ORANGE Large Child 24-29 kg	GREEN Adult 30-36 kg
BVM	Infant or child	Infant or child	Infant or child	Child	Child	Child	Child	Child	Adult
Oral Airway (mm)	50	50	50	60	60	60	70	80	80
Laryngo- scope Blade (size)	1 straight	1 straight	1 straight	1 straight	2 straight	2 straight	2 straight or curved	2 straight or curved	3 straight or curved
ET Tube	3.0 cuffed	3.0 cuffed	3.0 cuffed	3.5 cuffed	4.0 cuffed	4.5 cuffed	5.0 cuffed	6.0 cuffed	6.5 cuffed
ET Tube Insertion length (cm)	3 kg 9-9.5 4 kg 9.5-10 5 kg 10-10.5	10.5-11	10.5-11	11-12	13.5	14-15	16.5	17-18	18.5-19.5
Stylet	Pedi	Pedi	Pedi	Pedi	Pedi	Pedi	Adult	Adult	Adult
Suction Catheter (F)	8	8	8	10	10	10	10	10	10-12
BP Cuff	Neonate	Infant or child	Infant or child	Child	Child	Child	Child	Child	Small adult
IO (Ga)	18/15	18/15	18/15	15	15	15	15	15	15
NG Tube (F)	5-8	5-8	5-8	8-10	10	10	12-14	14-18	16-18
LMA	1	1.5	1.5	2	2	2	2.5	2.5	3
KING	0	1	1	1	2	2	2	2.5	2.5

For ET size, pinky finger diameter in a child affords an acceptable approximate of ET tube outer diameter. The formula for tube size is as follows: "Age (in years)/4 + 3.5 (cuffed)" and the length-based tape may be used for internal diameter determination. Using a tube one size larger or smaller than this guideline is also acceptable.

# Pediatric Transportation

## PEARLS

These guidelines apply to transporting pediatric patients who are of an age/weight that require a child safety seat. Pediatric patients that don't require a child safety seat should be transported following adult guidelines.

Maine Statute 29-A M.R.S. §2081(2) & (3) requires all children weighing less than 80 pounds, less than 57 inches in height and less than 8 years old to be properly restrained in a child safety seat when riding in a vehicle. Children between 40 and 80 pounds AND less than 8 years of age must be properly secured in a child restraint system in accordance with the child restraint system manufacturer's recommendations. An ill or injured child must be restrained in a manner that minimizes injury in an ambulance crash. The best location for transporting a pediatric patient is secured directly to the ambulance cot. Never allow anyone to hold an infant or child during transport.

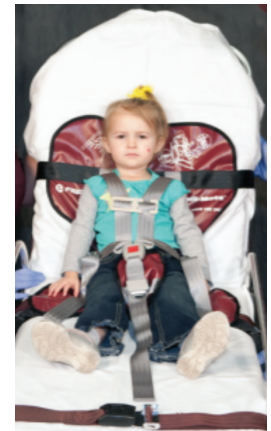
### TYPES OF RESTRAINTS:

1. Convertible (traditional) car seat with two belt paths (front and back) with four points for belt attachment to the cot is considered best practice for pediatric patients who can tolerate a semi-upright position.
  - a. Position safety seat on cot facing foot-end with backrest elevated to meet back of child safety seat.
  - b. Secure safety seat with 2 pairs of belts at both forward and rear points of seat.
  - c. Place shoulder straps of the harness through slots just below child's shoulders and fasten snugly to child.
  - d. Follow manufacturer's guidelines regarding child's weight.



**Note:** Non-convertible safety seats cannot be secured safely to cot. If child's personal safety seat is not a convertible seat, it cannot be used on the cot.

2. Stretcher harness device with 5-point harness (examples: Ferno Pedi-Mate, SafeGuard Transport, ACR)
  - a. Attach securely to cot utilizing upper back strap behind cot and lower straps around cot's frame.
  - b. 5-point harness must rest snugly against child. Secure belt at child's shoulder level so no gaps exists above shoulders.
  - c. Adjust head portion of cot according to manufacturer's recommendation.
  - d. Follow manufacturer guidelines for weight ratings.



Examples	Weight Range
Ferno Pedi-Mate	10-40 pounds
Ferno Pedi-Mate Plus	10-100 pounds
Quantum ACR4	4-99 pounds

3. Car bed with both a front and rear belt path (example: Dream Ride Infant Car Bed)
  - a. For infants who cannot tolerate a semi-upright position or who must lie flat.
  - b. Position car bed so infant lies perpendicular to cot, keeping infant's head toward center of patient compartment.
  - c. Fully raise backrest and anchor car bed to cot with 2 belts, utilizing the 4 attachment sites supplied with car bed.
  - d. Only appropriate for infants from 5 – 20 lbs.





# Pediatric Transportation

4. Isolette/Incubator must be secured to ambulance according to manufacturer's guidelines.
  - a. Secure infant using manufacturer's restraint. (Five-point harness restraint is preferred.)
  - b. Blankets or towels may be used for additional stabilization

## NON-PATIENT TRANSPORT

Best practice is to transport well children in a vehicle other than the ambulance, whenever possible, for safety.

If no other vehicle is available and circumstances dictate that the ambulance must transport a well child, he/she may be transported in the following locations:

1. Captain's chair in patient compartment using a size appropriate integrated seat or a convertible safety seat.
2. Passenger seat of the driver's compartment if child is large enough (according to manufacturer's guidelines) to ride forward-facing in a child safety seat or booster seat. Airbag should be turned off. If the air bag can be deactivated, an infant, restrained in a rear-facing infant seat, may be placed in the passenger seat of the driver's compartment.



## USE OF PATIENT'S CHILD SAFETY SEAT AFTER INVOLVEMENT IN MOTOR VEHICLE CRASH

The patient's safety seat may be used to transport child to the hospital after involvement in a minor crash if ALL of the following apply:

1. It is a convertible seat with both front and rear belt paths.
2. Visual inspection, including under movable seat padding, does not reveal cracks or deformation.
3. Vehicle in which safety seat was installed was capable of being driven from the scene of the crash.
4. Vehicle door nearest the child safety seat was undamaged.
5. The air bags (if any) did not deploy.

## MOTHER AND NEWBORN TRANSPORT

1. Secure and transport mother on the cot.
2. Consider transporting mother and newborn in separate ambulances to properly secure each patient to a cot.
3. Transport newborn secured to the rear-facing provider seat /captain's chair using a size-appropriate child restraint system. Either a convertible safety seat with a forward-facing belt path or an integrated child restraint system certified by the manufacturer to meet FMVSS No. 213 may be used to secure infant.
4. Do NOT use a rear-facing only safety seat in the rear-facing provider seat / captain's chair as this is dangerous and may lead to significant injuries.

# Depression/Suicidal Ideation

1. Ensure the scene is safe and request law enforcement for patients actively threatening/attempting suicide
2. Assess the patient for need of medical treatment and follow appropriate protocol
3. Establish rapport with the patient by listening carefully and speaking in a non-confrontational manner.
4. Assess the patient
  - a. Has a suicide attempt been made? If yes, request ALS
  - b. **SAD PERSONS** Scale (report score to receiving hospital)  
1 point for each of the following
    - Sex: male
    - Age <20 or >44
    - Depression
    - Previous suicide attempt
    - Ethanol abuse
    - Rational thinking loss
    - Social supports lacking
    - Organized suicide plan
    - No spouse (divorced, widowed, single)
    - Sickness (chronic, debilitating, or severe)
  - c. Columbia Suicide Screening (if possible, discuss the following questions with the patient):
    - i. Have you wished you were dead or wished you could go to sleep and not wake up?
    - ii. Have you been thinking about how you might kill yourself?
    - iii. Have you taken any steps towards making a suicide attempt or preparing to kill yourself (such as collecting pills, getting a gun, giving valuables away or writing a suicide note)?
5. Provide constant, 1:1 supervision for the patient
6. Collect items such as toxic substances, alcohol, drugs and medications that may have been taken and transport with patient to the hospital
7. Provide support for family and friends who are present.
8. Obtain information from family and friends and obtain their contact information should the hospital have any questions.
9. Transport the patient to the closest facility that can meet their medical and psychiatric needs

Refer to **Grey 16** for Transport of Mentally Ill Patients protocol  
Refer to **Orange 2** for Restraint protocol  
Refer to **Orange 3** for Agitation/Excited Delirium protocol

## PEARL


A SAD PERSONS Score > 4 or a "yes" answer to any of the Columbia Suicide Screening questions may indicate that the patient requires psychiatric hospitalization. However, **all patients presenting with a psychiatric emergency should be transported to the hospital for evaluation.**

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# Restraints

In certain limited situations, when a patient poses a significant danger to self or others, it may be appropriate to restrain the patient involuntarily. Providers are cautioned to use physical restraint as a last resort, preferably with the assistance of local law enforcement. Once the decision is made to restrain a patient, the least restrictive restraint reasonable should be implemented and the patient should remain restrained until arrival at the emergency department, unless it interferes with the delivery of medical care. Only commercially available soft restraints are approved by Maine EMS.

## EMT/AEMT

1. Request law enforcement assistance
2. Request ALS
3. Attempt de-escalation techniques (speak in an honest, non-confrontational tone while avoiding eye contact).
4. Have appropriate personnel available prior to initiating restraints
5. Restrain patients in a lateral or supine position. **NEVER** leave patients restrained in a prone position. **NEVER** restrain a patient's hands and feet behind them (hog-tying). All applied restraints must be easy to remove should a medical emergency occur.
6. Never place objects on top of patients to restrain them.
7. Restrained patients require 1:1 observation by EMS personnel and require continuous cardiac, pulse oximetry and waveform capnography monitoring, if able to do so.
8. Contact **OLMC** as soon as logistically possible after securing the safety of the patient and providers. 
9. Documentation: Type of restraints used, how restraints applied, when restraints applied, why restraints applied (patient's behavior and mental status), the agency and individual that applied the restraints, frequent vital signs and CSM checks, education provided to patient and time **OLMC** notified.
10. Restraint devices applied by law enforcement require an officer's continued presence to ensure patient safety and allow for quick removal, if necessary. Law enforcement should accompany the patient in the ambulance.
11. Restrained patients should not be moved in a stair chair device as violent patients cannot properly be restrained in a stair chair and EMS personnel may be easily thrown off-balance by a resisting patient.
12. Restrained patients should be transported to the nearest emergency department that can safely accept the patient.

## PARAMEDIC

13. Refer to Agitation/Excited Delirium protocol, **Orange 3**

# Agitation/Excited Delirium #1

## EMT

1. Maintain crew safety; ask for law enforcement assistance, if available
2. Attempt verbal de-escalation using direct, empathetic and calm voice. Present clear limits and options. Respect the patient's personal space. Avoid direct eye contact and assume a non-confrontational posture
3. If altered mental status, check oxygen saturation and perform finger stick blood glucose, if so trained

## ADVANCED EMT

4. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**

## PARAMEDIC

5. Perform the Altered Mental Status Scale:

Score	Responsiveness	Speech	Facial Expression	Eyes
+4	Combative, very violent, out of control	Loud outbursts	Agitated	Normal
+3	Very anxious, agitated, mild physical element of violence	Loud outbursts	Agitated	Normal
+2	Anxious, agitated	Loud outbursts	Normal	Normal
+1	Anxious, agitated	Normal	Normal	Normal
0	Responds to name in normal tone	Normal	Normal	Clear, no ptosis
-1	Lethargic response to name	Mild slowing or thickening	Mild relaxation	Glazed or mild ptosis (<half eye)
-2	Responds only if name is called loudly	Slurring or prominent slowing	Mild relaxation (slacked jaw)	Glazed or marked ptosis (<half eye)
-3	Responds only after mild prodding	Few recognizable words	Mild relaxation (slacked jaw)	Glazed or marked ptosis (<half eye)
-4	Does not respond to mild prodding or shaking	Few recognizable words	Mild relaxation (slacked jaw)	Glazed or marked ptosis (<half eye)

Procedure for AMSS Assessment	Score
1. Observe the patient - if alert, restless, agitated or combative	0 to + 4
2. Say the patient's name in a gentle tone of voice and ask patient to open eyes	-1
3. If no response to voice, continue with routine EMS care and observe for response to routine interventions	-2 to -4

# Agitation/Excited Delirium #2

## PARAMEDIC

7. If Altered Mental Status Score +1, +2 or +3, consider midazolam 4-10 mg **IM** for patient/EMS provider safety and patient comfort. First dose should be based on patient's size, age, and the circumstances causing agitation
8. If Altered Mental Status Score +4, consider either:
  - \* Midazolam 4-10 mg **IM** for patient/EMS provider safety and patient comfort. First dose should be based on patient's size, age, and the circumstances causing agitation

---

-OR-

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\*contact OLMC for Ketamine 4 mg/kg **IM**. Ketamine may not be used in patients greater than 65 years old

- 
9. Monitor and document the following every 5 minutes - ECG, O<sub>2</sub> sat, ETCO<sub>2</sub>, AMSS, and vital signs
- 
10. Contact OLMC for dosing questions or if patient requires repeat dosing.
- 

## Pearls for Agitation/Excited Delirium

**Agitation** - is defined by excessive, purposeless cognitive and motor activity or restlessness, usually associated with a state of tension or anxiety

**Excited Delirium** - is a sub-category of agitation, with a potential for higher mortality and morbidity. It can be defined by a patient presenting with the following constellation of symptoms (based on the 2009 ACEP White Paper) with frequency in parenthesis:

- Exceptional/abnormal pain tolerance (100%)
- Tachypnea (100%)
- Tactile hyperthermia (95%)
- Unusual strength (90%)
- Police Noncompliance (90%)
- Lack of tiring against restraint (90%)
- Inappropriate clothing for environmental temperature (70%)
- Violent and paranoid behavior
- Rapid development of symptoms
- Rapidly and fluctuating periods of calm and then delirium

These symptoms may be caused by a number of intoxicants, including, but not limited to alcohol, sympathomimetics (cocaine, methamphetamine, MDMA), and dissociative agents (PCP, LSD, dextromethorphan, K2/Spice, Bath Salts, DMT, etc).

**Early contact of OLMC is essential for proper preparation of the receiving facility and staff.**



# Agitation/Excited Delirium #3

## Pearls

- Patient who are in a post-ictal state (i.e. have just suffered a seizure) are **NOT** considered to be in excited delirium and should **NOT** receive Ketamine
- Patients should **NOT** receive BOTH Midazolam and Ketamine due to concerns for potential additive effects and respiratory depression

## Pearls for Midazolam/Ketamine

### Midazolam

- Patients with underlying medical conditions (including COPD/CHF/CAD) as well as patients older than 60 are more likely to suffer adverse effects from midazolam. Consider lower doses in this population.
- **WARNING:** May cause respiratory depression, arrest, or apnea.
- Assess patients for signs and symptoms of respiratory depression and sedation.
- Administration: **IM** - Administer undiluted deep IM into large muscle.
- Administration: **IV** - Do not administer intra-arterially. Administer by **slow IV** injection over at least 2 minutes using a concentration of 1 mg/mL or a dilution of the 1 or 5 mg/mL concentrations.
- Concomitant use with opioids: **[US Boxed Warning]:** Concomitant use of benzodiazepines and opioids may result in profound sedation, respiratory depression, coma, and death.

### Ketamine

- Document the patient's Altered Mental Status Score (AMSS) in the run report.
- Patients with an AMSS less than 4 may be more likely to require airway management when receiving Ketamine, therefore Ketamine is to be used **ONLY** if the patient is suffering from excited delirium, as measured by an AMSS score of 4.
- Maine EMS Services will be stocking the 100 mg/mL concentration to accommodate the wide dose ranges in the protocol. This is to avoid carrying two very different concentrations and the risk of a serious dose error.
- **WARNING:** Overdose may lead to panic attacks and aggressive behavior; rarely seizures, increased ICP, and cardiac arrest. Very similar in chemical makeup to PCP (phencyclidine), but it is shorter acting and less toxic.
- Administration: **IM** - Inject deep IM into large muscle mass.
- Administration: **IV** - According to the manufacturer, administer bolus/induction doses over 1 minute or at a rate of 0.5 mg/kg/minute; more rapid administration may result in respiratory depression and enhanced pressor response. Some experts suggest administration over 2 to 3 minutes (Miller 2010).
- **The 100 mg/mL concentration should not be administered IV unless properly diluted with, at minimum, an equal volume of Sterile Water for Injection, NS, or D<sub>5</sub>W.**



# Do Not Resuscitate (DNR) Guidelines #1

## I. When to Start Resuscitation:

As soon as the absence of pulse and respiration is established.

## II. When Not to Start Resuscitation:

### A. All Patients:

1. When irreversible signs of death, such as rigor mortis, dependent lividity, decapitation, decomposition, incineration, other obvious lethal injuries are present.
2. When down time has been unknown or greater than 20 minutes with no bystander CPR performed and the patient is cool to touch (not from exposure), no audible heart sounds, and fixed/dilated pupils.
3. Core temperature less than 50 degrees F, chest wall so stiff that compressions cannot be performed, or patients submerged in cold water (for specific recommendations in drowning, refer to Drowning/Submersion Injuries protocol, **Yellow 11**)

**B. All Normothermic Patients:** Major trauma victims who have no respiration and no pulse, no signs of life at the time of Maine EMS-licensed crew member arrival

### C. When a **Do Not Resuscitate (DNR)** order is presented in one of three forms:

1. EMS DNR orders from other states' EMS/DNR programs. If the order or device (i.e. plastic bracelet, jewelry, or card) appears to be in effect, and is understandable to the crew, follow the order's specific instructions. If there are no specific instructions beyond "DNR", follow Maine EMS Comfort Care/DNR Guidelines, **Grey 2**
2. Non-EMS actionable medical order (i.e. POLST/MOLST, etc.). A written order executed by a patient's personal physician/PA/NP should be honored if it is understandable to the crew and if it is dated within 1 (one) year. Follow the order as written. If it is nonspecific as to the care to provide or withhold, follow the MEMS Comfort Care/DNR guidelines, **Grey 2**
3. Maine EMS Comfort Care/DNR Program - A Maine EMS Comfort Care/DNR order does not have an expiration date. Once activated, it remains in effect until the patient, or someone acting on their behalf as described and authorized on the Comfort Care/DNR form, cancels it. (Note: Although no longer distributed by Maine EMS, extant DNR/Comfort Care "orange" forms, wallet cards and plastic bracelets remain valid)

**D.** When a signed Maine EMS DNR Directive form or Maine EMS-approved DNR Directive jewelry is presented to EMS personnel - Once executed by the patient and signed by a physician/PA/NP, the DNR Directive remains in effect until the expiration date on the form or, if no expiration date is noted on the form, until the patient cancels it

**E.** A photocopy is acceptable as proof of the existence of valid DNR Order or DNR Directive, provided that the photocopy is legible and understandable by EMS personnel

# Do Not Resuscitate (DNR) Guidelines #2

## III. Treatment/Comfort Care

F. When treating a patient with a Maine EMS Comfort Care/DNR Order or DNR Directive, the responding EMS provider should perform routine patient assessment and resuscitation or intervention until EMS personnel verify:

1. That an EMS Comfort Care/DNR Order or DNR Directive exists; or,
2. That a Maine EMS-approved EMS Comfort Care/DNR wallet card, plastic bracelet or Maine EMS-approved DNR jewelry is present, intact and not defaced. The plastic bracelet may be worn on the wrist or ankle or on a necklace; or,
3. That Maine EMS-approved DNR Directive jewelry is present, intact and not defaced; and,
4. The identity of the patient through family or friends present, or with photo ID such as a driver's license. A good faith effort only is required

G. Follow these EMS Comfort Care/DNR procedures in all cases:

**1. These comforting interventions are encouraged:**

- a. Open the airway manually (NO intubation, No BVM unless invited by conscious patient);
- b. Suction and provide oxygen;
- c. Make the patient comfortable (position, etc.);
- d. Control bleeding;
- e. Provide pain and other medications of comfort only to a conscious patient (ALS per OLMC/Hospice provider);
- f. Be supportive of the patient and family;
- g. Contact patient's physician/PA/NP/Hospice provider or OLMC if questions arise

**2. Resuscitative measures to be avoided:** (to be withheld, or withdrawn if resuscitation has begun prior to confirmation of EMS Comfort Care/DNR Order or DNR Directive status).

- a. CPR;
- b. Intubation (ET Tube, or other advanced airway management);
- c. Surgical procedures;
- c. Defibrillation;
- d. Cardiac resuscitation medications;
- e. Artificial ventilation by any means;
- f. Related procedures per OLMC.

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# Do Not Resuscitate (DNR) Guidelines #3

## IV. Revocation, Documentation & When to Stop Resuscitation

### H. Who may revoke an EMS Comfort Care/DNR Order or Maine DNR Directive:

1. The patient (by destroying EMS Comfort Care/DNR Order Form, wallet card, plastic bracelet and DNR jewelry, or by destroying the DNR Directive and DNR jewelry, or verbally withdrawing the order or directive);
2. For the EMS Comfort Care/DNR Order form only:
  - a. The patient's physician/PA/NP who signed the order;
  - b. The Authorized Decision-Maker for the patient who signed the order.

### I. Documentation:

1. Use the Maine EMS patient/run report.
2. Describe assessment of patient's status.
3. Document which identification (i.e. form, wallet card, plastic bracelet or DNR jewelry) was used to confirm EMS Comfort Care/DNR or DNR Directive status and indicate that it was intact and not canceled.
4. Indicate the patient's physician/PA/NP name, on the patient/run report.
5. If the patient has expired on arrival, comfort the family and follow your EMS agency's procedure for death at home. A Maine EMS patient/run report still needs to be completed.
6. If transporting the patient, EMS providers should keep the original EMS Comfort Care/DNR Order Form, wallet card, plastic bracelet, DNR Directive form or DNR jewelry with the patient.

### J. When to Stop Resuscitation: Resuscitation should be terminated:

#### 1. Unwitnessed Arrest:

- a. When the patient regains pulse/respiration
- b. When criteria as defined in the Termination of Resuscitation protocol (**Red 13**) have been met.
- c. When the rescuers are physically exhausted or when equally or more highly trained health care personnel take over
- d. When it is found that the patient has a DNR order or other actionable medical order (i.e. POLST/MOLST etc.) form
- e. Continue resuscitation if conditions on scene are NOT amenable to cessation of resuscitation
- f. Continuation of resuscitation beyond these protocols must be in consultation with OLMC

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## Do Not Resuscitate (DNR) Guidelines #4

### 2. Witnessed arrest:

- a. When the patient regains pulse/respiration
- b. When criteria as defined in the Termination of Resuscitation protocol (**Red 13**) have been met.
- c. In the absence of ALS, when the same Maine EMS-licensed crew member has determined the absence of all vital signs for 20 minutes, in spite of BLS, except in the case of hypothermia (**Yellow 8**)
- d. When the rescuers are physically exhausted or when equally or more highly trained health care personnel take over.
- e. When it is found that the patient has a DNR or other actionable medical order (i.e. POLST/MOLST form, etc.) .
- f. Continue resuscitation if conditions on scene are NOT amenable to cessation of resuscitation
- g. Continuation of resuscitation beyond these protocols must be in consultation with OLMC

### V. Management of Bodies

If resuscitation efforts are discontinued, follow your service's policy for disposition of patient remains. In cases of uncertainty, arrangements should be made with OLMC with regards to disposition of the body. Contact your local ED with regard to tissue donation options and procedures in advance.

# Death Situations for Emergency Responders #1

**PREPARED JOINTLY BY:** Attorney General, Office of Chief Medical Examiner, and Maine State Police.

**GENERAL AIM:** Preservation of scene, including body as found, for investigative purposes within practical limits consistent with the role and responsibilities of emergency medical care givers.

## Death Situation Guidelines

**I. Preserve life:** While forensic guidelines emphasize that the scene should not be disturbed, the first and most important course of action is to follow all usual procedures to ensure the preservation of life.

**II. Once Death is confirmed:** *If the decedent is clearly dead, the body should not be moved or disturbed unless there is a danger that the body may be lost or further damaged.*

**A.** Maine statutes do not require a pronouncement of death.

**B.** The scene should be secured and left undisturbed.

**1.** If the police are present, they should take charge in order to determine whether the case falls under the jurisdiction of the Office of Chief Medical Examiner (OCME) or whether the death certificate may be certified by the patient's private attending physician.

**2.** If there is no police officer present, EMS should call the local police or call the OCME directly to report the case, so that a determination may be made as to the need for further investigation into the cause and manner of death. OCME emergency line to report deaths: 1-800-870-8744.

**3.** If it is determined not to be a Medical Examiner case, try to accommodate the family's request or contact OLMC for guidance.

**4.** Consider contacting the New England Donor Services 1-800-446-6362

**C.** Tubes and medical devices should be left in place. Certain reusable equipment may be removed to resupply the ambulance; however, written documentation of any such action must be given to investigators.

**D.** Any clothing or property should be left undisturbed.

**III. What is a Medical Examiner (ME) case?:**

**A.** Any suspected HOMICIDE

**B.** Any suspected SUICIDE

**C.** Any death involving any ACCIDENT or INJURY

**D.** Any death of a CHILD

**E.** Any death in CUSTODY

**F.** Deaths caused by SUSPECTED GROSS NEGLIGENCE during a Medical Procedure

**G.** SUDDEN DEATH from an UNKNOWN cause or any death where there is no private attending physician

**H.** UNIDENTIFIED persons

**I.** OCCUPATIONAL deaths (work-related)

**J.** Unnatural deaths in a Mental, or-DHS Residential Care Facility

**K.** Any death that might ENDANGER or THREATEN the public health

## Death Situations for Emergency Responders #2

### IV. Deaths in Children:

- A. All deaths in children under the age of three automatically become Medical Examiner cases unless the death is expected based on previously diagnosed natural disease.
- B. Determination of the cause of death in infants and children is very difficult. While the OCME understands the concerns of the parents/guardians, the child must be left undisturbed until investigating police officers have finished the initial investigation. SIDS is not an acceptable reason to transport a deceased infant or allow the infant to be moved prior to investigation.

### V. Reports and follow-up on Medical Examiner cases:

- A. If families have questions, they may be referred to the OCME. Families should call the office using the 24 hour business line at 207-624-7180
- B. Copies of EMS run sheets should be given to police investigators and/or the OCME (refer to **Brown 2**)
- C. If any EMT wishes follow-up information on any specific case, or if there is a question of infectious exposures, call the OCME on the business line, 207-624-7180.



# Mass Casualty/Disasters/HazMat #1

**GENERAL RESPONSIBILITY FOR DECEASED PERSONS:** The Office of Chief Medical Examiner is responsible for deceased victims of mass disasters including identification and removal from the scene. The Office of Chief Medical Examiner (1-800-870-8744, restricted emergency call number) should be informed immediately of any multiple fatality situations.

1. BODIES SHOULD BE LEFT IN PLACE AT THE SCENE except when they must be moved to preserve them from destruction or when they block access. The resting place of the victim may be critical for identification of the body and/or reconstruction of the incident. They can be tagged as fatalities to prevent other medical personnel from repeating examination.
2. IF DEATH OCCURS EN ROUTE TO THE HOSPITAL, the body need not be returned to the scene but can be brought to the hospital or other suitable storage place as determined by distances and/or the needs of other patients in the ambulance. If the body is left anywhere other than the hospital or designated temporary morgue, the body should be tagged and the Office of Chief Medical Examiner should be advised.
3. THE SITE A VICTIM IS REMOVED FROM SHOULD BE NOTED on a tag along with the name and agency of the person who removed it whenever removal is needed and in cases of death after removal. Such information may be critical for identification of the body and/or reconstruction of the accident.
4. IF AN IDENTIFICATION OF A PATIENT IS MADE, a tag with at least the name and date of birth and time of death of the patient/decedent along with the identifier's name, relationship, address and where he/she can be located should be put on the body.
5. PERSONAL PROPERTY SHOULD BE LEFT WITH THE BODY including clothing removed from a patient if the victim dies. Nothing should be removed from those already deceased.

Consistent with New England EMS Council MCI Management, the action priorities for the first medical crews arriving on the scene are:

1. Assess and avoid exposure to existing dangers
2. Notify dispatch of type of MCI and estimate of number and type of patients
  - a. Request EMS, fire, police assistance
  - b. Request hospital notification
3. First ambulance or other vehicle with medical frequencies becomes EMS command vehicle – locate near fire and police command vehicles. Strip equipment/supplies – place in equipment area (near planned patient collection/treatment area).
4. Designate, in the following order, the following positions as qualified personnel become available:

**EMS CONTROL OFFICER** – Reports to Incident Commander. Responsible for overall patient triage, treatment, and transportation. Procures EMS back-up, supplies, equipment, transport vehicles as needed, supervises and assigns all other medical personnel.

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## Mass Casualty/Disasters/HazMat #2

**PRIMARY TRIAGE OFFICER** – Rapidly assesses all patients then assigns personnel to provide treatment to those patients in most need of immediate treatment, who will most benefit from immediate care with the resources available. Treatment is limited to:

- Bleeding – hemorrhage control
- Airway – reposition patient
- Shock – elevate extremities

**SECONDARY TRIAGE OFFICER** – Rapidly tags all patients, or assigns personnel to do tagging (with METTAGS, SMART Tags, or other locally approved Triage System) and, supervises immobilization after classification, and oversees transfer to collection/treatment area.

Tag categories are:

**RED (I):** Conditions requiring immediate transport by ambulance to prevent jeopardy to life or limb and which will not unduly deplete personnel/equipment resources (examples: progressive shock, major blood loss, major multiple injuries, severe respiratory distress. Cardiac arrest – only if personnel can be spared).

**YELLOW (II):** Not requiring immediate transport to prevent jeopardy to life or limb, but eventually will require ambulance transport to hospital for attention.

**GREEN (III):** Minor conditions probably not requiring ambulance transport to hospital.

**BLACK (O):** Are obviously dead, or dying from lethal injuries, or requiring CPR when no personnel are available to do so without compromising other patients.

**TREATMENT OFFICER** – Sets up / supervises patient collection / treatment area. Reassesses and re-tags (if necessary) patients, assigns patients and personnel to treatment areas. Prioritizes for transport. Coordinates with Loading/Transport Officer to make single radio transmission to receiving facility (pt. ID#, METTAG priority, nature of injury, ambulance, and ETA ONLY).

**LOADING OFFICER** – Stages ambulances in holding area. Instructs crews to put all available equipment in equipment area. Assigns patients to vehicles. Directs drivers to hospital(s). Instructs not to contact hospital unless OLMC required for condition change. Notifies hospital, or coordinates communication to hospital notification times, patient ID#s and destination of all transporting vehicles.

In the event of a public health emergency or declared disaster, EMS providers may be asked to divert selected patients with certain conditions to hospital-established or state-established alternate care sites by OLMC.

# Suggested Scene Organization (Not for HazMat)

## INCIDENT COMMAND POST



## EMS CONTROL OFFICER

EQUIPMENT

AMBULANCE

LOADING

RED

PRIMARY  
TRIAGE  
OFFICER

LOADING  
OFFICER

TREATMENT  
OFFICER

YELLOW

SECONDARY  
TRIAGE  
OFFICER

GREEN

TRIAGE / HOLDING AREA

I  
N  
C  
I  
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# Sexual Assault Victim

## ALL LEVELS

1. Treat any life-threatening emergency first and according to these protocols.
2. Try to attend to maintenance of forensic evidence. Try not to cut through tears or stains in clothing. Do not cleanse any skin area more than necessary to provide immediate care.
3. If the patient so desires and/or mandated reporting is indicated, police should be called if they have not already been notified.
4. If no life-threatening situation is present, prehospital care may require waiting for police to secure the scene which is a potential crime scene.
5. Victims of sexual assault commonly have much guilt, and may require psychological support. Please respect the stress that they are enduring.
6. By nature of this event, any touch may be traumatic for this patient. Overtly and repeatedly explain what you are doing to try to lessen the impact of procedures and touching.
7. Advise the patient not to eat, drink, smoke, bathe, change clothing or go to the bathroom, if at all possible, in order to preserve any forensic evidence. If they must urinate, request that they do not wipe.
8. If the patient has removed any clothing worn in the assault, each piece of clothing should be separately bagged in paper bags and brought to the hospital with the patient.
9. When transporting the patient, it is preferable, whenever possible, to have a same sex provider as the primary provider. If the assault is a same sex assault, then a provider of the opposite sex may be more comfortable for the patient.
10. To maintain privacy and confidentiality, use a land-line for hospital reporting, whenever possible, and do not clarify the type of assault, only that you are transporting a "victim of assault."
11. The patient should be encouraged to go to the hospital for a sexual assault forensic examination that would allow not only the option to have collection of forensic evidence, but also treatment of possible injuries, the chance to obtain pregnancy and sexually transmitted disease prophylactic treatment, and appropriate counseling.
12. If the patient refuses treatment and/or transportation to the hospital, document all findings and observations as completely as possible. When signing the patient off at the scene, try to have a police officer witness this sign off.

# Child Abuse

## Management and Reporting #1

**CHILD ABUSE**  
**(Title 22 M.R.S., Chapter 1071, Subsection 4011-A)**

### All levels

- Child abuse and child neglect are sufficiently widespread to guarantee that virtually every EMS provider will encounter them at least once during his/her career.
- It is estimated that approximately 2-3 million cases occur each year or approximately 11 cases per every 1,000 children within the U.S. Each year at least 2,000 children die from physical abuse.
- The most commonly identified forms of abuse by the EMS provider are physical abuse and severe physical neglect, although sexual abuse may, on occasion, be observed.
- The EMS provider must at all times demonstrate and maintain a supportive and non-judgmental attitude with primary caregivers. Accusation and confrontation delay immediate treatment as well as transportation to a definitive care facility.
- When abuse is a possibility, the healthcare professional has two major responsibilities: first, to provide medical care to the child; and second, to collect and document all information that may possibly establish the occurrence of abuse or neglect. Refrain from asking the child too many questions and specifically do not ask any leading questions – keep questions simple and open-ended such as “What happened?” and “Are you hurt?”
- As an EMS provider, you must report immediately to Child Protective Services any child whom you have “reasonable cause to suspect” has been abused or will be abused. Failure to do so is punishable as a civil violation. It is not enough to tell someone else of your suspicions. If a child is abused and unreported, there is a 50% chance that the child will be abused again and a 10% chance that the child will die from future abuse.

### Possible Indicators of Abuse

1. Injured child under two years of age, especially hot water burns or fractures
2. Facial, mouth, or genital injuries
3. Atypical, diffuse, and/or severe injuries – especially when not over bony prominences
4. Poor nutrition or poor care
5. Delay in seeking treatment or not wanting the provider to speak alone with the child
6. Vague, inconsistent, or changing history
7. Refer to appropriate protocol for the comatose child, **Gold 5**, the child in shock, **Gold 14** or the child in cardiac arrest, **Red 8**

### Treatment of suspected child abuse in the field

1. Suspect abuse but do not accuse the caretaker. Every time a child is encountered by the healthcare professional having a traumatic injury, the question that should come to mind is, “Could this be abuse?”. In most cases the answer will be an obvious “no”; however, enough uncertainty will exist in some cases to warrant further assessment.
2. Follow normal initial assessment priorities of the ABC’s and mental status when caring for the child.
3. Provide the appropriate intervention procedures for any abnormal findings such as respiratory, trauma, shock, altered mental status or other medical emergencies.

# Child Abuse

## Management and Reporting #2

4. EMS providers are in key positions to assess environmental conditions and the observable interactions of family and child. Environmental signs of possible abuse or neglect may include, but are not limited to: unsanitary conditions; garbage scattered about the house; unsafe conditions such as open, unguarded windows or potentially dangerous objects within reach of children.
5. Perform a detailed physical examination on any child in stable enough condition to allow for such. Examine all parts of the body for deformities, ecchymosis, lacerations, abrasions, punctures, burns, tenderness, and swelling. It is vitally important that injuries of the mouth and sternum be observed in detail prior to the initiation of resuscitative measures and documented that such injuries were found prior to resuscitation.
6. It is important to transport all children having evidence of abuse or neglect due to the possibility of additional injuries not immediately obvious. Transport of potentially abused or neglected children ensures that they receive the appropriate and necessary social service. Assistance may be necessary from law enforcement, OLMC, etc.
7. Convey your impressions and information to the hospital staff.
8. Write a detailed and descriptive report, which provides an accurate and clear record of all observations and treatment from the time of the initial call through transfer of the patient to the ED staff. Do not make a diagnosis of abuse, and refrain from including personal opinions, emotional overtones, or interpretations. Primary caregiver quoted statements must be documented as such with quotation marks, and exactly word for word as stated by the person. As well, this legal document must be legible.
9. You must contact Adult **(1-800-624-8404)** and Children's **(1-800-452-1999)** Emergency Services at to make a report. This is a 24-hour a day reporting number. You will be protected, by law, from civil liability for making such a report, if made in good faith. Title 22 MRSA, Chapter 1071, Subsection 4014

### **AN ACT TO STRENGTHEN THE LAWS GOVERNING MANDATORY REPORTING OF CHILD ABUSE OR NEGLECT.**

#### **(Title 22 M.R.S. Section 4011-A, Subsection 7)**

"Children under 6 months of age or otherwise non-ambulatory. A person required to make a report under subsection 1 shall report to the department if a child who is under 6 months of age or otherwise nonambulatory exhibits evidence of the following:

- a. Fracture of a bone;
- b. Substantial bruising or multiple bruises;
- c. Subdural hematoma;
- d. Burns;
- e. Poisoning; or
- f. Injury resulting in substantial bleeding, soft tissue swelling, or impairment of an organ."

#### **(Title 22 M.R.S. Section 4011-A, Subsection 9)**

**"Training requirement:** A person required to make a report under subsection 1 shall complete, at least once every 4 years, mandated reporter training approved by the department."



# Adult Abuse, and Intoxicated Drivers

## **ADULT ABUSE (Title 22 M.R.S., Chapter 958-A, Subsection 3477)**

“Reasonable cause to suspect. The following persons while acting in a professional capacity...ambulance attendant, emergency medical technician or other licensed medical service provider, Unlicensed assistive personnel shall immediately report to the department when the person knows or has reasonable cause to suspect that an incapacitated or dependent adult has been or is likely to be abused, neglected or exploited.”

Call Adult Protective Services: **1-800-624-8404** (24 hours a day). Similar protection from liability for reporting exists.

## **INTOXICATED DRIVERS (Title 29- A)**

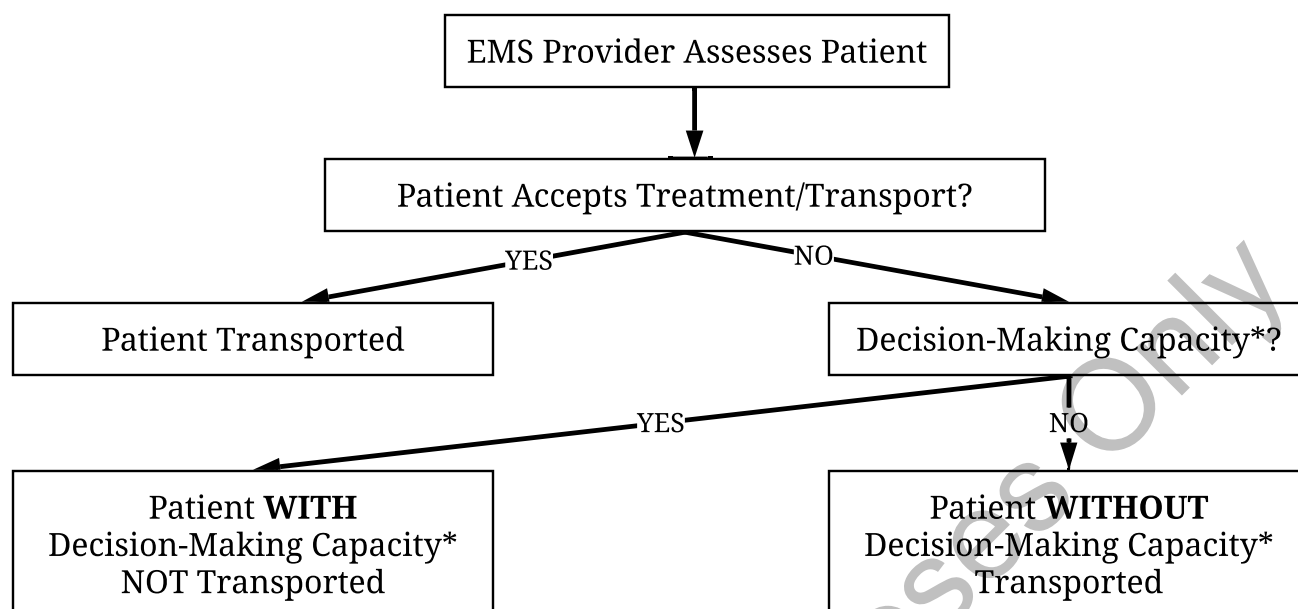
§ 2405 (1) “Persons who may report If, while acting in a professional capacity a...emergency medical services person...knows or has reasonable cause to believe that a person has been operating a motor vehicle, hunting or operating a snowmobile, all-terrain vehicle or watercraft while under the influence of intoxicants and that motor vehicle, snowmobile, all-terrain vehicle or watercraft or a hunter has been involved in an accident, that person may report those facts to a law enforcement official.”

§ 2405 (2) Immunity from liability. A person participating in good faith in reporting under this section, or in participating in a related proceeding, is immune from criminal or civil liability for the act of reporting or participating in the proceeding.

§ 2524 (1) Persons qualified to draw blood for blood tests. “Only a physician, registered physician's assistant, registered nurse or person whose occupational license or training allows that person to draw blood samples may draw a specimen of blood for the purpose of determining the blood-alcohol level or the presence of a drug or drug metabolite.”

§ 2528 Liability. “A physician, physician's assistant, registered nurse, person whose occupational license or training allows that person to draw blood, hospital or other health care provider in the exercise of due care is not liable for an act done or omitted in collecting or withdrawing specimens of blood at the request of a law enforcement officer pursuant to this chapter.”

# Transport Protocol #1



\*A patient without decision making capacity would be one who has one or more of the following: an altered mental status or intoxicated, confused, delirious, psychotic, comatose, unable to understand the language, or is a minor, etc.

1. If there is a question of decision making capacity or the patient does not appear to understand the consequences of his/her refusal of transport, then contact OLMC.
2. The patient must be informed of the consequences of his/her refusal to be transported. This must be documented in the patient care report.
3. This screening may typically arise when an ambulance is requested by someone other than the patient (i.e. the police, a bystander). The EMS run report must always be completed.
4. If the patient refuses transport and is judged to be without decision making capacity, the EMT must speak directly with OLMC. If unable to reach OLMC, the patient is transported.
5. **EMS System initiated patient sign offs are tremendously risky interactions and are not condoned by Maine EMS.**
6. **The service is expected to review all patient sign offs through the service's quality assurance mechanism. Patient medical records must be completed for all of these interactions, and must include the following information:**
  - a. The patient must be calm, competent, sober, and alert with the absence of any acute medical/surgical or traumatic process that impairs the patient's decision-making capacity
  - b. Greater than 18 years, emancipated, or contact with guardian
  - c. Service(s) offered
  - d. Reason service(s) declined
  - e. Statement of risks and patient understanding of risk
  - f. Discussion of alternatives to service offered and potential consequences of declining offered service
  - g. Discussion with patient that EMS services may be accessed at any time, and that the patient had decision making capacity.

## Transport Protocol #2

7. In some circumstances, patient transport is requested by an off site medical provider. Should a patient refuse transport and be found to have decision making capacity, EMS providers should communicate the discovery of decision making capacity and the patient's right to refuse transfer with invested parties. OLMC, or the physician ordering transport, must be contacted by EMS in this decision making process. It is suggested that the consulted physician discuss the refusal of care or transport directly with the patient.
8. When the patient is found to lack decision-making capacity but continues to refuse transport, contact OLMC for assistance. Should the patient continue to refuse transport, consider accessing other community advocates and resources (such as family/friend when appropriate and/or police). Consider direct dialogue between OLMC and the patient or OLMC and law enforcement to assist in resolving the conflict.

For Historical Purposes Only

# Transport of Mentally Ill Patients

Maine EMS personnel are generally called to transport a mentally ill patient in one of two situations:

## **Emergency Transport**

Safety for the patient and the crew is the primary concern in the transport of the mentally ill patient. Personnel should make sure they do a thorough evaluation of the patient to find and treat possible medical causes of the behavior. Refer to the Agitation/Excited Delirium protocol, **Orange 3**.

All diagnostic and therapeutic interventions administered by EMS providers are pursuant to the prescriptive authority of a physician. In certain limited situations, when a patient poses a significant danger to self or others, it may be appropriate to restrain the patient involuntarily. Providers are cautioned to use physical restraint as a last resort, preferably with the assistance of local law enforcement, refer to **Orange 2**. Once the decision is made to restrain a patient, the least restrictive restraint reasonable should be implemented and the patient should remain restrained until arrival at the emergency department, unless it interferes with the delivery of medical care. Only commercially available soft restraints are approved by Maine EMS.

## **Non-Emergency Transfer**

Mentally ill patients who are being transferred usually fall into one of these categories:

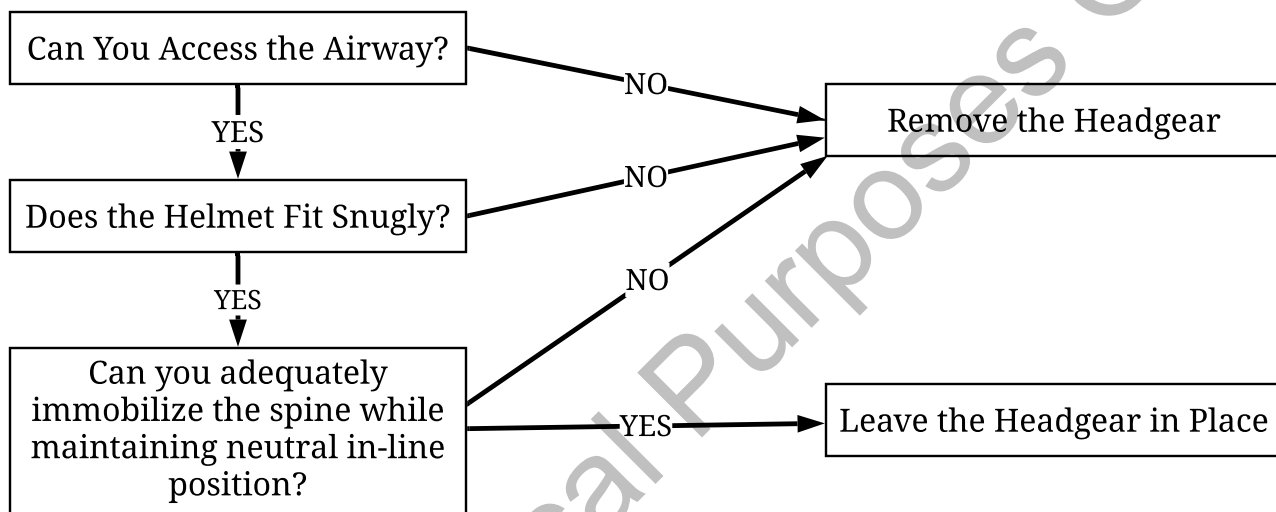
**Voluntary Committal** – These patients have agreed to be transferred to a facility for evaluation and treatment of an underlying mental illness. It is important to get a thorough report on the patient prior to transport to avoid surprises en route. Voluntary committal patients can change their mind during transport. In this case, it is the responsibility of the EMS personnel to discharge the patient at a safe location, preferably at the originating facility. If it is not possible to return the patient to the originating facility, notify local law enforcement to meet you at your location.

**Involuntary Committal** – Patients who are being committed involuntarily must have committal papers (blue papers) completed prior to transport. Between the hours of 7 a.m. and 11 p.m. a judge has to sign the committal papers. After 11 p.m. and before 7 a.m. the papers do not have to be signed except for Riverview Psychiatric Center (formerly AMHI) – this is known as the “pajama clause”. Make sure that the transporting service is listed correctly on the papers. According to Maine law, the patient must be transported in the least restrictive form of transportation available. Make sure you get a thorough history to determine whether restraints will be necessary. *If the receiving facility refuses to accept the patient after evaluating them, the transporting service is required, by law, to transport the patient back to the originating facility.*

# Protective Headgear Removal

The decision to remove protective headgear from an injured patient rests with the EMS provider on scene unless a Maine licensed physician is on scene and takes responsibility for the patient. It is important to immobilize the patient in a neutral in-line position, regardless of whether or not you choose to remove the helmet. This requires that you evaluate each patient and determine if other equipment (i.e. shoulder pads) must be removed or if additional padding under the shoulders or head is necessary. *In the case of an athletic injury, the EMS provider should consider input from athletic trainers. Disputes should be referred to OLMC for resolution.*

When deciding whether to remove protective headgear, please evaluate the following criteria:



# Defibrillation/Cardioversion Settings

## DEFIBRILLATION SETTINGS\*

	Initial	Second	Third	Subsequent
Adult	Per device recommendations* If unknown, use maximum available energy		Maximum available energy	Maximum available energy
Pediatric	2 J/kg	4 J/kg	6 J/kg	Max 10 J/kg

\* Each device manufacturer recommends initial adult defibrillation settings. Please follow the recommendation of your device manufacturer.

\*\* All settings are biphasic. If using monophasic machine refer to manufacturer recommendations.

## CARDIOVERSION SETTINGS\*

	Initial	Second	Third	Subsequent
Adult VT (wide regular)	100 J	150 J	200 J	Maximum available energy
Adult SVT (narrow regular)	50 J	100 J	120-150 J	Maximum available energy
Adult A-fib (narrow irregular)	120-200 J	200 J	Maximum available energy	
Pediatric	0.5-1.0 J/kg	2 J/kg	2 J/kg	2 J/kg

\* All settings are biphasic. If using monophasic machine refer to manufacturer recommendations.

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# Maine EMS Medication List

The following are medications currently approved for use by Maine EMS licensees - as authorized by the Maine EMS Protocols. This list may be altered through protocol revision.

## Prehospital Medications:

Acetaminophen chewable tablets  
Activated Charcoal (without sorbitol)  
Adenosine  
Albuterol  
Amiodarone  
Aspirin  
Atropine  
Cyanide poisoning kit contents  
Calcium Gluconate  
Dexamethasone  
Dextrose (D<sub>10</sub>, D<sub>50</sub>)  
Diphenhydramine  
EPINEPHrine 1 mg/mL & 1 mg/10mL  
EPINEPHrine Auto-injector  
Fentanyl  
Glucagon  
Hemostatic Agents  
Heparin Solution (for use in maintaining IV access in a heparin lock only; otherwise this is not considered a prehospital medication. Approved also at Advanced EMT level).  
Ipratropium Bromide (Combivent)  
Ketamine  
Lidocaine 2% (preservation free)  
Magnesium Sulfate  
Metoprolol (Lopressor)  
Midazolam  
Naloxone (Narcan)  
Nitroglycerin (Non-parenteral)  
Nitrous Oxide  
NOREPInephrine  
Oxygen  
Ondansetron IV and ODT  
Tetracaine Ophthalmologic Drops  
Tranexamic Acid (TXA)  
Sodium Bicarbonate

# Telephone/Radio Reference/Contact Numbers #1

	NAME	Radio Frequency	Phone Number
Hospital:			
Hospital:			
Hospital:			
Hospital:			
Hospital:			
Hospital:			
Dispatch:			

State wide EMS Frequency 155.3850

Maine EMS Phone: (207)626-3860;  
e-mail: maine.ems@maine.gov

Fax: (207)287-6251  
www.maine.gov/ems

J. Sam Hurley, NRP, Director  
Jason Oko, Paramedic, Licensing Agent  
Jessica Ricciadelli, Licensing Assistant  
(Vacant) Data & Preparedness Coordinator  
Chris Azevedo, NRP, Education & Training Coordinator  
Marc Minkler, NRP, EMS-C Coordinator  
State Medical Director: Matthew Sholl, M.D.  
State Assistant Medical Director: Kate Zimmerman, D.O.

**Region 1** – Atlantic Partners EMS, Inc  
e-mail: office@apems.org  
Medical Director: Mike Bohanske, M.D.

(207)741-2790  
Rick Petrie, Coordinator

**Region 2** – Tri-County EMS  
e-mail: lebrunj@cmhc.org  
Medical Director: Seth Ritter, M.D.

(207)795-2880  
Joanne LeBrun, Coordinator

**Region 3** - Atlantic Partners EMS, INC.  
e mail: office@apems.org  
Medical Director: Timothy Pieh, M.D.

(207)877-0936  
Rick Petrie, Coordinator

**Region 4** - Atlantic Partners EMS, Inc.  
e-mail: office@apems.org  
Medical Director: David Saquet, DO

(207)974-4880  
Rick Petrie, Coordinator

## Telephone/Radio Reference/Contact Numbers #2

**Region 5 – Aroostook EMS**  
e-mail: arems@maine.rr.com  
Medical Director: Beth Collamore, M.D.

(207)492-1624  
Benjamin Zetterman, Coordinator

**Region 6 - Atlantic Partners EMS, Inc.**  
e-mail: office@apems.org  
Medical Director: Matthew Opacic, MD

(207)877-0936  
Rick Petrie, Coordinator

**Maine ACEP Representative**  
Kevin Kendall, M.D.

**At-Large Representative**  
Peter Tilney, DO

**Clinical Pharmacist/Pharmacology Representative**  
Bethany Nash, PharmD, AEMT

### **Bioterrorism /WMD**

If you suspect a chemical or biological agent threat, call your local law enforcement agency immediately.

Maine Bureau of Health Emergency  
Reporting and Consultation  
Maine National Guard 11th Civil Support Team (WMD)  
Maine Emergency Management Agency

1-800-821-5821  
207-877-9623  
207-624-4400

### **To Report Workplace Injury:**

Bureau of Labor  
Business Hours  
Evenings & Weekends

207-623-7923  
207-592-4501

## Additional Contact List

Adult Protective Services	1-800-624-8404	
Child Abuse Reporting	1-800-452-1999	
Divers Alert Network Emergency Hotline	1-919-684-9111	
New England Donor Services	1-800-446-6362	
Office of the Chief Medical Examiner	1-800-870-8744	207-624-7180
Poison Control Center	1-800-222-1222	
Bureau of Labor Standards	207-623-7923	207-592-4501
Bureau of Health Emergency Reporting (DHHS)	1-800-821-5821	
Maine Emergency Management Agency	207-684-4400	

### Trauma & Cardiac Centers

Maine Medical Center  
22 Bramhall St  
Portland, ME 04102  
207-662-2950

Central Maine Medical Center  
300 Main St  
Lewiston, ME 04240  
207-782-1110  
207-795-2200

Northern Light/Eastern Maine Medical Center  
489 State St  
Bangor, ME 04401  
207-973-8000

### EMS Offices

Maine Emergency Medical Services  
45 Commerce Dr - Suite 1  
152 State House Station  
Augusta, ME 04333  
207-626-3860

Atlantic Partners (Southern Maine) EMS  
253 Warren Ave  
Portland, ME 04001  
207-536-1719

Tri County EMS  
300 Main St  
Lewiston, ME 04240  
207-795-2880

Atlantic Partners (Kennebec Valley) EMS  
71 Halifax Ave  
Winslow, ME 04901  
207-877-0936

Atlantic Partners (Northeast) EMS  
354 Hogan Rd  
Bangor, ME 04401  
207-974-4880

Aroostook EMS  
111 High St., Ste 1  
Caribou, ME 04736  
207-492-1624

# Non-EMS System Medical Interveners

Thank you for your offer of assistance.

Please be advised that these Emergency Medical Technicians are operating under the authority of the State of Maine and under protocols approved by the State of Maine. These EMS providers are also operating under the authority of a Medical Control physician and standing medical orders.

If you are currently providing patient care, you will be relinquishing care to these EMS personnel and their Medical Control physician.

No individual should intervene in the care of this patient unless the individual is:

1. Requested by the attending EMT, **and**
2. Authorized by the Medical Control physician, **and**
3. Is capable of assisting, or delivering more extensive emergency medical care at the scene

**If you are the patient's own physician, PA, or nurse practitioner, the EMTs will work with you to the extent that their protocols and scope of practice allow.**

**If you are not the patient's own physician, PA, or nurse practitioner,** you must be a Maine licensed physician who will assume patient management and accept responsibility. These EMTs will assist you to the extent that their protocols and scope of practice allow. They will not assist you in specific deviations from their protocols without Medical Control approval. This requires that you accompany the patient to the hospital and that their Medical Control physician is contacted and concurs.

The EMS providers or medical control may request that you provide evidence that you are a Maine licensed physician: a copy of your pocket card, an identification issued by a Maine Hospital or healthcare agency, or confirmation of active license status through the Maine Board of Medicine or Nursing website at:

<https://www.pfr.maine.gov/ALMSOnline/ALMSQuery/SearchIndividual.aspx?Board=383>

MDs, DOs, PAs and NPs are listed at the same website.

For MDs and PAs - select Regulator "Medicine"

For DOs - select Regulator "Osteopathic Medicine"

For NPs - Select Regulator "Nursing"

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