PREHOSPITAL TREATMENT PROTOCOLS

Effective
January 31, 2024

(Minor editing and K9 protocols added January 14, 2025)

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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 clinicians 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). The MDPB may entertain substitutions as needed for drug shortages.

January 31, 2024 Protocol Authors and Contributors

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The Maine EMS Prehospital Treatment Protocols are dedicated to Maine's EMS clinicians, 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 clinicians 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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LEGEND

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

A — Denotes the scope of care for the Advanced Emergency Medical Technician (AEMT)

P — 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 clinicians 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 clinician 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 clinician's level of training and licensure.

EMS clinicians 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 clinicians 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 clinician cannot contact OLMC, then the EMS clinician 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 clinician'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.

- **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, the Stroke Protocols, regional destination protocols such as the STEMI/ACS protocols, as well as others.

- **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. **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 ALS clinicians 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 clinicians. 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 and within the time frame required by Maine EMS Rules and Regulations.

- **Quality Assurance:** All EMS clinicians 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 clinicians 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 clinician has not been trained in a particular treatment listed at their level, or if that treatment is not within the EMS clinician's scope of practice, the clinician 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.

- **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 clinician. The reasons for deviating from these protocols must be documented in the patient's chart. Under such circumstances, if the ALS clinician agrees, the ALS clinician 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 clinicians in the home:** Other healthcare clinicians in the home attending the patient (i.e. R.N., L.P.N., C.N.A., Nurse Midwife, Hospice Nurse, 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.

- **Home healthcare devices and appliances**: Patients may have devices and appliances (drains, ports, LVADs, insulin pumps, etc.) with which they are routinely discharged home. Patients (or their licensed care clinicians 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 clinicians 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.

- **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 clinician agrees transport is not warranted
  b. The patient refuses transport but the clinician does not feel this is safe
  c. The patient requests transport but the clinician 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 clinician deems it inappropriate, please refer to OLMC. **EMS System-initiated patient sign-offs (i.e. when the patient requests transfer but the EMS clinician 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 care reports must be completed for all of these interactions.**

- **Vital Signs:** The MDPB believes that vital signs are essential pieces of information to be acquired on all patients. In addition, the MDPB believes that vital signs should be trended on all patients. In most cases, vital sign trending should occur every 5-10 minutes, based on the patient's clinical status and other operational considerations.

- **Transfer of Care** When transferring care of a patient, an on-duty EMS clinician must ensure the receiving caregiver is licensed at an equal or higher level unless the patient's condition and reasonably anticipated complications can be effectively managed by a lower-level clinician's scope of practice. However, a patient who receives interventions at a higher level on scene shall only have care transferred to the same or higher-level clinician.

Foreword

- **Maine EMS Special Circumstance Protocols**: Maine EMS protocols are intended to address the vast majority of medical emergencies encountered by an EMS clinician. 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 clinician 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 clinicians. 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. For Pediatric patient guidance, refer to Pediatric Transport Protocol, **Pink 11 - 12**.

- **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 clinician at any level may assist the patient if the patient can confirm that the device is a VNS and after the EMS clinician 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 clinician. 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 clinician'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 clinicians will be appropriately trained before using any piece of equipment, device, or technique.

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 effects, (i.e. respiratory difficulty, seizures, etc.) should be treated, as appropriate, by the applicable protocol(s).

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 clinicians on the scene may modify the ALS response as appropriate.

AMS refers to Altered Mental Status and **AMSS** refers to Altered Mental Status Scale/Score.

BIADs refers to Blind Insertion Airway Devices and include periglottic (i.e. LMA) and transglottic (i.e. King) devices.

BP in these protocols refers to the systolic blood pressure.

BSA refers to Body Surface Area and, in burn patients, can be estimated by using the Rule of 9s or patient's hand size (palm + fingers).

BVM refers to Bag-Valve-Mask ventilation

C refers to Celsius

CHF refers to Congestive Heart Failure, a condition in which patients may present with dyspnea, hypoxia, wheezing, and rales.

cm H2O refers to centimeters of water; the unit of measure for the pressure in CPAP machines; one cm H2O is the amount of additional air pressure needed to raise a column of water by one cm.

CNS refers to Central Nervous System and includes the brain and spinal cord

Definitions

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.

CPAP refers to Continuous Positive Airway Pressure

CPP refers to cerebral perfusion pressure, or the mean arterial pressure (MAP) minus the intracranial pressure (ICP). Normal CPP = 55-60 mmHg.

CVA refers to Cerebral Vascular Accident (stroke)

DL refers to direct laryngoscopy.

dL refers to deciliter

DSED refers to dual sequential external defibrillation which is the recommended treatment for refractory pulseless VT or refractory VF after the third defibrillation attempt is unsuccessful.

DNR refers to Do Not Resuscitate

DNI refers to Do Not Intubate

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.

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_2, 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
j. Dispensation of naloxone as described in **Yellow 4**

The 2018 National Scope of Practice Updates include the following procedures to the EMR scope of practice: *hemorrhage control: wound packing*, *placement of cervical collars*, *extremity splinting*, and *eye irrigation*. Maine EMS EMRs who have been trained to perform these skills, through their primary training or Maine EMS-approved continuing medical education, may perform these skills in addition to the skills listed above.

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

Definitions

End-tidal CO_2 ($ETCO_2$) 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.

ETT refers to Endotracheal Tube

F refers to Fahrenheit.

Fever refers to a temperature greater than or equal to 100.4 degrees F or 38 degrees C.

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.

g refers to gram.

GI refers to Gastro-Intestinal tract

GU refers to Genito-Urinary tract

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

IM refers to Intra-Muscular route of medication administration

IN refers to Intra-Nasal route of medication administration

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_2 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)

Additionally, the clinician 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

Definitions

IO, continued

*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 mid-line 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 **IO** push over 3-4 minutes followed by 10 mL Normal Saline flush. If pain continues, contact OLMC for OPTION of additional 20 mg slow **IO** push.
2. **Pediatric:** Consider lidocaine 2% (preservative free) 0.5 mg/kg (MAX 40 mg) slow **IO** push over 3-4 minutes followed by 10 mL Normal Saline flush. If pain continues, contact OLMC for OPTION of additional 0.25 mg/kg (MAX 20 mg) slow **IO** 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.

IV Push means an expedited method of medication delivery in which a small volume of medication is administered, all at once, over a short amount of time into a vein. Recommendations for administration times are listed in specific protocols.

kg refers to kilogram.

L refers to liter.

LVAD refers to Left Ventricular Assist Device

LVO refers to Large Vessel Occlusion, a type of stroke that may be amenable to fibrinolytic/endovascular therapy

LOC refers to Level of Consciousness

Definitions

Maine Operational Physician refers to an EMS Physician responding collaboratively with the traditional Maine EMS system, either performing or supporting prehospital care.

MAP refers to mean arterial pressure which is the diastolic pressure plus 1/3 (systolic pressure minus diastolic pressure). Post ROSC MAP goals are greater than 80 mmHg.

mCPR refers to mechanical CPR. These devices must meet the requirement of 100-120 compressions/minute with a compression depth of 2 inches.

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, a BLS clinician, an ALS clinician, the State EMS Associate Medical Director and the State EMS Medical Director.

mg refers to milligram.

ml refers to milliliter.

mmHg refers to millimeters of mercury and is the standard unit of measure for blood pressure.

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

NPA refers to nasopharyngeal airway.

NR means a non-rebreather oxygen mask.

O_2 means oxygen therapy as appropriate for patient.

OCME refers to Office of the Chief Medical Examiner

ODT refers to Orally Disintegrating Tablet, the formulation of oral ondansetron that may be administered by allowing the tablet to melt on the patient's tongue

OG refers to Oral-Gastric tube and should be considered in all intubated patients

OHCA refers to Out-of-Hospital Cardiac Arrest

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.

OPA refers to oropharyngeal airway.

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.

Definitions

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.

PCP refers to Primary Care Provider

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

PO refers to the oral route of medication administration

POLST: Provider Orders for Life-sustaining Treatment.

PPE refers to Personnel Protective equipment and includes gloves, gowns, masks, respirators, eye protection.

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.

Pulse Pressure refers to the difference between the systolic and diastolic blood pressure. A normal pulse pressure is 40-60 mmHg. A low pulse pressure may be caused by acute blood loss, cardiac tamponade, and heart failure and may be an early sign of instability in trauma patients.

RTCs refers to Regional Trauma Centers in Maine: Central Maine Medical Center (CMMC), Northern Light Eastern Maine Medical Center (EMMC), and Maine Medical Center (MMC)

Service Level Medical Director refers to a physician or nurse practitioner who has completed required clinical experience pursuant to 32 M.R.S. §2102(2-A), who assumes primary responsibility to ensure quality medical care for the service. A physician assistant may assist in this role under the direct supervision of a physician; however, the supervising physician must be identified to Maine EMS as the service's medical director.

TIA refers to Transient Ischemic Attack which presents with stroke-like symptoms

TKO refers to an IV rate of "To Keep Open" and may vary according to IV tubing (usually 10-25 mL/hour)

TOR refers to Termination of Resuscitation

Definitions

TPA(tPA) refers to Tissue Plasminogen Activator, a fibrinolytic medication used to treat non-hemorrhagic stroke

VAD refers to Ventricular Assist Device

VC refers to vector change or alternate defibrillation pad placement after a 3rd defibrillation attempt in refractory VT/VF.

VL refers to video laryngoscopy; video laryngoscopes with standard (non-hyperangulated) blades with the ability to perform both direct and video laryngoscopy are permitted for use by paramedics but must include a robust airway management education platform with service level QA/QI.

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.

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).

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 (Use of bougies on all intubation attempts with size 6.0 ETT and above is strongly encouraged)
   __ Tube-securing device ready
   __ Continuous end-tidal CO_2 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

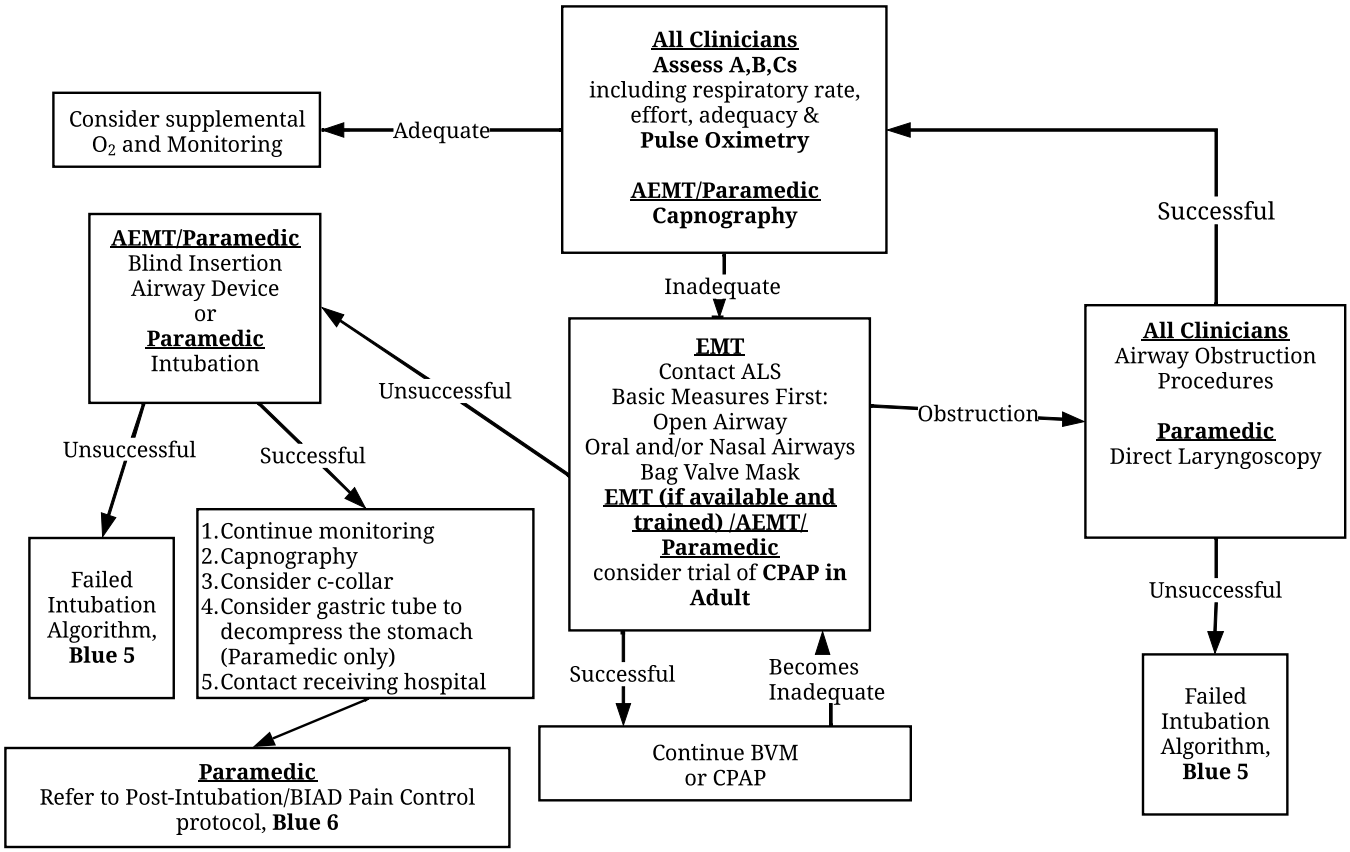
5. **Plan discussed**

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:

1) A two-person ventilation technique is used
2) $EtCO_2$ 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)

PEARLS for Endotracheal Intubation

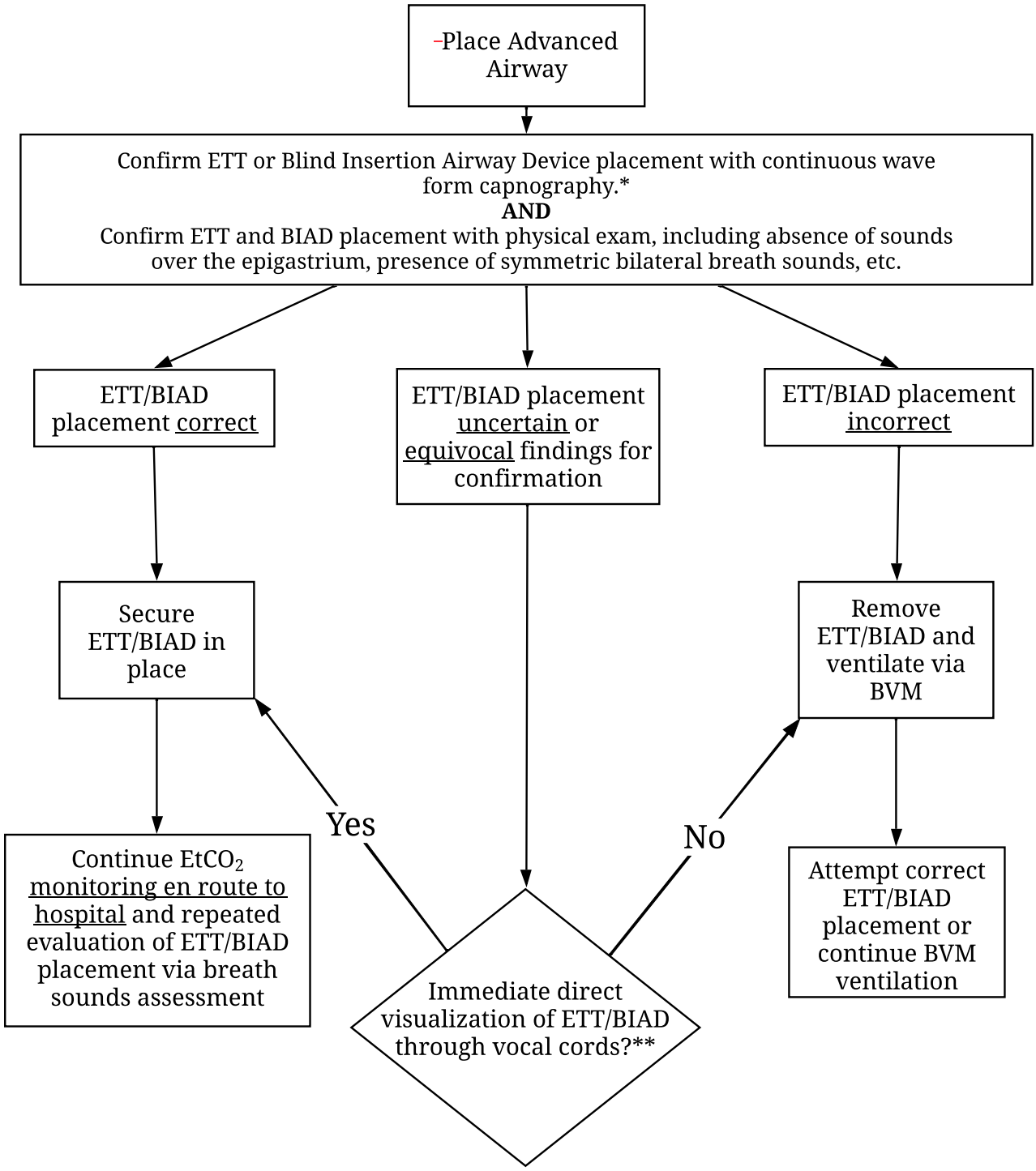
* Position the airway for best view of the cords – raise head to the sniffing position (i.e. earlobe in-line with sternal notch)
* Preparation: (four cornerstones)

1) ET tube
2) Laryngoscope with backup blade
3) Suction
4) Use of Bougie on every attempt for ETT size 6 or greater is strongly recommended

*** 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/BIAD as well as lack of pulmonary circulation in the interpretation of $EtCO_2$ findings.

** Nasotracheally-intubated patients should be assumed to have incorrect ETT/BIAD placement if findings of breath sounds or $EtCO_2$ results are uncertain or equivocal

Failed Intubation Algorithm

A "failed" intubation or the "can't intubate patient" is defined as two (2) unsuccessful intubation attempts by the most proficient technician on scene OR anatomy inconsistent with intubation attempts.

NO MORE THAN THREE (3) TOTAL ATTEMPTS PER PATIENT WITHOUT OLMC CONSULTATION.

Adequate oxygenation and ventilation with BVM?

Yes → Continue BVM → If SPO_2 drops less than 90% or it becomes difficult to ventilate with BVM

No → Facial trauma or unrelieved obstruction?

Yes → **Paramedic** Surgical airway, **Blue 13** → Ventilate, monitor for signs of adequacy including **$EtCO_2$** and **pulse oximetry** → Notify receiving hospital

No → Blind Insertion Airway Device → Notify OLMC or receiving hospital AS EARLY AS POSSIBLE regarding the patient's difficult airway

Continuous pulse oximetry and $EtCO_2$ 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 8 years old OR if physiologically young enough that surgical landmarks are NOT identifiable.

Post-Intubation/BIAD Pain Control

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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.

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EMT

1. Minimize stimulation

ADVANCED EMT

2. Place IV for anticipated medication administration.

PARAMEDIC

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

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

   a. <u>Midazolam</u>
      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 - 12 years:** 0.05 mg/kg **IV/IO,** may repeat every 5 minutes to a MAX cumulative dose of 5 mg.
         2. **6 months - 12 years:** 0.1 mg/kg **IM** (MAX single dose 5 mg), may repeat every 5 minutes to a maximum cumulative dose of 10 mg.

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-OR-

   b. <u>Ketamine</u> (**Adult ONLY**)
      i. 0.2 mg/kg **IV/IO**, max single dose of 25 mg. Mix in 100 mL bag of saline and infuse over 10 minutes via a pump. 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** 7

EMT/ADVANCED EMT

1. O_2 as appropriate.
2. If needed, assist ventilation with positive pressure ventilation using 100% O_2.
3. Request ALS. (see Definitions, **Purple 1**)
4. Ipratropium bromide 0.5 mg / albuterol sulfate 2.5 mg nebulizer if greater than one (1) year of age with continued respiratory distress. Every 5 minutes, may repeat x 2 as needed for ongoing symptoms.
5. For severe respiratory distress, EPINEPHrine:
   1. **Adult** – EPINEPHrine 0.3 mg **IM** of 1mg/1mL every 20 minutes.
   2. **Pediatric** - EPINEPHrine dose which is as follows: <u>less</u> than 25 kg, 0.15 mg **IM** [0.15 mL of 1mg/mL], <u>greater</u> than 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh every 20 minutes.
6. Consider CPAP* in patients greater than 18 y/o if no improvement after three nebulizers.

   *CPAP at the EMT level, only if available and so trained. CPAP should be initiated at 5 cm H_20 and titrated slowly (every 5 minutes), as needed. Do not exceed 10 cm H_20. 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, nebulizers *must* be administered *simultaneously**.
7. If CPAP is initiated, do the following:
   a. Ensure ALS has been requested (see Definitions, **Purple 1**). ALS clinicians bring additional therapies to support the management of patients requiring CPAP.
   b. Contact OLMC for the following treatment option:
      i. Ipratropium bromide 0.5 mg / albuterol sulfate 2.5 mg nebulizer every five minutes while the patient remains on CPAP.

ADVANCED EMT

8. Cardiac monitor
9. Manage airway as needed, refer to Airway Algorithm, **Blue 3**.

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 every five minutes x 2.

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10. Dexamethasone
    a. **Adult:**
        i. 16 mg **IV/IM/IO** x 1 **OR,**
        ii. If patient can tolerate oral medications, is not in overt respiratory distress, and is not requiring an airway management technique that obscures access to the mouth (e.g., O_2 mask or CPAP) consider 16 mg PO x 1.
    b. **Pediatric:**
        i. 0.6 mg/kg (single MAX dose of 16 mg) **IV/IM/IO** x 1 **OR**,
        ii. If patient can tolerate oral medications, is not in overt respiratory distress, and is not requiring an airway management technique that obscures access to the mouth (e.g., O_2 mask or CPAP) consider 0.6 mg/kg (single MAX dose of 16 mg) PO x 1.

11. For patients not improving with the above measures, consider the following OPTIONS:
    a. Repeated or continuous albuterol by nebulization or inhaler.
    b. For patients in status asthmaticus:
        i. Epinephrine
            1. **Adult:** EPINEPHrine 0.3 mg **IM** of 1mg/1mL every 20 minutes.
            2. **Pediatric:** EPINEPHrine dose which is as follows:
                a. Less than 25 kg, 0.15 mg **IM** [0.15mL of 1mg/mL],
                b. Greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh every 20 minutes.
        ii. Magnesium Sulfate
            1. **Adult:** Magnesium Sulfate 2 grams **IV/IO** over 15 minutes, delivered via medication pump.
            2. **Pediatric:** Magnesium Sulfate 50 mg/kg **IV/IO** with a MAX dose of 2 grams over 15 minutes delivered via medication pump.

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***Asthmatic patients**:
Airway management of asthmatic patients is primarily pharmacological, not mechanical. Therefore, the focus should be on taking those actions that enable the clinician 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 clinician must be prepared to proceed with advanced airway management.

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 steroids**. Instead, provide oxygen to ensure O_2 sats greater than or equal to 90% and nasal suctioning with bulb syringe. In patients who fail these measures, consider alternate diagnosis, including stridor/croup and refer to the Pediatric Respiratory Distress with Inspiratory Stridor protocol, **Pink 2**. Monitor for apnea or respiratory distress and, if encountered, manage the patient's airway as indicated per Airway Algorithm, **Blue 3**.

Prehospital clinicians should consider patient age, diagnosis, transport time, clinician 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

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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.

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ADVANCED EMT/PARAMEDIC

2. If CPAP causing nausea and bloating, consider ondansetron, see Nausea and Vomiting protocol, **Gold 19**.

PARAMEDIC

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

   a. <u>Midazolam</u>
      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. <u>Ketamine</u>
      i. 0.2 mg/kg **IV/IO**, MAX single dose of 25 mg. Mix in 100 mL bag of saline and infuse over 10 minutes via a pump. 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.

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Pulmonary Edema (without shock)

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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.

If initial systolic BP is less than 100 mmHg, refer to Cardiogenic Shock protocol, **Red 27.**

EMT

1. O_2 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.
5. If available, and so trained, consider trial of CPAP.

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ADVANCED EMT

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

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9. 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.

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10. Consider use of CPAP

PARAMEDIC

11. Paramedic may perform all treatments above without medical control.

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12. Contact OLMC if above measures are not working.

Pulmonary Hypertension Complications

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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.

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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.

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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.

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.

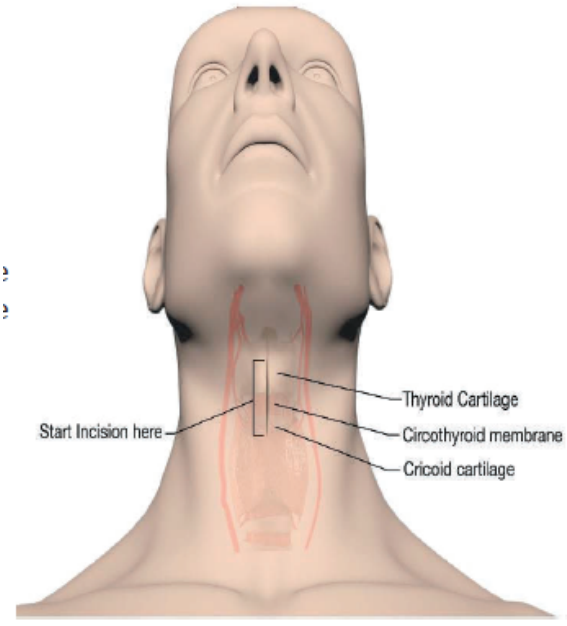
Surgical Cricothyrotomy #1

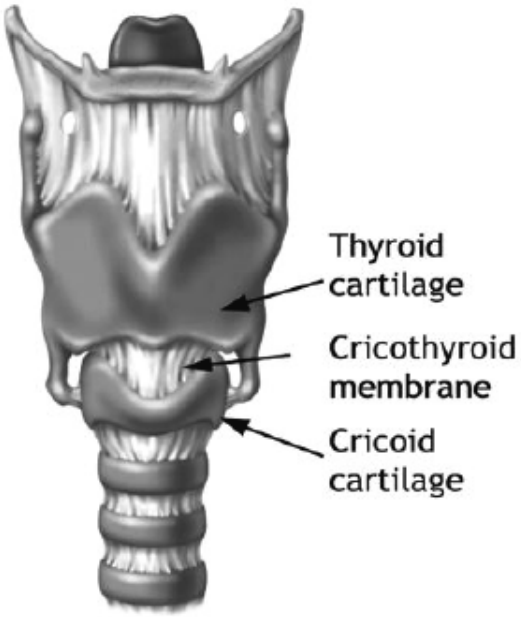
The following protocol is an effort to maintain awareness of a procedure that occurs rarely in the Maine EMS system. Ultimately, this procedure should be practiced on a regular basis to maintain proficiency. PLEASE NOTE, this protocol describes a generally acceptable open cricothyrotomy and will differ from services that employ percutaneous kits. The inclusion of this protocol DOES NOT mandate that all clinicians use this exact procedural description. Clinicians 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
5. Scalpel (No. 11 blade)
6. Umbilical tape or other means to secure tracheostomy tube or ETT
7. 4x4 gauze





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Surgical Cricothyrotomy #2

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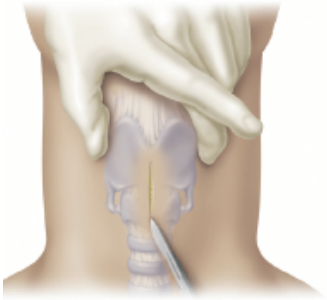
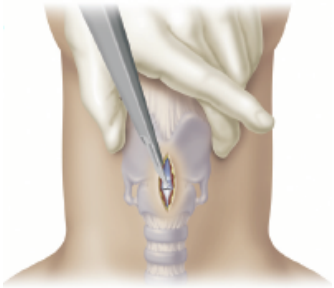
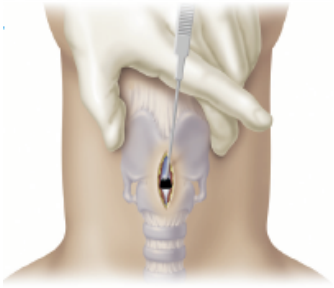
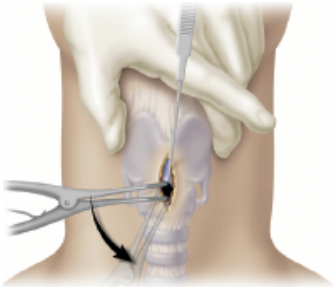
Procedure:

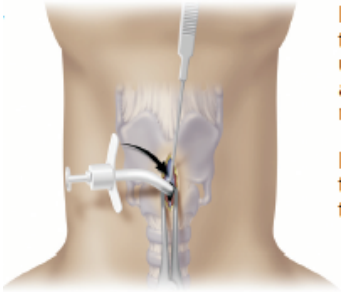
1. Extend the neck when possible to ensure best access to the trachea. Swab/cleanse the area.
2. Immobilize the trachea with your non-dominant thumb and middle finger while palpating the cricothyroid membrane with your non-dominant index finger. NOTE: The cricothyroid membrane is immediately BELOW the 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 EtCO2.
12. Secure the tube in place.
13. Dress incision site.











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Tracheostomy Care #1

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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 O2 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. Pre-oxygenate 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 1-2 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.

(Continued)

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 15 - 18,** AND, in the case of severe hemorrhage from the tracheostomy site, hyperinflate the tracheostomy cuff with 50 mL of air, 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

P

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 O_2 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.

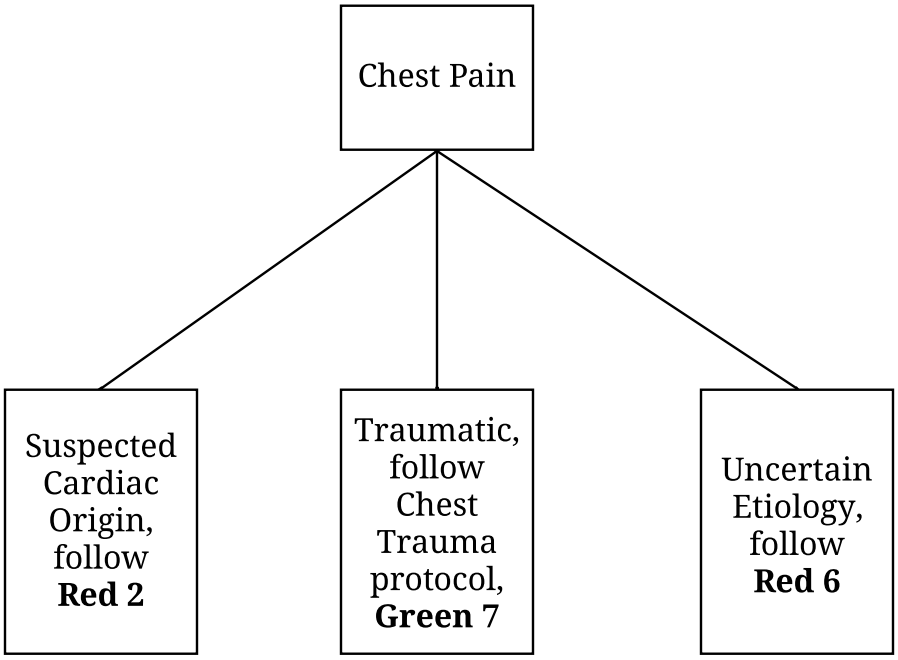
Portex Cuffed D.I.C. Tracheostomy Tubes		Shiley Tracheostomy Tubes	
Portex Tube Size (mm) and Color	Internal Diameter (mm) / ETT Equivalent	Shiley Tube Size	Internal Diameter (mm) / ETT Equivalent
3.0	3.0 / 3.0-3.5	3.0 (NEO or PED)	3.0 / 3.0-3.5
3.5	3.5 / 3.5-4.0	3.5 (NEO or PED)	3.5 / 3.5-4.0
4.0	4.0 / 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 clinicians 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 clinician 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 patients with diabetes. May also present with CHF, syncope and/or 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.
  - 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_2 to keep O_2 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. If available and so trained, perform 12-lead ECG. EMTs 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 EMT in obtaining the 12-lead ECG is to present it to the Paramedic and/or receiving facility.

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6. Contact OLMC for the OPTION of assisting with the administration of patient's own nitroglycerin

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7. Establish IV en route.
8. Cardiac monitor and 12-lead ECG within the <u>first 10 minutes</u> 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.

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9. Contact OLMC for administration of nitroglycerin 0.4 mg tab or 0.4 mg spray **SL** every 5 minutes up to 3 doses, if needed, for symptoms AND systolic BP remains above 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.

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PARAMEDIC

10. Paramedic may perform all treatments above without medical control.
11. Obtain 12-lead ECG within <u>first 10 minutes</u> 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**.
Apply defib pads and be prepared to defibrillate as these patients are high risk for VF/VT

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PARAMEDIC

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

13. 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

14. 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.

P

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

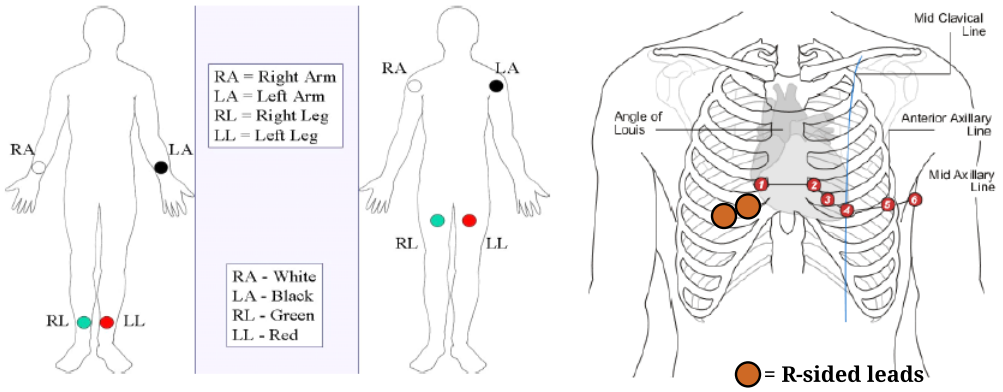
New LBBB is no longer a criteria for STEMI
(Presence of any LBBB makes the diagnosis of STEMI difficult)

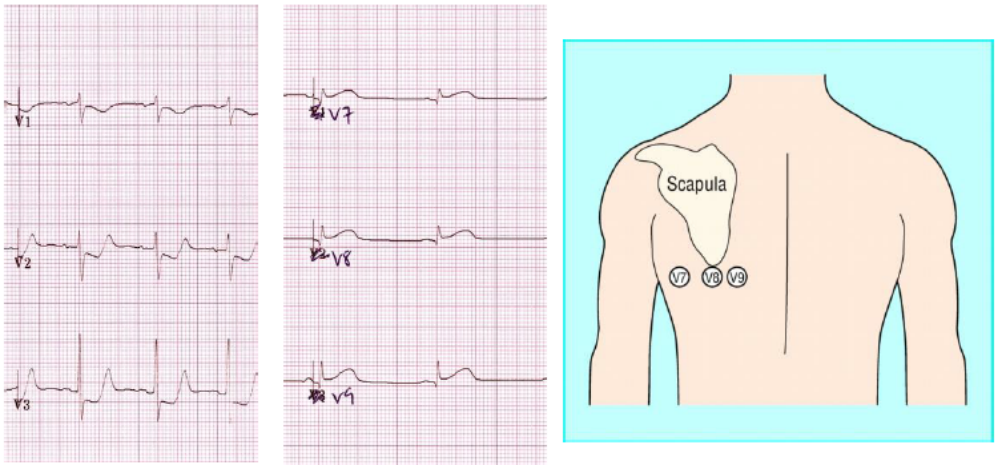
Guidelines to the Prehospital Use of 12-Lead ECG by the ALS Clinician

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 clinicians 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

*****EMT & Advanced EMT and the Use of 12-lead ECGs*****

EMTs and 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 EMT or 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 exam 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 7.**

E

EMT:

1. Administer O_2 only to patients with dyspnea, hypoxia (SpO_2 less than 94%), or signs of heart failure at a rate to keep O_2 sats greater than or equal to 94% and less than 99% (avoid hyperoxia).
2. Transport in position of comfort.
3. Request ALS.
4. If available and so trained, perform 12-lead ECG. EMTs 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 EMT in obtaining the 12-lead ECG is to present it to the Paramedic and/or receiving facility.

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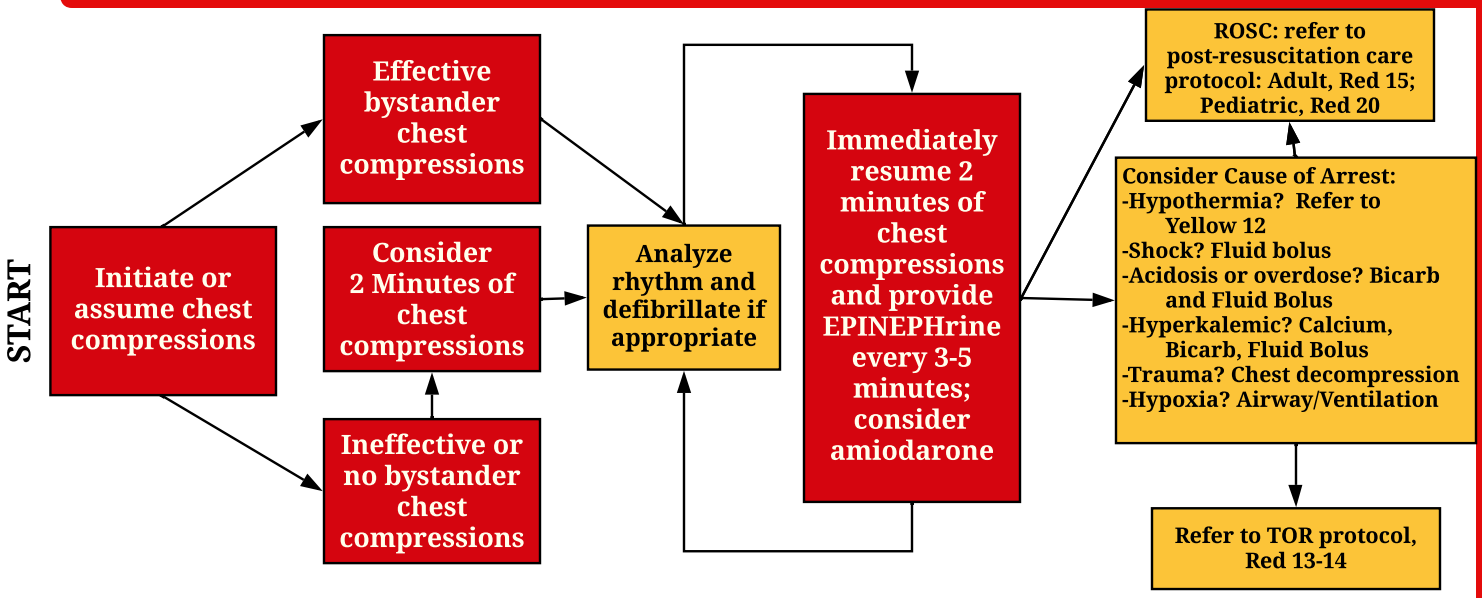
5. Establish IV at TKO.
6. Request ALS.
7. Cardiac monitor and 12-lead ECG. AEMTs are not certified to interpret the 12-lead ECG or change the ALS response based on obtaining a 12-lead ECG. The purpose of the AEMT in obtaining the 12-lead ECG is to present it to the Paramedic and/or receiving facility.

P

PARAMEDIC

8. If 12-lead ECG indicates STEMI, refer to Chest Pain-Suspected Cardiac Origin protocol, **Red 2 & 3**.
9. For chest pain in a stable patient with normal level of consciousness, refer to the Universal Pain Management protocol, **Green 18** for analgesia options.
10. For nausea and vomiting, refer to the Nausea and Vomiting protocol, **Gold 19**.

Cardiac Arrest Overview



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_2 flowing and attached to NR/BVM
	$EtCO_2$ waveform present & monitored
	IV/IO established
	Possible causes considered
	Consult OLMC **early** 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 **Hs** (**H**ypothermia, **H**ypovolemia, **H**ypoxia, **H**ypo/**H**yperkalemia, **H**+ ion or acidosis) and the 5 **Ts** (Cardiac **T**amponade, **T**ension Pneumothorax, **T**hromboembolic disease x 2 (i.e.pulmonary embolism/MI) and **T**oxins). Prior to termination of cardiac arrest, address potential causes of arrest, including effective management of patient airway, provision of fluid bolus, and consideration of sodium bicarb in possible toxic or acidotic. Also, consider sodium bicarb and calcium in suspected hyperkalemic patients. Please note, patients on dialysis are at risk for electrolyte abnormalities. Finally, consider needle decompression for tension pneumothorax if appropriate.

Adult Cardiac Arrest #1

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EMT

1. Initiate CPR until AED arrives unless valid DNR or signs incompatible with life (refer to Do Not Resuscitate Guidelines, **Grey 3)** 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_2 with BVM ventilation at a ratio of 30:2 or 1 breath every 10 chest compressions during recoil and without interrupting compressions.
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 Termination of Resuscitation protocol, **Red 13**; if cardiac arrest is due to trauma, refer to Termination of Resuscitation for Traumatic Cardiac Arrest protocol, **Green 22**.

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9. Ensure that high-performance CPR is being provided.
10. Defibrillate as indicated.
11. Establish **IV/IO** without interrupting chest compressions.
12. EPINEPHrine 1 mg of 1 mg/10 mL **IV/IO** push (within 30 seconds) every 3-5 minutes, if so trained and equipped.
13. Manage the airway per Airway Algorithm, **Blue 3**. Avoid respiratory rate greater than 10/minute in cardiac arrest.
14. Request ALS.

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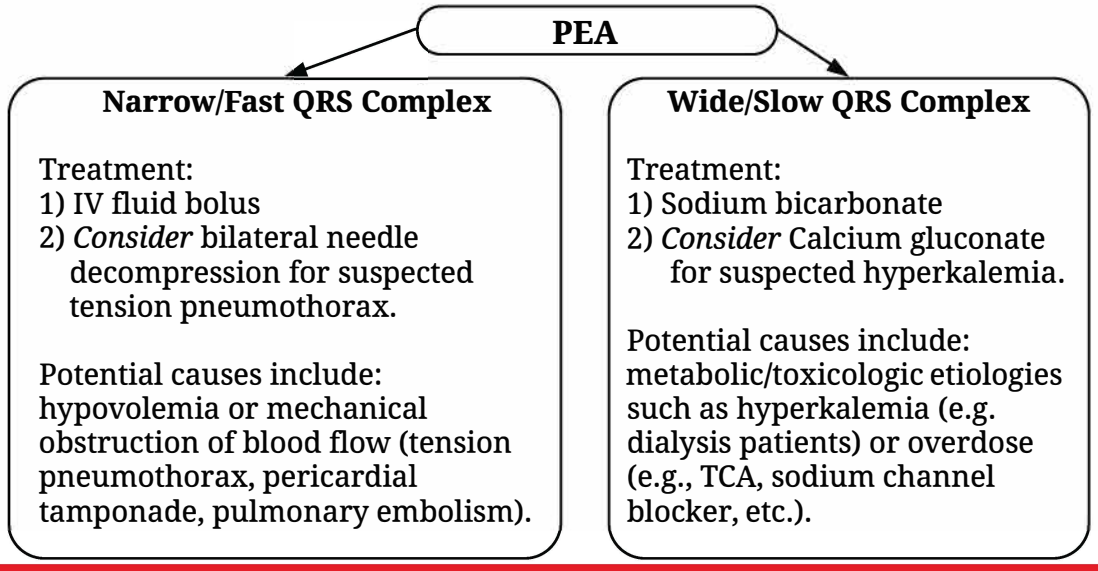
PARAMEDIC

15. One medication intervention at each 2-minute reassessment per ACLS protocol:
    a. VF/VT: amiodarone 300 mg **IV/IO**; 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 3 shocks, dose of EPINEPHrine and amiodarone), refer to Refractory VF/VT protocol, **Red 12**.
    d. For PEA, in addition to standard therapies, consider treatment based on QRS complex width and rate: narrow/fast vs wide/slow



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14. Consider causes of OHCA. Consult OLMC early for questions/advice.
    a. Is patient on dialysis, have known renal disease or suspicion for hyperkalemia?
        i. Calcium gluconate 3 gram bolus **IV/IO**
        ii. Sodium bicarbonate 50 mEq bolus **IV/IO**; may repeat x 2
        iii. IV fluid bolus
    b. Is patient suspected TCA or other suspected sodium channel blocker overdose? **(See Pearls)**
        i. Sodium bicarbonate 50 mEq bolus **IV/IO**; may repeat x 2
        ii. IV fluid bolus
    c. Is there a suspected pre-existing metabolic acidosis? **(See Pearls)**
        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 Airway Algorithm, **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 Severe Hypothermia WITHOUT signs of Life protocol, **Yellow 12**.
15. Upon ROSC:
    a. Refer to Adult Post-Resuscitation Care protocol, **Red 15**.
    b. Contact OLMC for options of:

        i. Post-resuscitation amiodarone bolus

Pearls for Cardiac Arrest:
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_2 should be used to monitor effectiveness of chest compressions. If $EtCO_2$ 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.

Pearls for Cardiac Arrest, continued:

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 clinicians to these systems of care and to regularly train clinicians 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.

IO: In OHCA patients consider humeral head placement preferentially due to proximity to central circulation.

Classes of common sodium channel blockers include the following:

- Antidepressants (amitriptyline, nortriptyline, imipramine, doxepin)
- Antiarrhythmics (quinine/quinidine, propafenone, flecainide)
- Anesthetics (cocaine, lidocaine, bupivacaine)
- Muscle Relaxants (cyclobenzaprine)
- Antihistamines (diphenhydramine)

Consider metabolic acidosis as the cause of cardiac arrest in the following clinical settings: aspirin overdose, severe diabetic ketoacidosis, severe sepsis, and excited delirium.

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 uterine displacement to either the left or right 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.

Adult Cardiac Arrest #4 (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.

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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 clinicians should be trained in High Performance CPR and Incident Command for Cardiac Arrest.
8. Mechanical CPR devices should ONLY be used by clinicians 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 clinicians 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.

Refractory VF/VT

- **Recurrent VF/VT** is defined as SUCCESSFULLY CONVERTED by standard defibrillation techniques but subsequently returns. It should NOT be treated by dual sequential defibrillation (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, the below therapies may be beneficial.

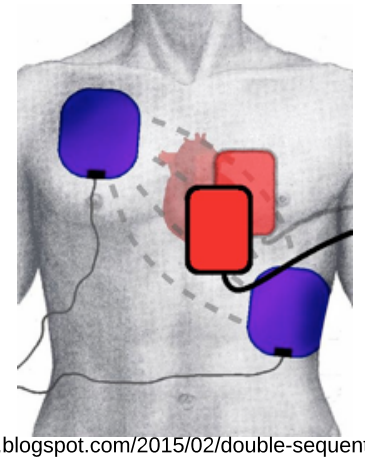
Refractory VF/VT after 3 unsuccessful shocks and administration of EPINEPHrine and amiodarone, consider the following steps:

1. Consider dual-sequential external defibrillation, if 2 defibrillators are available.
   a. This can only be performed with MANUAL defibrillators.

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

   b. Assure that controls for the second manual defibrillator are accessible to the team leader.
   c. Verify that both cardiac manual defibrillators are attached to the patient, that all pads are well-adhered, and simultaneously charge both manual defibrillators.
   d. When both defibrillators are charged to maximum energy settings and all persons are clear, push one shock button followed by the other immediately after the first shock is delivered.
   e. May repeat procedure every 2 minutes as indicated if refractory VF/VT persists, or consider vector change as noted below.

2. Vector Change: apply a second set of pads. If first set was in the anterior-apex position (blue pads in figure), place a second set in the anterior-posterior position (red pads). Do not allow the pads to touch one another.
3. Ensure adequate pad contact: i.e. pressure on pads with a barrier such as a stack of folded towels. Reassess for adequate pad contact before each defibrillation.



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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 (e.g., POLST/MOLST form, etc.), refer to the DNR Guidelines, **Grey 3**.
- Scene Safety: the physical environment is not safe for the clinician(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 Severe Hypothermia WITHOUT Signs of Life protocol, **Yellow 12**.
- When it is found that the patient has a DNR order or other actionable medical order (e.g., POLST/MOLST form, etc.), refer to the DNR Guidelines, **Grey 3**.
- When the following time frames have been met for ALS clinicians 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 clinicians arrive on scene of a patient managed by BLS clinicians, 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 clinicians 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 clinician 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.

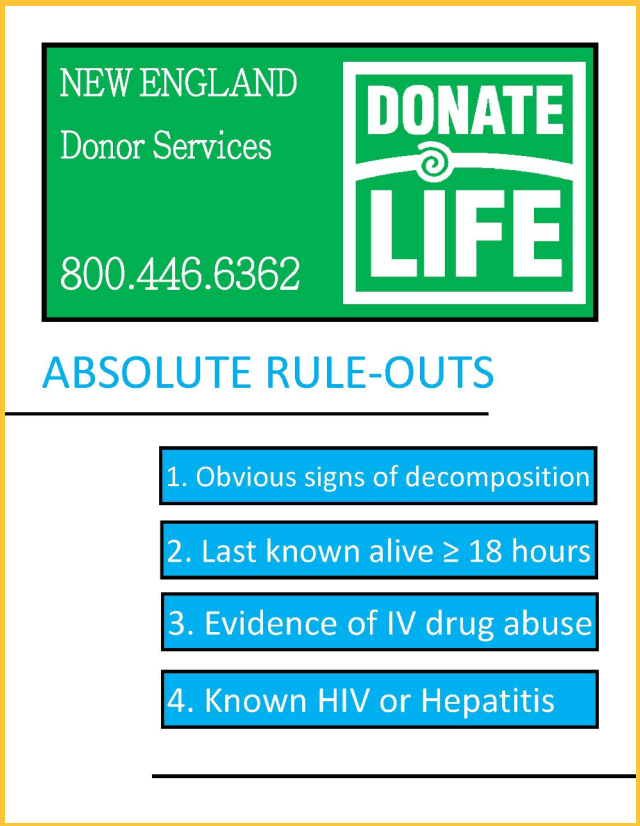
If Resuscitative Efforts are terminated:

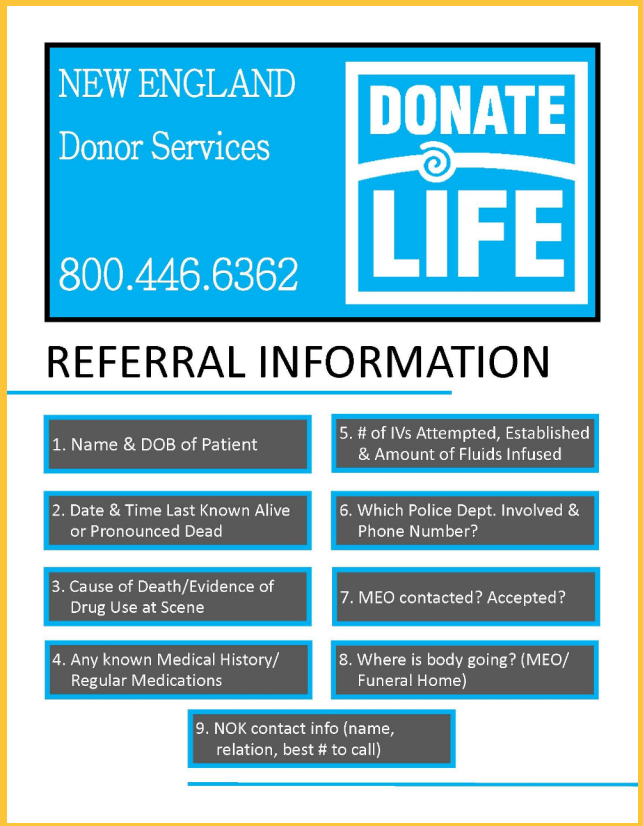
1. Focus attention on the family or bystanders. Explain the rationale for termination.
2. Consider accessing support for family: other family, friends, or social support such as clergy.
3. If termination of resuscitation occurs, one must consider management of the patient's remains. No one option is correct for all circumstances; factors on scene will likely dictate the best option. Refer to the DNR Guidelines #4, **Grey 6**. If questions remain regarding disposition of the patient's remains, contact OLMC. In the event that a patient arrests or re-arrests after leaving the scene and resuscitative efforts are unsuccessful, continue non-emergent transport to the hospital for disposition of the patient remains and family notification. This pathway should also be considered when termination of resuscitation occurs in unsafe or undesirable locations. Please discuss and pre-plan with local hospitals to ensure that all local systems are involved.

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) Notify 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.





E

EMT

1. Manage airway. Administer O_2 only to keep O_2 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.
3. Perform 12-lead ECG, if so trained.

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4. Provide advanced airway management if indicated and initiate capnography. Avoid excessive ventilation. Aim for ventilation rate between 10-12 breaths per minute.
5. 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.
6. Perform 12-lead ECG.

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Goal #1 - 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.

Goal #2 - Identify STEMI

8. If evidence of STEMI on 12-lead ECG, refer to Chest Pain-Suspected Cardiac Origin protocol, **Red 2** and follow local STEMI referral patterns.

9. If hypotension persists:
   a. NOREPInephrine **IV infusion**. NOREPInephrine infusions must be administered via a Maine EMS approved medication pump.
      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.
      iii. **Titrate** to maintain SBP greater than 100 mmHg.

10. If seizure develops, refer to Seizure protocol, **Gold 8**.

11. If patient suffers loss of spontaneous circulation and re-arrests, refer to appropriate protocol.

Adult Post-Resuscitation Care Checklist

SAVE A LIFE	
S	**S**tabilize - Stay on scene vs. rapid departure
A	**A**irway - if still unresponsive, establish a definitive airway (SGA, ETT)
V	**V**itals - change frequency to every 3 minutes **V**asopressors (NOREPInephrine)- focus on cerebral perfusion pressure, goal is MAP greater than 80 mmHg
E	**E**tCO2 - monitor airway and for re-arrest
A	**A**lert/activate hospital
L	**L**eave/**L**oad in ambulance with mechanical CPR device in place, if available in case patient rearrests en route to hospital
I	**I**V - if only an IO has been placed
F	**F**ollow-up vital signs to ensure stability before departure
E	**E**CG - may affect destination, delayed ECG increases accuracy

Pediatric Cardiac Arrest #1

If patient less than 29 days old, see Neonatal Resuscitation protocol, **Pink** 7.

EMT

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1. Initiate immediate CPR with minimal interruptions, continue CPR until AED arrives or signs incompatible with life are present, refer to Do Not Resuscitate Guidelines, **Grey 3**; 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. From birth to 8 years, use pediatric AED pads. If pediatric pads are unavailable, use adult AED pads, do not allow pads to overlap.
3. Place oral and/or nasal airway(s).
4. High-flow O_2 with BVM ventilation at a ratio of 30:2 or 15:2 if multiple rescuers.
5. Request ALS.
6. Continue 2-minute cycles of chest compressions and AED checks.
7. If ROSC occurs, refer to Pediatric Post-Resuscitation Care protocol, **Red 20**.
8. Consider termination of resuscitation after discussion with OLMC ; refer to Termination of Resuscitation protocol, **Red 13**.

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9. Establish **IV/IO** without interrupting chest compressions.
10. Manage the airway per Airway Algorithm, **Blue 3**. If BVM ventilation is inadequate, consider placement of supraglottic airway (BIAD).
11. Establish weight in kg using length-based tape, see Pediatric Specific Equipment Sizes protocol, **Pink 10** for suggested equipment size, if needed.
12. Continue 2-minute cycles of chest compressions.
13. For Ventricular Fibrillation (VF)/Pulseless Ventricular Tachycardia (VT):
    a. Initial defibrillation at 2 J/kg; perform CPR for 2 minutes and recheck rhythm; if still a shockable rhythm, defibrillation at 4 J/kg; perform CPR and reassess every 2 minutes. Continue 2 minute cycles of CPR with defibrillation as indicated. Third defibrillation at 6 J/kg, fourth at 8 J/kg, fifth and subsequent defibrillations at 10 J/kg.
14. Administer NS 20 mL/kg fluid bolus **IV/IO**. May repeat x 1 at 5 minutes after initial bolus. If pre-existing cardiac history, consider reducing to 10 mL/kg for each bolus.
15. Check blood glucose if resources are adequate and doing so would not interfere with CPR. If blood glucose is < 60 mg/dL, treat with 5 mL/kg of $D_{10}W$.

PARAMEDIC

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16. If BVM ventilation is inadequate, consider placement of advanced airway. In most cases, BIADs are preferable due to their ease of placement. See Pediatric Specific Equipment Sizes protocol, **Pink 10** for suggested equipment size.
17. One medication intervention at each 2-minute reassessment per PALS protocol.
18. Defibrillate as indicated.
    a. If no response after first defibrillation, administer 0.01 mg/kg (0.1 mL/kg) EPINEPHrine of 1 mg/10 mL **IV/IO** rapid push, **MAX** single dose 1 mg.
       i. Repeat every 3-5 minutes
    b. If no response after second defibrillation, consider:
       i. Amiodarone 5 mg/kg bolus **IV/IO**. MAX single dose of 300 mg. Can repeat in 3-5 minutes up to a total dose of 15 mg/kg.
       ii. Torsades: Magnesium sulfate 25-50 mg/kg **IV/IO** over 1-2 minutes. MAX single dose 2 grams.

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19. For Asystole or Pulseless Electrical Activity:
    a. Administer 0.01 mg/kg (0.1 mL/kg) EPINEPHrine (1 mg/10mL) **IV/IO** rapid push, MAX single dose 1 mg.
        i. Repeat every 3-5 minutes.
    b. Perform 2 minutes of CPR, then check rhythm. If asystole/PEA, continue EPINEPHrine and 2 minutes of CPR until:
        1. Pulse obtained, OR
        2. Shockable rhythm obtained, OR
        3. Decision made to discontinue further efforts, refer to Termination of Resuscitation protocol, **Red 13**.
20. Consider causes of OHCA. Consult OLMC early for questions/advice.
    a. For hypoxia, administer high-flow oxygen and manage airway per Airway Algorithm, **Blue 3**.
    b. If hypovolemia is suspected, give fluid bolus of 20 mL/kg **IV/IO**. May repeat x 1 at 5 minutes after initial bolus. If pre-existing cardiac history, consider reducing to 10 mL/kg for each bolus.
    c. For suspected pre-arrest metabolic acidosis, suspected or known hyperkalemia (dialysis patient), or known TCA overdose, consider:
        i. Sodium bicarbonate 1 mEq/kg bolus **IV/IO,** MAX single dose 50 mEq. Do not mix with any resuscitation drugs. Flush IV tubing with NS before and after drug administration. For TCA overdose, repeat every 5 minutes until QRS duration is less than 120 msec. **Do not use routinely in cardiac arrest**. (8.4% sodium bicarbonate must be diluted 1:1 with D_5W to 4.2% [0.5 mEq/mL] prior to administration in patients less than 2 years of age).
    d. If patient's core temperature less than 30°C (86°F) and circumstances consistent with hypothermia, see Severe Hypothermia WITHOUT Signs of Life protocol, **Yellow 12**.
    e. For known or suspected hyperkalemia or symptomatic calcium channel blocker/beta-blocker overdose, consider:
        ii. Calcium gluconate 60 mg/kg bolus **IV/IO** over 1 minute; MAX single dose of 3 grams; may repeat in 10 minutes. **Do not use routinely in cardiac arrest.**
    f. Perform needle decompression if there is a suspected pneumothorax.
21. Upon ROSC:
    a. Refer to Pediatric Post-Resuscitation Care protocol, **Red 20**.

Pearls for Pediatric Cardiac Arrest

- **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.**
- **Consider foreign body airway obstruction given history and age of the patient.**
- **Do not use mechanical CPR devices in patients under 18 years old.**

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Pediatric Cardiac Arrest #3

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- **Despite excellent efforts, survival rates from pediatric cardiac arrest remains very low. Unsuccessful resuscitation of a pediatric patient suffering OHCA is traumatic to surviving family members and loved ones. Please consider establishing on-scene support for survivors. If no on-scene support is available, consider discussing with OLMC to determine if the local hospital may have additional resources for the family. In addition, these events are acutely traumatic to responding EMS clinicians. Please ensure all responding personnel are provided necessary resources to maintain resilience in the face of an unsuccessful resuscitation.**

Pediatric Post-Resuscitation Care

E

EMT

1. Manage airway per Airway Algorithm, **Blue 3**.
2. Optimize ventilation and oxygenation:
   a. Initial ventilation rate of 12-20 breaths/min.
   b. Administer oxygen as appropriate with target of achieving 94-99% saturation (avoid hypo-/hyperoxia).
3. Request ALS.
4. Perform 12-lead ECG, if so trained and doing so would not delay transport.

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5. Titrate waveform capnography to 35-45 mmHg.
6. Obtain IV/IO access and treat hypotension with fluid boluses (20 mL/kg NS) to maintain systolic blood pressure of 70 mmHg + (2 x age); may repeat to a MAX of 60 mL/kg. Consider 10 ml/kg fluid boluses if the patient has pre-existing cardiac disease.

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PARAMEDIC

Goal #1 - Aggressive management of hypotension

7. If hypotension persists after fluid boluses:
   a. NOREPInephrine **IV infusion**:
      i. **Preparation** - mix NOREPInephrine 8 mg in 250 mL NS
      ii. **Dosing** - infusion 0.1 - 2 mcg/kg/min (MAX dose of 30 mcg/min) titrated to effect
      iii. NOREPInephrine infusions must be administered via a Maine EMS-approved medication pump
8. If seizure develops, refer to Seizure protocol, **Gold 8**.
9. If patient suffers loss of spontaneous circulation and re-arrests, refer to appropriate protocol.

Pediatric Cardiac Medications & Dosages

Prehospital clinicians should consider patient age, diagnosis, transport time, clinician 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 (Indication: Bradycardia)	**IV/IO**: 0.02 mg/kg Minimum dose: 0.1 mg MAX single dose: 0.5 mg (child) May repeat once
EPINEPHrine 1 mg/10 mL (Indication: Bradycardia)	**IV/IO**: 0.01 mg/kg (0.1 mL/kg) MAX single dose: 1 mg
EPINEPHrine 1 mg/10 mL (Indication: Pulseless Arrest)	**IV/IO**: 0.01 mg/kg (0.1 mL/kg) MAX single dose: 1 mg Repeat every 3-5 minutes
Amiodarone (Indication: VF/VT)	**IV/IO:** 5 mg/kg bolus MAX single dose: 300 mg Can repeat in 3-5 minutes up to total dose of 15 mg/kg.
Sodium Bicarbonate (Indications: wide complex PEA suggesting hyperkalemia or sodium channel blocker overdose) Common sodium channel blockers include: tegretol, carbamazepine, TCAs, propranolol, and flecanide	**IV/IO**: 1 to 2 mEq/kg bolus MAX single dose: 50 mEq Repeat every 5 minutes until QRS duration is less than 120 msec 8.4% sodium bicarbonate must be diluted 1:1 with D_5W to 4.2% [0.5 mEq/mL] prior to administration in patients less than 2 years of age
Magnesium (Indication: Torsades de Pointes, moderate/severe asthma)	**IV/IO**: 25-50 mg/kg MAX single dose: 2 grams
Calcium Gluconate (Indication: Cardiac Arrest Suspected due to Hyperkalemia)	**IV/IO:** 60 mg/kg push over 1 minute MAX single dose: 3 grams Repeat in 10 minutes

Synchronized Cardioversion: 0.5 - 1.0 J/kg (initial); 2 J/kg (subsequent)
Defibrillation: 2 J/kg (initial); 4 J/kg ; 6 J/kg; 8 J/kg, 10 J/kg (maximum)

Tachycardia #1

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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.

In the stable patient, a heart rate of less than 180 in children and less than 220 in infants is probable sinus tachycardia if p-waves are present and normal in appearance. Consultation with OLMC is encouraged if there is uncertainty.

EMT

1. Airway management per Airway Algorithm, **Blue 3**.
2. Request ALS.
3. Perform 12-lead ECG, if so trained.

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4. Establish IV/IO.
5. Cardiac monitor, perform 12-lead ECG.
6. Request ALS.

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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:

7. 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. **PEDIATRIC** Synchronized Cardioversion for all rhythms, per **Grey 26**, initial cardioversion at 0.5 - 1.0 J/kg. All subsequent cardioversions at 2.0 J/kg.

   e. Consider premedication as follows:
      i. **Adult**: Midazolam 3 mg **IV/IN/IO** OR fentanyl 1 mcg/kg **IV/IN/IO** to a MAX first dose of 100 mcg.
      ii. **Pediatric**: Midazolam 0.05 mg/kg **IV/IO** or 0.1 mg/kg **IN** (MAX dose 3 mg) OR fentanyl 1 mcg/kg **IV/IN/IO** to a MAX first dose of 100 mcg.

   f. If unable to synchronize, or in the case of patient instability or polymorphic VT,
      i. **Adult**: defibrillate x 1 at 200J or monophasic equivalent.
      ii. **Pediatric**: defibrillate at 2 J/kg with up to a max of 10 J/kg.

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8. 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
9. Contact OLMC for further options, including amiodarone drip (for wide complex tachycardia).

If hemodynamically STABLE:

10. **Narrow complex** tachycardia (due to rhythms other than sinus tachycardia):
    a. Modified Valsalva maneuver - Position patient seated upright and have patient blow into a 10 mL syringe forcefully, attempting to move the plunger for 15 seconds. Then, immediately lay the patient supine and raise legs to 45 degrees. Hold legs for 1 min, then return to seated position. Reassess. May repeat once.

Position patient seated upright and have patient blow into a 10 mL syringe forcefully, attempting to move the plunger for 15 sec. *

Then, immediately lay the patient supine and raise legs to 45 degrees. Hold legs for 1 min, then return to seated position.*

    b. Adenosine:
       i. **Adult:** Adenosine 6 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush
          1. May repeat adenosine x 2 at 12 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush.
       ii. **Pediatric < 50 kg:** Adenosine 0.1 mg/kg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush.
          1. May repeat adenosine x 1 at 0.2 mg/kg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush.

* Photos courtesy of Appelboam A et al. *Postural Modification to the Standard Valsalva Manoeuvre for Emergency Treatment of Supraventricular Tachycardias (REVERT): A Randomized Controlled Trial.* Lancet 2015. [epub ahead of print]PMID: 26314489. Supplemental material accessed on 6-1-2021

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11. **Wide complex** tachycardia

****Only for **REGULAR** rhythm with MONOmorphic QRS (see PEARL)****

a. **Adult**: Adenosine 6 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush.
   i. May repeat adenosine x 2 at 12 mg **IV** rapid bolus at centrally located peripheral IV with rapid saline flush.
   ii. Consider amiodarone 150 mg **IV/IO** in 100 mL D_5W over 10 minutes.

b. **Pediatric:** Adenosine 0.1 mg/kg (MAX dose of 6 mg) **IV** rapid bolus at centrally located peripheral IV with rapid saline flush.

   i. May repeat adenosine x 1 at 0.2 mg/kg (MAX dose of 12 mg) **IV** rapid bolus at centrally located peripheral IV with rapid saline flush.

12. **For POLYmorphic wide complex tachycardia (Torsades de Pointes):**

a. **Adult:** Magnesium sulfate 1-2 grams **IV/IO** over 5 minutes
b. **Pediatric**: Magnesium sulfate 25-50 mg/kg **IV/IO** (MAX single dose 2 grams)

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

EAP

Adults are considered bradycardic if HR is less than 50 beats/minute.
Pediatric patients are considered bradycardic if HR is less than 60 beats/min despite adequate oxygenation and ventilation.

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_2 as appropriate.
2. Advanced EMT/Paramedic ONLY – consider fluid bolus.

If ANY concerning signs or symptoms, then:

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EMT

1. O_2 as appropriate.
2. Request ALS.
3. **Pediatrics**: initiate chest compressions for patients with a HR less than 60 beats per minute despite adequate oxygenation and ventilation.
4. Perform 12-lead ECG, if so trained.

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5. IV en route and fluid bolus as required.
6. Cardiac monitor, perform 12-lead ECG, if so trained.
7. Request ALS.

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PARAMEDIC

8. **Adult**: Atropine 1 mg **IV/IO***; give in repeat doses every 3 - 5 minutes up to a maximum cumulative dose of 3 mg in the adult patient.
9. **Pediatric**: If no response to oxygenation, ventilation and chest compressions:
   a. EPINEPHrine [1 mg/10mL] 0.01 mg/kg (0.1 mL/kg) **IV/IO**, MAX single dose 1 mg. Repeat every 3-5 minutes.
   b. In addition, consider Atropine* for increased vagal tone or primary AV Block Atropine* 0.02 mg/kg **IV/IO**. May repeat x 1. Minimum dose 0.1 mg and MAX single dose 0.5 mg.
10. **Adult & Pediatrics:** 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.
    a. Consider premedicating with:
       i. **Adult**: Midazolam 3 mg **IV/IN/IO** OR fentanyl 1 mcg/kg **IV/IN/IO** to a MAX first dose of 100 mcg.
       ii. **Pediatric**: Midazolam 0.05 mg/kg **IV/IO** or 0.1 mg/kg **IN** (MAX dose 3 mg) OR fentanyl 1 mcg/kg **IV/IN/IO** to a MAX first dose of 100 mcg.
    b. Contact OLMC as soon as possible
11. Check for capture frequently (every 2 minutes) by checking peripheral pulses, ensuring the pulse matches the paced rate.

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Bradycardia #2

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PARAMEDIC

12. If continued signs or symptoms, consider:
    a. Repeat atropine, or
    b. EPINEPHrine **IV infusion**, which may typically be dosed the following way:
        i. 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.
        ii. **Dose** - Start at 0.05 mcg/kg/min. Titrate by 0.05 mcg/kg/min every 5 min. Titrate to desired 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

PEARLS

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

- Examples of circumstances leading to increased vagal tone include the following: cholinergic medications (phenylephrine, neostigmine), sedatives (morphine) and nasopharangeal or esophageal stimulation (eg. due to gastric reflux, breath holding, vomiting, coughing, intubation, placement of nasopharangeal tube, suctioning, etc.)

- **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 2nd degree Type II, or 3rd degree AV Block

- Consider anterior-posterior placement favorable to anterior-apex placement

- **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.

- **Bradycardia in the Post-Arrest Patient:** Post-ROSC bradycardia is a peri-arrest state. For the patient who has achieved ROSC and becomes bradycardic, be very cautious. Typically, these causes do not respond durably to transcutaneous pacing alone. In addition to transcutaneous pacing, consider early initiation of NOREPInephrine and refer to the post arrest protocol. Check mechanical capture every 2 minutes and restart CPR if no pulse is detected.

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EMT

1. O_2 as appropriate.
2. Request ALS.
3. If available and so trained, perform 12 lead ECG. EMTs 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 EMT in obtaining the 12-lead ECG is to present it to the Paramedic and/or receiving facility.

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4. Cardiac monitor, obtain 12-lead ECG
5. Establish IV en route.
6. Request ALS.

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

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PARAMEDIC

8. NOREPInephrine **IV infusion**:
   a. Preparation – mix NOREPInephrine 8 mg in 250 mL NS.
   b. 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
   c. Titrate to maintain systolic BP greater than 100 mmHg
   d. NOREPInephrine infusions in adults and pediatrics must be administered via a Maine EMS-approved medication pump

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.
- Pediatric patients rarely require vasopressors. If the patient is not responding to or tolerating intravenous fluids, consult OLMC.

Syncope

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EMT

1. Obtain history (seizure, stroke, fluid loss, palpitations, chest pain, dizzy, trauma) and consider spinal immobilization if appropriate.
2. O_2 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 the Allergy/Anaphylaxis protocol, **Gold 1**.
   b. Cardiogenic, refer to the Cardiogenic Shock protocol, **Red 27**.
   c. Tension Pneumothorax, refer to the Chest Trauma protocol, **Green** 7.
   d. Medical Shock, refer to the Medical Shock protocol, **Gold 14**.
5. Request ALS.
6. Obtain a 12-lead ECG, if so trained.

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

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.
- Up to one third of syncope in adults older than 60 is caused by cardiac disorders.
- 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 SYNCOPE.

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

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. For VAD-related complaints, consider early consult with the patient's VAD support team, including the following individuals in the following order:
   a. The patient's VAD coordinator,
   b. The patient's VAD physician,
   c. Other members of the VAD team, or
   d. OLMC at the patient's VAD hospital.
2. 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.
3. 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.
4. 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.

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   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.

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Ventricular Assist Devices #2

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5. 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.
6. Manage the patient's airway as indicated by the Airway Algorithm, **Blue 3**.
7. Establish IV/IO access based on the patient's acuity and clinician judgment.
8. Place the patient on a cardiac monitor.
9. Perform 12-lead ECG.

PEARLS for VADs

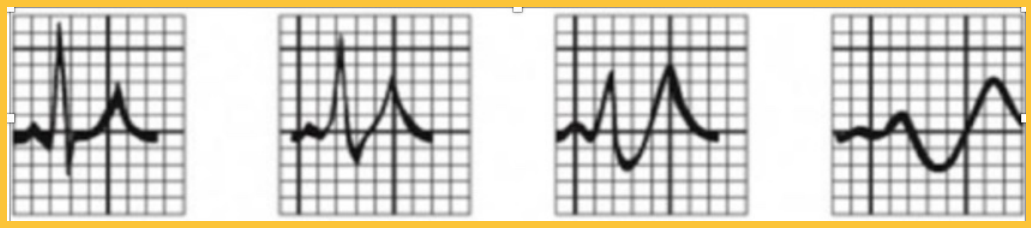
- You do not need to disconnect the controller or batteries in order to defibrillate or cardiovert.
- You do not need to disconnect the controller or batteries in order to acquire a 12-lead ECG.
- Automatic non-invasive cuff blood pressures may be difficult to obtain due to the narrow pulse pressure 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).

Hyperkalemia #1

Hyperkalemia (elevated serum potassium levels) can become a life-threatening electrolyte disturbance which causes changes in the electrical system of the heart potentially leading to fatal arrhythmias. While serum electrolyte values are not routinely available in the prehospital setting, a paramedic can identify the electrical changes on ECG and initiate prompt treatment.

Patients at highest risk of cardiac consequences of hyperkalemia are those in renal failure: either end stage kidney disease requiring dialysis or with acute decompensations in renal function. The most common at-risk patient is the dialysis dependent patient who has missed one or more scheduled dialysis sessions and thus has accumulated dangerously high levels of electrolytes, including potassium. There are also a number of prescription medications that can alter serum potassium levels such as diuretics, blood pressure medications, chemotherapy agents, and more.

Electrocardiographic signs of hyperkalemia include the following:



Peaked T-Wave (tall and symmetric)

Widened QRS

Widened QRS and lengthened QT interval

P

1. Obtain 12-lead ECG and evaluate for signs of hyperkalemia, including peaked T waves, widened QRS, lengthened QT interval, loss of P waves.
2. Perform continuous cardiac monitoring.
3. Establish 2 points of IV/IO access.
4. If ECG changes suggestive of hyperkalemia are noted, administer:
   a. **IV/IO** fluid bolus: 500 - 1000 mL (NS or LR)
   b. Calcium gluconate - **NOTE**: DO NOT administer Calcium through same IV/IO as Sodium Bicarbonate
      i. **Adult**: 2 grams diluted in 50-100 mL NS or D_5W **IV/IO** over 10 minutes
      ii. **Pediatric**: 60mg/kg diluted in 50-100 mL NS or D_5W (with MAX dose of 2 grams) **IV/IO** over 10 minutes
   c. Sodium bicarbonate - **NOTE**: DO NOT administer Sodium bicarbonate through same IV/IO as Calcium
      i. **Adult**: 50mEq **IV/IO**
      ii. **Pediatric**: 1mEq/kg **IV/IO** over 5 minutes with MAX dose of 50mEq (8.4% sodium bicarbonate must be diluted with D_5W to 4.2% [0.5 mEq/mL] prior to administration in patients less than 2 years of age.)
   d. Albuterol
      i. **Adult**: 15 mg via nebulizer
      ii. **Pediatric**:
         1. Pediatric less than 25 kg: 2.5 mg via nebulizer
         2. Pediatric greater than 25 kg: 5 mg via nebulizer
5. Repeat 12-lead ECG after treatment to evaluate for improvement.
6. Consult OLMC with questions or to discuss repeat doses if ECG not improved.

(Continued)

Hyperkalemia #2

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7. **Note:** If patient progresses to cardiac arrest, give the following early in your resuscitation efforts (Refer to Adult Cardiac Arrest #2 protocol, **Red 9** or Pediatric Cardiac Arrest #2 protocol, **Red 18**):
   a. Calcium gluconate:
      i. **Adult**: 3 gram **IV/IO push** over 1 minute, may repeat in 10 minutes.
      ii. **Pediatric**: 60 mg/kg **IV/IO push** over 1 minute, max dose 3000 mg, may repeat in 10 minutes.

   b. Sodium bicarbonate:
      i. **Adult**: 50 mEq **IV/IO push** over 1-2 minutes, repeat every 5 minutes until QRS duration less than 120 msec.
      ii. **Pediatric**: 1 to 2 mEq/kg **IV/IO push** over 1-2 minutes, MAX single dose: 50 mEq, repeat every 5 minutes until QRS duration less than 120 msec. (8.4% sodium bicarbonate must be diluted 1:1 with D_5W to 4.2% [0.5 mEq/L] prior to administration in patients less than 2 years of age.)

   c. Fluid bolus

PEARLS for Hyperkalemia:

- Higher serum potassium levels (reported as K+) may not directly correlate with higher risk for cardiac instability, any elevation in serum potassium can increase risk of cardiac instability.
- Hyperkalemia should ONLY be treated if ECG changes are present. Patients presenting with elevated serum potassium levels based on outpatient/hospital lab testing do not warrant treatment unless ECG changes are present. If elevated serum potassium levels are noted on laboratory testing, obtain 12-lead ECG and perform continuous cardiac monitoring to evaluate for electrical changes.
- These can be dynamic situations. Monitor QRS complexes closely after therapy. If initial improvement, but recurrence of QRS changes, please re-initiate protocol.
- The treatment of hyperkalemia is based on several mechanisms:
  - Dilution: dilution of the serum potassium with fluid bolus
  - Cardiac stabilization: Calcium gluconate stabilizes the electrical conduction system of the heart, making it less susceptible to electrolyte disturbance
  - Potassium shift: albuterol and sodium bicarbonate can temporarily shift potassium ions from the serum into cells, thus reducing the serum potassium level. The half-life of albuterol is short, but may temporarily improve serum potassium levels while the other treatments take effect.

Allergy/Anaphylaxis #1

E

EMT

1. Manage airway as appropriate, see Airway Algorithm, **Blue 3**
2. If shock present, refer to Medical Shock protocol, **Gold 14**
3. If anaphylaxis is 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 1 mg/mL] in anterolateral thigh, or
   b. **Pediatric** dose of EPINEPHrine which is as follows: less than 25 kg, 0.15 mg **IM** [0.15 mL of 1 mg/mL], greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1 mg/mL] in anterolateral thigh

   c. Repeat **IM** EPINEPHrine doses every 5 min, as needed*
   d. Notify OLMC of incoming critical patient.

4. Request ALS, if available
5. If wheezing persists 5 minutes after first dose of EPINEPHrine, refer to Respiratory Distress with Bronchospasm protocol, **Blue 7**, for administration of ipratropium bromide/albuterol.
6. Consider local measures to prevent absorption of allergen

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7. If anaphylaxis identified:
   a. **Adult**: EPINEPHrine 0.3 mg IM [0.3 mL of 1 mg/mL] in anterolateral thigh, or
   b. **Pediatric** dose of EPINEPHrine which is as follows: less than 25 kg, 0.15 mg **IM** [0.15 mL of 1 mg/mL], greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1 mg/mL] **IM** in anterolateral thigh

   c. Repeat **IM** EPINEPHrine doses every 5 min, as needed.
   d. If patient requires repeated EPINEPHrine, request ALS.
8. IV en route
9. Cardiac monitor
10. If shock present, administer fluid bolus
11. 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.

P

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; repeat every 5 minutes, as needed
    a. Albuterol 2.5 mg by nebulization;
    b. 1 mL of 1 mg/mL EPINEPHrine nebulized with 2 mL of NS
    c. 0.5 mL of 2.25% racemic EPINEPHrine solution nebulized with 2.5 mL NS

(Continued)

Allergy/Anaphylaxis #2

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15. Repeat **IM** EPINEPHrine every 5 minutes, as needed.
16. If patient suffers hemodynamic collapse OR does not improve OR worsens after 3 doses of **IM** EPINEPHrine, initiate EPINEPHrine **IV** infusion: **

    Preparation - Add 1 mL (1 mg) EPINEPHrine 1 mg/mL to 250 mL bag NS or D_5W. 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, SBP 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 administered via a Maine EMS-approved medication pump.

PEARLS for Allergy/Anaphylaxis

***IM** EPINEPHrine is the foundation of anaphylaxis treatment and should be administered every 5 minutes with nebulizers in between.

**Patients suffering from shock secondary to anaphylaxis are very ill and the care of these patients may be nuanced. Please consider the value of OLMC discussion for any questions or concerns regarding the management of these patients.

Children with a known, recent exposure to common triggers of allergic reactions (e.g., 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 (i.e. Allergic reaction only). Only patients with anaphylaxis (as defined in **Gold 3**) should receive EPINEPHrine. Evidence suggests that the incidence of anaphylaxis is under recognized. Please consider the definitions of anaphylaxis (on the following page) and treat all cases of anaphylaxis with EPINEPHrine.

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

Allergy/Anaphylaxis #3

Anaphylaxis is highly likely when EITHER of the following criteria are met:

1. **Acute onset of illness (minutes to hours) with skin or mucosal involvement* AND either of the following:**
   a. Respiratory compromise**
   b. Hypotension or evidence of end-organ dysfunction***

2. **Acute onset of illness (minutes to hours) after exposure to a likely allergen AND any two of the following:**
   a. Skin or mucosal changes*
   b. Respiratory compromise**
   c. Hypotension or evidence of end-organ dysfunction***
   d. Persistent GI symptoms****

*Skin or mucosal tissue changes include hives, pruritis, flushing, swelling of the lips/tongue/uvula, etc.

**Respiratory compromise refers to dyspnea, wheezing, bronchospasm, stridor, hypoxia, etc.

***Hypotension or evidence of end-organ dysfunction may include systolic BP of less than 90 mmHg (or greater than 30% decrease from baseline BP) in adults OR BP less than age-specific cut-off in pediatric patients, refer to Normal Pediatric Vital Signs, **Pink 8**; hypotonia; collapse; syncope, etc.

****Abdominal pain, vomiting, diarrhea

(Continued on next page)

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 clinician.

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

Altered Level of Consciousness

Assess for trauma, drugs, diabetes, breath odor, needle tracks, medical alert tags, suspected seizure. A thorough history and physical exam is imperative. Bring any available medication lists and collateral information with patient to the hospital. 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.

E

EMT

1. Immobilize spine if indicated
2. Manage airway as appropriate, see Airway Algorithm, **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*****

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7. Establish IV en route
8. Cardiac monitor

Differential Diagnosis of Altered Mental Status	
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

E

EMT

1. Manage airway as appropriate, see Airway Algorithm, **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**. Repeat, as needed, for clinical improvement.
4. If unable to obtain a finger stick blood glucose, and patient is a known diabetic, has clinical signs of hypoglycemia AND IS CONSCIOUS AND ABLE TO SWALLOW, give glucose (one tablet or tube) **orally**. Repeat, as needed, for clinical improvement.

Oral glucose 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

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ADVANCED EMT

5. Establish IV en route
6. If blood glucose is less than **60 mg/dL:**
   a. And patient is conscious and able to swallow, give glucose **orally**, otherwise,
   b. If patient is 40 kg or more, administer dextrose 25 gm **IV** (50 mL of 50% solution or 250 mL of $D_{10}W$ solution),
   c. If under 40 kg give $D_{10}W$ as per the following:

Weight (Kg/Lbs)	Volume to be infused
3/6.6 (newborn)	15 mL
5/11	25 mL
10/22	50 mL
20/44	100 mL
30/66	150 mL
40/88	200 mL

   d. If IV unavailable, DO NOT PLACE IO. Administer glucagon at the following doses:
      i. **Adult** and **Pediatric** patients 20 kg or greater: Glucagon 1 mg **IM**.
      ii. **Pediatric** patients less than 20 kg: Glucagon 0.5 mg **IM**

7. If blood glucose is greater than 300 mg/dL, give NS fluid bolus
8. Repeat glucose measurement every 5 minutes until hypoglycemia is resolved and for any concerns of recurrent hypoglycemia.
9. Cardiac monitor

P

PARAMEDIC

10. Repeat **oral** glucose, **IV** dextrose or **IM** glucagon, if clinically indicated. If oral glucose is contraindicated or oral glucose and **IM** glucagon are ineffective AND **IV** access cannot be established, consider placing an **IO** for administration of dextrose 25 gm (250 mL of **$D_{10}W$**)

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

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PEARLS for Seizures: Most seizures are self-limited. Unless a specific underlying condition exists (e.g., diabetes with hypoglycemia, head injury), 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 Airway Algorithm, **Blue 3**
2. Spinal immobilization as indicated. Refer to Spine Assessment & Management protocol, **Green 3**
3. For head injury, refer to Head Trauma protocol, **Green 8**
4. Left lateral recumbent position and protect patient from injury
5. Request ALS, if available
6. 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**

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

P

PARAMEDIC

10. For patients visibly pregnant or less than 6 weeks postpartum who are seizing or post-ictal, **skip to step 12**.
11. 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/IO** to a MAX dose of 5 mg

    c. If seizure continues, repeat midazolam every 5 min until resolution of seizure, for a **MAX cumulative** total of: **Adult:** 20 mg **IM** or 15 mg **IV/IO**; **Pediatric** 0.6 mg/kg **IM** (20 mg), or 0.3 mg/kg **IV/IO** (15 mg)
        i. Contact the hospital if additional midazolam is necessary

PEARLS for Persistent Seizures: Patients requiring more than one dose of midazolam are potentially very ill and possibly in status epilepticus. Early hospital notification allows the hospital to prepare additional medications to care for the patient.

        ii. Monitor oxygenation and ventilation with O_2 saturation and end-tidal capnography, especially if providing repeated doses of midazolam
        iii. Manage the patient's airway as necessary, see Airway Algorithm, **Blue 3**

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Seizure #2

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12. For patients visibly pregnant or less than 6 weeks postpartum who are seizing or post-ictal,
    a. Magnesium sulfate 4 gm **IV/IO** over 15 minutes via medication pump
        i. If IV/IO not available, magnesium sulfate 8 gm **IM** (4 gm in <u>each</u> buttock)
    b. If **IV/IO** magnesium sulfate was administered AND
        i. Seizing stopped or patient was post-ictal, start magnesium sulfate infusion at 1 gm/hour via medication pump.
        ii. Seizing continues, magnesium sulfate 2 gm **IV/IO** over 5 minutes via medication pump.
            1. If seizing stops after this second **IV/IO** dose of magnesium sulfate start magnesium sulfate infusion at 1 gm/hour via medication pump.
    c. If patient continues to seize, administer one of the following
        i. Midazolam 10 mg IM, or
        ii. Midazolam 5 mg IV/IO
    d. If seizure continues, repeat midazolam every 5 min until resolution of seizure, for a **MAX cumulative** total of 20 mg **IM** or 15 mg **IV/IO**

13. Contact OLMC for the following OPTIONS:
    a. If unable to stop seizure activity, or if therapy beyond these protocols are necessary

P

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.

Stroke #1

Stroke should be suspected whenever a person **suddenly** develops new neurological symptoms or complaints. These most commonly are weakness or loss of sensation to one side of the face or limbs, abnormal speech (slurred or inappropriate words) or comprehension, loss of vision or double vision, dizziness, difficulty with coordination of the limbs or walking. Other symptoms that can be due to stroke include sudden dizziness/vertigo or nausea and vomiting, sudden confusion or alterations in mental status, and sudden onset severe headache for no obvious reason. Some of the most commonly used stroke screens (e.g., CPSS, FAST-ED) may not identify the **Posterior Circulation Stroke** which present as visual deficits, balance/coordination changes, dizziness or nausea and vomiting. However, Posterior Circulation Strokes require prompt treatment and should be evaluated for a stroke alert/activation. Medical Direction should be contacted if the patient presents with a negative initial stroke screen but clinical presentation is still concerning for a possible stroke.

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

See Altered Level of Consciousness 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

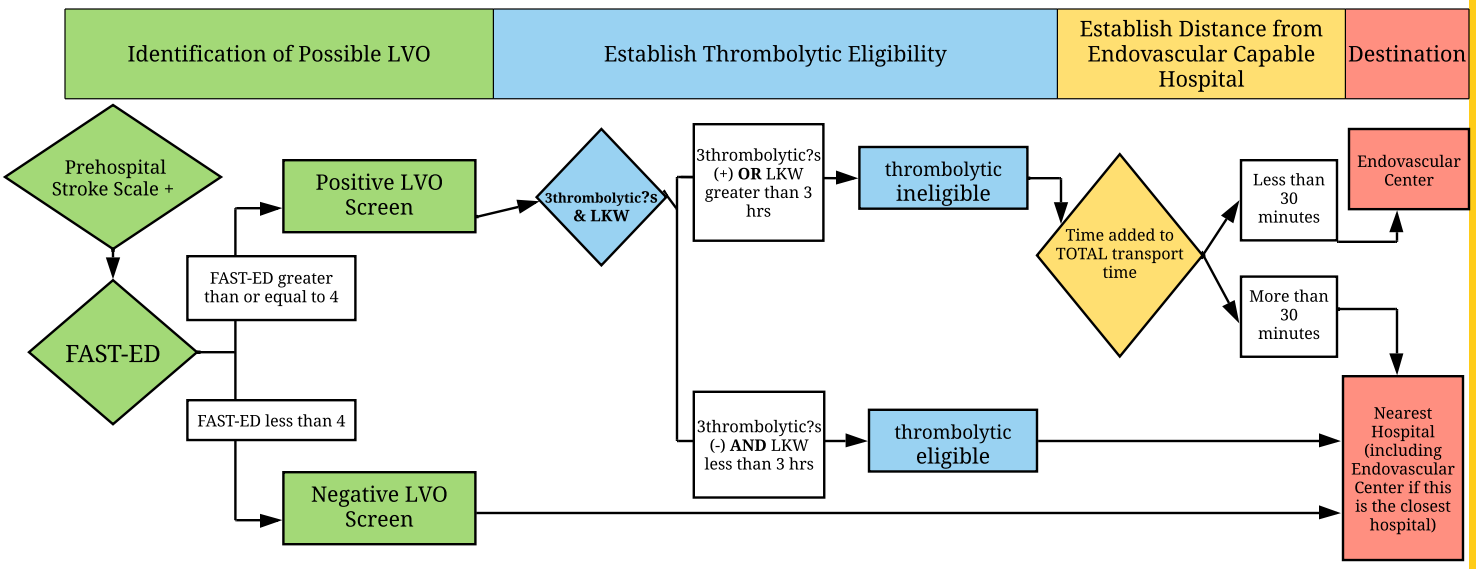
Stroke #2 - Large Vessel Occlusion Screening

All patients who screen positive for stroke by presence of facial droop, speech abnormalities, or drift/weakness 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 thrombolytics. Screening should be performed by all scopes of practice by using the **F**ield **A**ssessment **S**troke **T**riage for **E**mergency **D**estination (FAST-ED) Screening Tool.

		0	1	2	Score
F	**Facial palsy** Ask the patient to smile	Normal or mild facial asymmetry	Obvious droop of one side of the mouth	N/A	
A	**Arm weakness** 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	
S	**Speech changes** 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	
T	**Time Last Known Well (LKW)***	N/A	N/A	N/A	Time LKW: _____
E	**Eye deviation** Observe the patients horizontal eye movements	Normal eye movements	Eyes tend to only move to one side	Eyes both forced over to one side	
D	**Denial/Neglect** Touch the patient on both arms at the same time and ask if they feel both sides; Show the patient their 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	
	TOTAL SCORE				

*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:



"3thrombolytic?s" refers to the thrombolytic checklist screening questions on **Gold 12**. If ALL are answered negative and time criteria are met, the patient is considered thrombolytic eligible. If ANY are answered positive, the patient is thrombolytic ineligible.
LKW refers to the time the patient was Last Known Well and without the presenting stroke symptoms

Acute Stroke #3
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 thrombolytics and should be inquired of all patients with suspected stroke. These are important to hospital clinicians determining eligibility for thrombolytics AND when determining entry destination for possible LVO Strokes (referred to in the algorithm as "3thrombolytics?s")

Please present these findings to the Emergency Medicine Staff at the receiving hospital. The patient's LKW and the answers to these questions are essential in determining the risks of severe bleeding complications if thrombolysis is administered and it is of critical importance to relay this information to the Emergency Medical staff at the receiving hospital.

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 enoxaparin (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.

Platelet inhibitors, such as aspirin, clopidogrel (Plavix), ticagrelor (Brilinta), and prasugrel (Effient) are **NOT** considered anticoagulants, but as with all medications, the receiving clinician should be made aware of their use.

Stroke #4

E

EMT

1. Manage airway as appropriate, see Airway Algorithm, **Blue 3**
2. Maintain O_2 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 Stoke 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
8. If available and so trained, perform 12-lead ECG en route.

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9. Cardiac monitor
10. IV en route
11. 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.
- Consider **stroke mimics** including: migraine, hypoglycemia, seizures, intoxication, sepsis.
- The management of an LVO stroke is a COMBINATION of rapid provision of thrombolytic 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.

Medical Shock #1

See Cardiogenic Shock protocol, **Red 27** if appropriate
See Hemorrhagic Shock protocol, **Green 13** if appropriate
See Allergy and Anaphylaxis protocol, **Gold 1** if appropriate
See Airway Algorithm, **Blue 3** if appropriate

IDENTIFICATION OF POSSIBLE SEPSIS

- Suspected infection? **AND:**
- Evidence of sepsis criteria? Includes **two or more** of the following:
  - Temperature less than 96.8°F (36°C) or greater than 101°F (38.3°C)
  - Heart rate greater than 90 bpm
  - Respiratory rate greater than 20 bpm
  - Evidence of hypotension:
    - **Adults**: systolic blood pressure less than 90 mmHg or Mean Arterial Pressure (MAP) less than 65 mmHg
    - **Pediatrics**: systolic BP less than age appropriate cutoff, mottling, capillary refill less than one second (flash) or greater than 3 seconds (delayed)
  - New onset altered mental status OR increasing mental status change with previous altered mental status

E

EMT

1. Attempt to identify cause
   a. Hemorrhagic Shock, see Hemorrhagic Shock protocol, **Green 13**
   b. Cardiogenic Shock, see Cardiogenic Shock protocol, **Red 27**
   c. Anaphylactic Shock, see Allergy/Anaphylaxis protocol, **Gold 1**
2. Manage airway as appropriate, see Airway Algorithm, **Blue 3**
3. Request ALS, if available, and notify receiving hospital that the patient is a "Code Sepsis." When available, ALS is valuable in these patients and allows for initiation of essential therapies, including resuscitati

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

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ADVANCED EMT

6. For Severe Sepsis
   a. Assess for acute pulmonary edema. If present, refer to Cardiogenic Shock protocol, **Red 27**
   b. Administer up to 30 mL/kg fluid bolus.
   c. For patients with evidence of fluid overload or at risk for fluid overload, consider consultation with OLMC for different resuscitation volume goals.

PEARLS for Sepsis: Patients at risk for fluid overload include, but are not limited to, patients over 65 years of age, patients with a history of heart failure, patients on dialysis for renal failure. Such patients may benefit from smaller volumes of resuscitation and earlier initiation of pressors.

   d. Monitor closely during resuscitation. Goals of resuscitation in shock and sepsis are to treat hypotension and/or signs of hypoperfusion

(Continued)

Medical Shock #2

(Continued from previous page)

PARAMEDIC

7. For medical or presumed septic shock
   a. If no response to initial treatment: initiate NOREPInephrine **IV infusion**. NOREPInephrine infusions must be administered via a Maine EMS approved medication pump.
      i. **Preparation** – mix NOREPInephrine 8 mg in 250 mL NS [32 mcg/mL]
      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.
      iii. **Titrate** to maintain SBP greater than 90 mmHg and/or MAP > 65 mmHg

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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 16 mg **IV/IO/IM** x 1 dose
   b. **Pediatrics** - dexamethasone 0.6 mg/kg with MAX single dose of 16 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. Whenever possible, use proximal IV access.
- Patients suffering from sepsis or septic shock are very ill patients and the care of these patients may be nuanced. Please consider the value of On Line Medical Control discussion for any questions or concerns regarding the management of these patients.

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^{o} F or less than 96.8^{o} F (greater than 38.3^{o} C or less than 36^{o} 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	> 24

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

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.

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 Airway Algorithm, **Blue 3**
2. If evidence of shock, refer to the Medical Shock protocol, **Gold 14**
3. If available and so trained, perform 12-lead ECG in patients with prior history of cardiac disease or risk factors for cardiac disease

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ADVANCED EMT

4. Establish IV
5. 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 clinician's discretion

P

PARAMEDIC

6. Perform pain-rating score on 1-10 scale
7. 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

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   i. If repeated doses necessary, contact OLMC 

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

Obstetric Emergencies

Most pregnancies progress with no complications. In cases of pregnancy with either vaginal bleeding or abdominal/pelvic pain, consider the following possibilities:

1. Abruptio placenta: placenta prematurely separates from the uterus causing intrauterine bleeding
2. Placenta previa: placenta covers part or all of the cervical opening
3. Ectopic pregnancy (ruptured)
4. Spontaneous abortion (miscarriage)
5. Pre-Eclampsia/Eclampsia (can occur for up to 6 weeks postpartum), refer to Seizure protocol, **Gold 9**
6. Postpartum Hemorrhage

EMT

1. Manage airway as appropriate, see Airway Algorithm, **Blue 3**
2. Monitor vitals. If evidence of shock refer to the Hemorrhagic Shock protocol, **Green 13.** Contact ALS, if available
   a. Patients in third trimester of pregnancy with evidence of shock should be transported on their side (either left or right), or with uterus manually displaced to the left or right*
3. If the patient is pregnant with abdominal/pelvic pain, bleeding or concern for any of the above conditions, and the patient condition permits, transport to the nearest hospital with OB capabilities if total transport time is less than 45 minutes, otherwise go to the closest ED.
4. For trauma related to pregnancy, follow Trauma Triage guideline, **Green 1**
5. Notify Hospital of incoming patient
6. Contact OLMC for decision support if questions regarding patient transport destination.

7. Refer to Childbirth protocol, **Pink 4**
8. If history of syncope/lightheadedness, if available and so trained, perform 12-lead ECG

ADVANCED EMT

9. Establish IV. If evidence of shock, resuscitate with fluid boluses

PARAMEDIC

10. For patients suffering postpartum hemorrhage and demonstrating evidence of shock, refer to the Hemorrhagic Shock protocol, **Green 13** and consider tranexamic acid (TXA).
    a. NOTE - TXA is contraindicated in patients greater than 24 weeks pregnant (or pregnant with fundus above umbilicus) suffering hemorrhagic shock due to trauma, refer to Hemorrhagic Shock protocol, **Green 13**

Pearls for Obstetric Emergencies

- Even minor trauma beyond the second trimester can lead to significant consequences for the pregnancy. In some cases, these patients require fetal monitoring and therefore should be transported.
- Syncope can be a presenting symptom of hemorrhage from ectopic pregnancy or causes of vaginal bleeding.
- Do not place hand/fingers into vagina of bleeding patient except in cases of prolapsed cord or breech birth that is not progressing
- Please note, on scene Obstetric clinicians may provide TXA. Please ensure TXA has not been previously provided before proceeding with TXA.
- *When placing patient in a lateral position, consider patient comfort and ease of access to patient when choosing right or left side.

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 Airway Algorithm, **Blue 3**
2. Transport in position of comfort, unless contraindicated
3. If available and so trained, perform 12-lead ECG if the patient has a history of cardiac disease, risk factors for cardiac disease, or based on the EMS clinician's discretion.

A P

ADVANCED EMT/PARAMEDIC

4. Consider Ondansetron: (Remember: do not administer if patient has history of long QT syndrome)
   a. **Adults**: administer ondansetron 4 mg ODT tablet **PO,** or ondansetron 4 mg **IV/IM**
      i. May repeat once after 15 minutes as needed.
   b. **Pediatric** patients:
      i. 6 months to less than 4 years old: ondansetron 2 mg **IV/IM**
      ii. 4 years old and above: ondansetron 4 mg **PO/IV/IM**

5. Consider IV access if active vomiting or for management of underlying cause
6. Consider fluid bolus if actively vomiting

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7. 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

Fever

E A P

This protocol applies to patients with measured temperatures greater than or equal to 101F (38.3C) who have NOT received any acetaminophen-containing medications in the past 6 hours, do NOT have underlying liver disease AND are NOT allergic to acetaminophen.

EMT/ADVANCED EMT/PARAMEDIC

1. If infection suspected, see Medical Shock protocol, **Gold 14**
2. Begin passive cooling by turning on fan/air conditioning in patient compartment and uncover the patient.
3. If no contraindications to oral medications exist, for patients 5 years and older AND 20 pounds/9.4 kg or greater, consider:
   a. Acetaminophen chewable tab, 10-15 mg/kg rounded to the nearest half tab (may be chewed or swallowed whole). MAX dose 1000 mg.
4. Monitor closely for development of hypothermia or other vital sign abnormalities

Weight lbs/kgs	Dose	Number of 160 mg Chew tabs (double number for 80 mg tabs)
NOTE: Oral Acetaminophen is for children 5 years and older AND 20 lbs. and over		
20 – 26 lbs/9.4 – 12 kgs	160 mg	1 tab
27 – 32 lbs/12.1 - 14.7 kgs	200 mg	1 tab
32 – 38 lbs/14.8 - 17.3 kgs	240 mg	1.5 tabs
38 - 44 lbs/17.4 – 20 kgs	280 mg	1.5 tabs
44 – 50 lbs/20.1 - 22.7 kgs	320 mg	2 tabs
50 – 56 lbs/22.8 - 25.3 kgs	360 mg	2 tabs
56 – 65 lbs/25.4 - 29.3 kgs	400 mg	2.5 tabs
65 – 76 lbs/29.4 - 34.7 kgs	480 mg	3 tabs
76 – 89 lbs/34.8 - 40.3 kgs	560 mg	3.5 tabs
89 – 120 lbs/40.4 – 55 kgs	640 mg	4 tabs
121 lbs and up/ 55.1 kgs and up	960 - 1000 mg	6 tabs

PEARLS
Temperature reliability is dependent on the method utilized. Rectal temperature is the most reliable, followed by oral and axillary routes. Temporal measurement of temperature has low reliability.

Trauma Triage #1
(Patient with Blunt or Penetrating Trauma)

Red Criteria
High Risk for Serious Injury

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

Yes

Go to nearest **Level 1 or 2 Trauma** Center if total transport time is less than 45 minutes, otherwise go to highest-level trauma center available OR the closest ED which is a trauma system participating hospital; any questions, contact OLMC

No

*Obtain a manual blood pressure whenever possible, and consider monitoring pulse pressure as an early sign of hypotension

Yes

Yellow Criteria
Moderate Risk for Serious Injury

Mechanism of Injury	EMS Judgment
• High-Risk Auto Crash ◦ Partial or complete ejection ◦ Significant intrusion (including roof) ▪ >12 inches occupant site OR ▪ >18 inches any site OR ▪ Need for extrication for entrapped patient ◦ Death in passenger compartment ◦ Child (age 0-9 years) unrestrained or in unsecured child safety seat ◦ Vehicle telemetry data consistent with severe injury • Rider separated from transport vehicle with significant impact (e.g., motorcycle, ATV, horse, etc.) • Pedestrian/bicycle rider thrown, run over, or with significant impact • Fall from height > 10 feet (all ages) • Lightening strike/electrical trauma • Significant burn: >10% BSA (counting only partial and full thickness burns), circumferential burns, airway involvement, genital burns and burns to the hands or face)	**Consider risk factors, including:** • Low-level falls in young children (age </= 5 years) or older adults (age >/= 65 years) with significant head impact • Anticoagulant use • Suspicion of child abuse • Special, high-resource healthcare needs • Pregnancy > 20 weeks • Burns in conjunction with trauma • Children should be triaged preferentially to pediatric capable centers **If concerned, take to a trauma center**

No

Transport to nearest Trauma System participating hospital

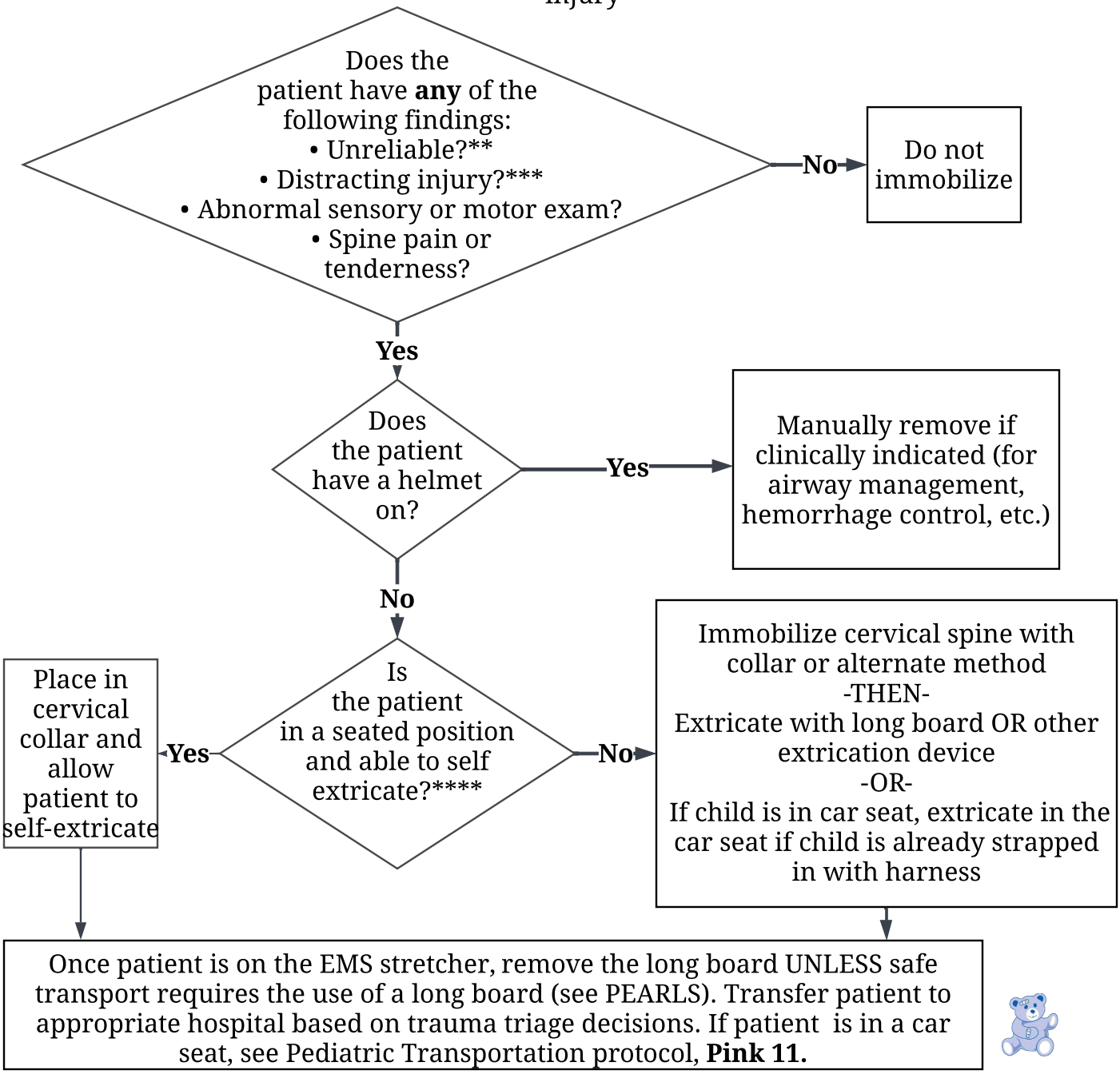
Trauma Triage #2
(Patient with Blunt or Penetrating Trauma)

Pearls

- EMS clinician triage to the appropriate level Trauma Center is beneficial to patient outcomes.
- Patients with any suspicion for specialty surgical needs (including neurosurgical injury) should be transferred to a Level 1 or Level 2 Trauma Center whenever possible.
- If additional transfer time to a Level 1 or Level 2 Trauma Center is felt to be deleterious to the patient, transfer to the highest-level Trauma Center available or the closest emergency department.
- If prehospital clinicians are unable to definitively manage the airway, maintain breathing or support circulation, begin transport to the the most accessible hospital and simultaneously request ALS intercept or tiered response.
- For questions, refer to OLMC.

Spine Assessment & Management #1

This protocol is for suspected spinal injury, based on the 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.

**** Patients are able to self-extricate from a motor vehicle or seated position to an EMS stretcher 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 stretcher should be in close proximity to the patient.

Patients in the lying position should be moved to the EMS stretcher 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 stretcher. 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.

PEARLS for Spine Management

Role of Backboards - While the MDPB is attempting to limit the use of backboards, prehospital and hospital clinicians 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 stretcher, 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 clinicians 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 stretcher. Emphasis should be on airway and breathing management, treatment of shock, and rapid transport following the MEMS Trauma Triage protocol, **Green 3**.

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 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. 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	Child	Infant	Score
Eye Opening Response			
Open spontaneously	Same as Adult		4
Open to voice command	Same as Adult		3
Open to painful stimuli	Same as Adult		2
Eyes remain closed	Same as Adult		1
Best Motor Response			
Moves on command	Obeys commands	Moves spontaneously/ purposefully	6
Pushes painful stimuli away	Localizes painful stimuli	Withdraws to touch	5
Withdraws from painful stimuli	Withdraws in response to pain	Withdraws in response to pain	4
Decorticate (flexion)	Flexion in response to pain	Abnormal flexion in response to pain	3
Decerebrate (extension)	Extension in response to pain	Abnormal extension in response to pain	2
No motor response to pain	No response	No response	1
Best Verbal Response			
Oriented	Oriented/Appropriate	Coos and babbles	5
Confused	Confused	Irritable, cries	4
Inappropriate words	Inappropriate words	Cries to pain	3
Incomprehensible sounds	Incomprehensible sounds	Moans to pain	2
No sounds	No response	No response	1
Total			3-15

Chest Trauma

E

EMT

1. Administer O_2 or assist ventilations (PPV) as appropriate, refer to Airway Algorithm, **Blue 3**.
2. Request ALS, if available.
3. Impaled Objects:
   a. Secure in place with bulky dressings.
4. 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.
5. Flail segment with paradoxical movement and respiratory distress:
   a. Consider PPV,
   b. Consider applying non-circumferential splint.
6. If available, and so trained, consider 12-lead ECG.

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ADVANCED EMT

7. Establish IV en route.
8. If shock present, perform fluid bolus.
9. Cardiac monitor and consider 12-lead ECG.
10. Request Paramedic, if available.

P

PARAMEDIC

11. For presumed TENSION pneumothorax only, perform chest decompression. Assume tension pneumothorax in ALL traumatic arrests.

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, DO NOT remove previous catheter(s), 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 #1

Definition: Prehospital identification of moderate to severe Traumatic Brain Injury (TBI): Any patient with physical trauma and a mechanism consistent with the *potential* to have induced a brain injury and:

- Any injured patient with ***loss of consciousness***, especially those with a ***GCS less than 15*** or ***decreased level of consciousness***, ***decreased responsiveness***, or ***any deterioration of mental status***. Please recall, GCS may be difficult to obtain or interpret in young children or infants. Focus on the child's level of consciousness, decreased responsiveness or mental status change,

OR

- Any multi-system trauma ***requiring BVM*** (or advanced airway/ventilation),

OR

- Any ***post-traumatic seizures.***

Continuously monitor and re-evaluate every 3-5 minutes, including:
1. Continuous O_2 saturation via pulse oximetry,
2. Systolic blood pressure,
3. If available, use continuous quantitative end-tidal CO_2 ($EtCO_2$) monitoring for ALL severe TBI patients (AEMT/PARAMEDIC).

EMT
1. Consider immobilizing the spine if indicated per Spine Assessment and Management protocol, **Green 3**.
2. If not in shock, elevate head of bed to 30 degrees while maintaining spinal immobilization, if necessary.

<u>Management of Airway/Oxygenation</u>

3. Place continuous high-flow O_2 via non-rebreather mask on *all* potential TBI cases.
4. Identify and treat any episode of hypoxia (O_2 saturation less than 90% and/or any evidence of cyanosis).
5. If high-flow O_2 fails to correct hypoxia, treat per Airway Algorithm, **Blue 3**.
6. Continue to monitor/re-evaluate every 3-5 minutes.

E

- **PEARL:** A **single** oxygen saturation less than 90% is independently associated with at least a doubling of mortality.

<u>Management of Ventilation</u>

7. If there is evidence of hypoventilation despite high-flow oxygen, refer to Airway Algorithm, **Blue 3**.
8. Target ventilation rates (from the National TBI Guidelines):
   a. **PEDIATRIC** age 0-2 years: 1 breath every 2-3 seconds (25 breaths per minute)
   b. **PEDIATRIC** age 3-14 years: 1 breath every 3 seconds (20 breaths per minute)
   c. Adolescents/Adults age 15+: 1 breath every 6 seconds (10 breaths per minute)

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E

- **PEARL:** Hyperventilation is independently associated with at least a doubling of mortality. Some studies have shown that even moderate hyperventilation can increase the risk of dying by six times. Evidence has shown repeatedly that inadvertent hyperventilation occurs if not meticulously prevented by using adjuncts to assist deterrence, no matter the experience of the EMS clinician. Adjuncts including Pressure-Controlled Bags (PCBs), Ventilation Rate Timers (VRTs) should be used when available, $EtCO_2$ monitoring (AEMT/PARAMEDIC) should be used on every patient with airway management. if so trained and equipped.
- Hypoventilation is defined as ineffective respiratory rate, shallow or irregular respirations, or periods of apnea.

Management of Hypoglycemia

9. Check for hypoglycemia in patients with any alteration of mental status. Refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6** for treatment.

ADVANCED EMT/PARAMEDIC

Management of Ventilation

10. Adjust ventilatory rates to meet goal $EtCO_2$ levels between 35 and 45 mmHg, (target = 40 mmHg).

A P

- **PEARL:** This TBI guideline does not encourage any hyperventilation (as was encouraged in previous protocol updates) for impending cerebral herniation for the following reasons:
  - There is no evidence that hyperventilation improves patient outcomes.
  - There is evidence that even mild hyperventilation harms TBI patients, even those with severe head injury

Management of Hypotension/Blood Pressure

11. In patients with any *potential* for TBI, immediately initiate IV access to ensure maintenance of SBP.
12. PEDIATRICS - GOAL SBP defined below:
    a. Hypotension is defined as SBP below the 5th percentile for age, estimated using the following guide:
       i. Age 0-10: 70 mmHg + (age x 2)
       ii. Age greater than 10: 90 mmHg (same as adolescents and adults)
       iii. "Rules of Thumb" to remember:
          1. Infant = 70 mmHg
          2. 5 year old = 80 mmHg
          3. 10 years and older = 90 mmHg

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b. For SBP below goal for age, give 20 ml/kg IV bolus every 5 minutes until age-based goal SBP for age is achieved.

13. ADOLESCENTS and ADULTS - Goal SBP = greater than 90 mmHg.
    a. Initiate fluid resuscitation with an initial bolus of 1 liter for any SBP measurement less than 90 mmHg.
    b. Continue IV fluid administration at a rate and volume sufficient to maintain SBP greater than 90 mmHg.

PEARLS for Management of Hypotension/Blood Pressure

- A single episode of SBP <90 mmHg is independently associated with at least a doubling of mortality. Repeated episodes of hypotension can increase the risk of dying by as much as *eight* times. Hypotension kills neurons!
- In the context of Head Trauma, do not allow permissive hypotension below 90 mmHg (in adults) and do not wait for the patient to become hypotensive. If the SBP is dropping, or if there are any other signs of compensated shock such as increasing heart rate with decreasing SBP, begin aggressive treatment before the patient becomes hypotensive.
- In TBI, treatment of acute hypertension is **NOT** recommended.
- IV fluids should be restricted to a minimal "keep open" rate in patients with, SBP ≥ 100 mmHg (infants/young children) SBP ≥ 130 mmHg (older children/adolescents), and SBP ≥140 mmHg in adults.

A P

14. For Nausea and Vomiting, refer to Nausea/Vomiting protocol, **Gold 19. Please Note: IV/IO** Ondansetron is the preferred route for patients with moderate to severe head injuries.

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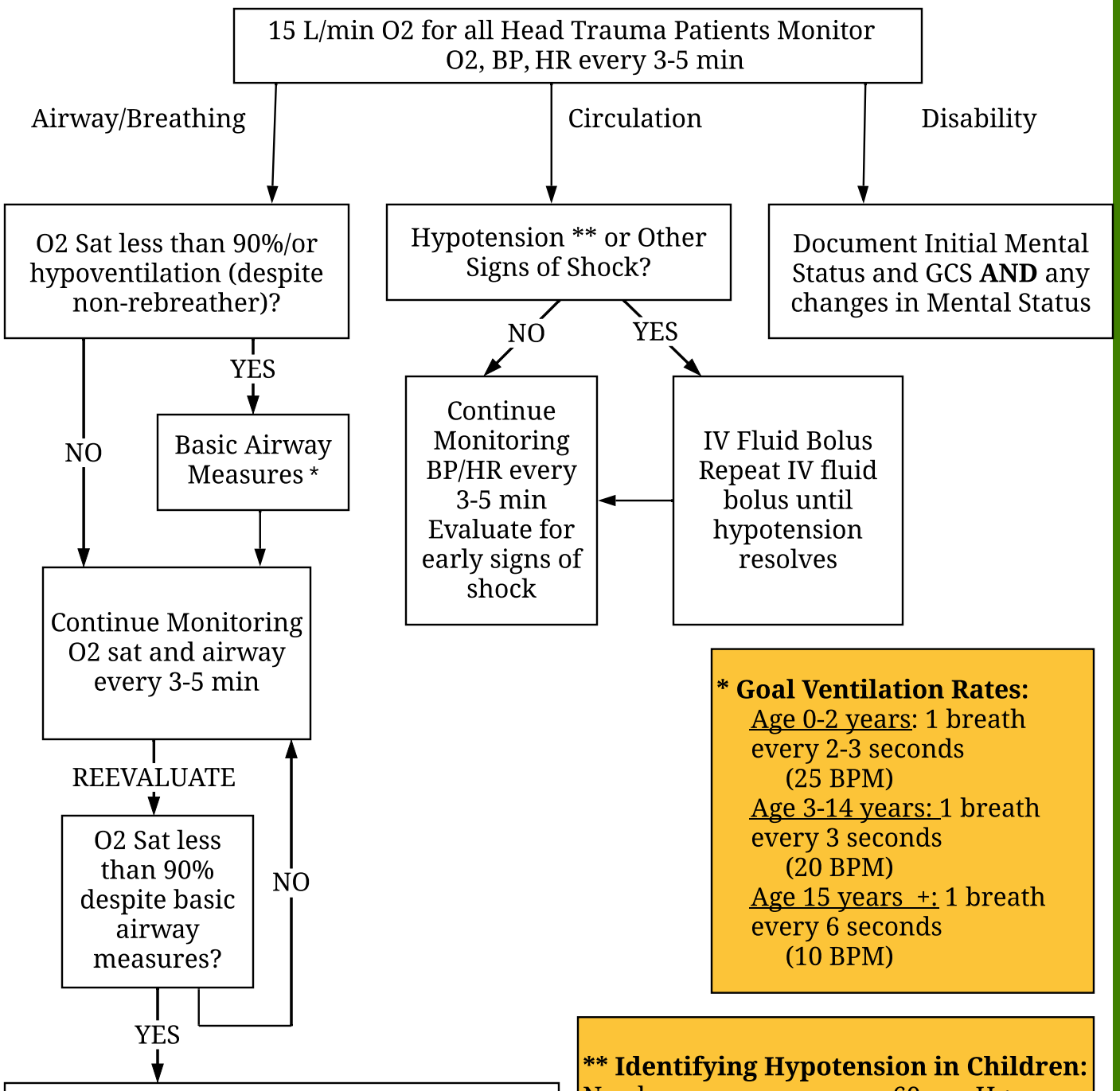
Head Trauma, #4



*** Goal Ventilation Rates:**

Age 0-2 years: 1 breath every 2-3 seconds (25 BPM)

Age 3-14 years: 1 breath every 3 seconds (20 BPM)

Age 15 years +: 1 breath every 6 seconds (10 BPM)

**** Identifying Hypotension in Children:**

Newborn:	60 mmHg
Age 0-2 years:	70 mmHg
Age 3-9	70+ (age x 2)
Age 10 years or greater:	greater than 90 mmHg

General Rules:

Newborn: greater than 60 mmHg

5 Year Old: greater than 80 mmHg

10 years and older: greater than 90 mmHg

Hemorrhage

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EMT

1. Ascertain all sites of bleeding and control with direct pressure and elevation.
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 (if epistaxis, see Facial/dental protocols, **Green 24**), 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.

A P

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 NOT related to hemorrhage , consider the following protocols:
Anaphylaxis, refer to the Anaphylaxis protocol, **Gold 1**
Cardiogenic, refer to the Cardiogenic Shock protocol, **Red 27**
Tension Pneumothorax, refer to the Chest Trauma protocol, **Green 7**
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 Airway Algorithm, **Blue 3**.
3. If patient is in third trimester of pregnancy:
   a. Place patient in left or right lateral recumbent position and re-evaluate.
   b. If shock is secondary to trauma, immobilize patient on a spinal board before placing in left or right lateral recumbent position (manually displace uterus to the left or right if tilting the board is not possible).
4. If the cause of hypovolemic shock is felt to be secondary to acute unstable pelvic fracture, apply a Maine EMS-approved pelvic stabilization device. If Maine EMS-approved pelvic binder is not available, immobilize with a sheet wrap.
5. Request ALS.

A P

ADVANCED EMT/PARAMEDIC

6. Establish IV en route.
7. Cardiac monitor
8. 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 age appropriate target systolic BP (90 mmHg in adults).
   c. Suspected TBI/CNS injury: fluid bolus to maintain BP *greater than* 90 mmHg.

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 while still aiming for age-appropriate BP in hemorrhagic shock and head injuries.

9. Contact OLMC if patient is older than 65 years of age for fluid bolus order
10. Contact OLMC if blood pressure remains less than 90 systolic after fluid boluses

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Hemorrhagic Shock #2

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PARAMEDIC

11. In patients with either penetrating/blunt trauma **OR** post-partum hemorrhage **AND**:
    a. Are greater than or equal to 16 years of age, and
    b. Are hemodynamically unstable as evidenced by tachycardia, hypotension or other evidence of shock, and
    c. Who are less than 180 minutes (3 hours) from the time of injury/hemorrhage, consider:
        i. Tranexamic acid (TXA) 1 gram **IV** mixed in 250 ml of NS over 10 minutes

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1. **NOTE**: Discuss the use of TXA in patients on anticoagulation with OLMC before providing medication.* (see Pearls)

2. **NOTE**: **CONTRAINDICATIONS** for tranexamic acid (TXA) include:
    - **Isolated** head injury (multi-trauma patients with hemorrhagic shock SHOULD receive TXA regardless of head injury),
    - Patients younger than 16 years old,
    - Patients greater than 24 wks pregnant (or pregnant with fundus above umbilicus) suffering hemorrhagic shock due to trauma,
    - Patients with known hypercoagulable states,
    - The patient is more than 180 minutes (3 hours) from the time of injury,
    - Patients with hemorrhage due to GI bleeding

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 (one) hour of injury and absolutely before 3 hours from injury.

<u>Please ensure that receiving hospital staff:</u>

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.

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Hemorrhagic Shock #3

Additional PEARLS for Hemorrhagic Shock:

1) **TXA and GI Bleeding:** Recent evidence suggests patients with gastrointestinal bleeding SHOULD NOT receive tranexamic acid. Patients with GI bleeding who received TXA had no improvement in mortality but did suffer increased morbidity, including increased venous thromboembolic events.

2) **TXA and Isolated Head Injury:** The role of TXA in isolated head injury remains controversial with conflicting evidence in the medical literature. The most recent evidence suggests an association between prehospital TXA and increased mortality in patients with isolated severe brain injury. In an effort to maintain the upmost patient safety and promote the best possible patient outcomes, **isolated** head trauma remains a contraindication for TXA in the protocols. As a reminder, multi-trauma patients with hemorrhagic shock SHOULD receive TXA regardless of head injury.

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% (> 2000 mL)
Pulse	Normal	Elevated (>100)	Elevated (>120)	Elevated (>140)
Blood Pressure	Normal	Orthostatic Change	Marked Decrease	Profound Decrease
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

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EMT

1. Remove burned clothing and/or jewelry, unless adhered to patient.
2. Administer O_2, 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, severe* burns or need for pain medication. Severe burns should be transported following the Trauma Triage protocols, **Green 1**.

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7. Establish 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 x wt (kg) x % BSA = mL/hr (this represents the patient's fluid requirement each hour for the first 8 hours after the burn)

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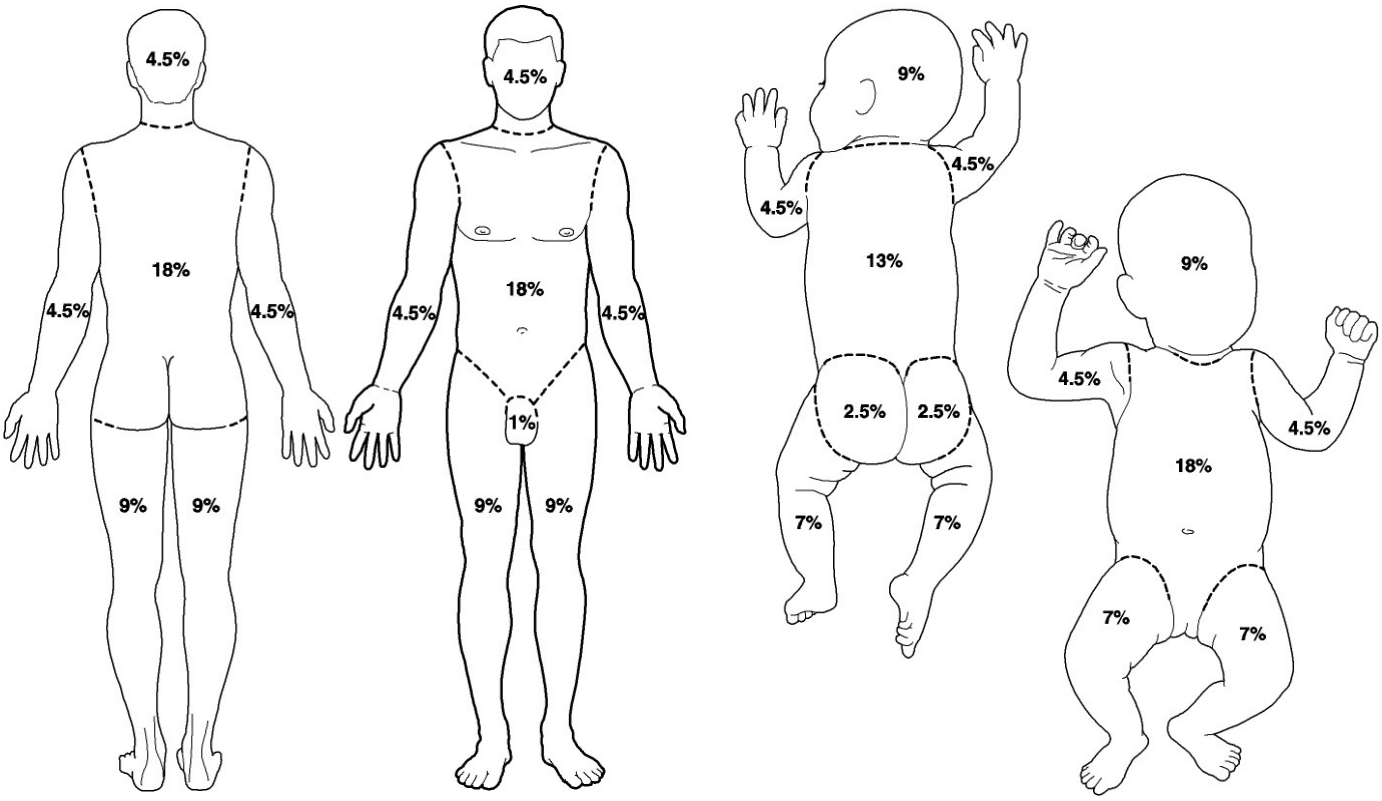
PARAMEDIC

11. For pain control, refer to the Universal Pain Management protocol, **Green 18**.

PEARLS for Burn Management

- *Severe burns include greater than 10% body surface area (counting only partial and full thickness burns), circumferential burns, airway involvement, genital burns, and burns to the hands or face. Severe burns should be transported following the Trauma Triage Guidelines, **Green 1.**
- 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.

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.

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

EMT

1. Provide verbal reassurance.
2. Splinting as needed, provide in-line stabilization. Consider cold pack application in isolated extremity trauma if hypothermia/frostbite is not present.
3. Evaluate pain using age-appropriate pain scale.
4. If pain not improved by above measures and no contraindications to oral medications exist, for patients 5 years and older AND 20 lbs/9.4 kg or over consider:
    a. Acetaminophen chewable tab, 10 - 15 mg/kg **PO** rounded to the nearest half tab (may be chewed or swallowed whole). MAX dose 1,000 mg.
    b. NOTE: Acetaminophen is contraindicated for patients with known or suspected liver disease or for those who have received acetaminophen within the past 6 hours.
5. Request ALS if needed for pain management or management of underlying injury.

Weight lbs/kgs	Dose IV or PO 10 - 15 mg/kg	Number of 160 mg Chew tabs (double number for 80 mg tabs)
NOTE: Oral Acetaminophen is for children 5 years and older AND 20 lbs. and over		
20 – 26 lbs/9.4 – 12 kgs	160 mg	1 tab
27 – 32 lbs/12.1 - 14.7 kgs	200 mg	1 tab
32 – 38 lbs/14.8 - 17.3 kgs	240 mg	1.5 tabs
38 - 44 lbs/17.4 – 20 kgs	280 mg	1.5 tabs
44 – 50 lbs/20.1 - 22.7 kgs	320 mg	2 tabs
50 – 56 lbs/22.8 - 25.3 kgs	360 mg	2 tabs
56 – 65 lbs/25.4 - 29.3 kgs	400 mg	2.5 tabs
65 – 76 lbs/29.4 - 34.7 kgs	480 mg	3 tabs
76 – 89 lbs/34.8 - 40.3 kgs	560 mg	3.5 tabs
89 – 120 lbs/40.4 – 55 kgs	640 mg	4 tabs
121 lbs and up/ 55.1 kgs and up	960 - 1000 mg	6 tabs

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ADVANCED EMT

6. Consider IV access in preparation for additional pain management.
7. Consider cardiac monitoring based on patient assessment or injury etiology.
8. If contraindication to oral pain medications in patients **70 kg or greater**, consider acetaminophen **IV** 1000 mg (1 gram) **IV** once, over 15 minutes.
9. If nausea/vomiting, refer to Nausea and Vomiting protocol, **Gold 19**.

PARAMEDIC

10. If contraindication to oral pain medications, consider acetaminophen 10-15 mg/kg **IV** once up to 1000 mg, over 15 minutes.
    a. NOTE: doses of acetaminophen less than 1000 mg require infusion via pump.
11. For stable patients continuing to suffer pain from trauma or other listed inclusion criteria, consider the use of any **ONE** of the following medications:
    a. **Either** 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. **NOTE**: Fentanyl may be ineffective in patients with underlying opioid use disorder, on opioids chronically (e.g., methadone) or on opioid antagonists (e.g. buprenorphine/naloxone [Suboxone]).
    b. **OR**, Ketamine:
        i. Ketamine 0.2 mg/kg **IV** to a MAX dose of 25 mg. Mix in 100 mL bag of saline and infuse over 10 minutes via a pump.
            1. Repeat in 15 minutes as needed for continued 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** to a MAX dose of 25 mg in 15 minutes as needed for pain x 1.
        iii. **NOTE**: Ketamine is contraindicated in infants less than 3 months old and those with cardiogenic shock (or history of heart failure).
    c. **OR,** 50% nitrous oxide/oxygen mixture self-administered ONLY until patient removes mask or pain is controlled i.e. a blended 50/50 mixture.
        i. NOTE : Nitrous Oxide is contraindicated in suspected pneumothorax or bowel obstructions .

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12. Contact OLMC before using any analgesic (beyond acetaminophen) in:
    i. Isolated trauma involving the head,
    ii. Back pain,
    iii. Non-traumatic extremity pain,
    iv. Any patient with mental status changes,
    v. Any patient with unstable vital signs (including SBP < 100 mmHg),
    vi. Coincident drug use (including alcohol).

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13. Contact OLMC if desiring to switch from one type of analgesic to another (other than from acetaminophen), no matter the duration of time that has passed since dosing the initial agent. Adding one class of medications to another can have additive effects such as hypotension, bradypnea, depression of mental status, etc.

14. Transport in position of comfort and reassess pain, as indicated.

PEARLS for Pain Management:

1. Consider the potential for medical causes of trauma, especially in the elderly, lift assist patient, falls, and syncope. In such cases, refer to the appropriate protocol and monitor the patient as described.

2. 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 step wise fashion similar to climbing the rungs of a ladder. Therefore, it is expected that all clinicians, regardless of license level, will manage patients in the step wise fashion to the maximum scope of practice of their licenses.

3. **Pearls for acetaminophen**: Patients with underlying liver disease or those who have taken acetaminophen within the last 6 hours should NOT receive acetaminophen. If IV acetaminophen is supplied in a glass container, vented tubing is required for proper administration. Acetaminophen should be administered, over 15 minutes.

4. **Pearls for fentanyl:** Fentanyl may be considered the first line analgesic after acetaminophen. Adverse effects include bradypnea and hypotension.

5. **Pearls for ketamine**: Ketamine may be preferential for patients with a history of opioid intolerance or opioid use disorder. Ketamine must be infused slowly to reduce the incidence of complications including hypotension, bradypnea, and laryngospasm.

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Pediatric considerations:

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

a. Ages less than 4 years, use FLACC Scale,
b. Ages 4-12 years, use Wong Baker "Faces" Scale,
c. 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

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Do NOT initiate cardiac arrest resuscitation regardless of transport if any of the following exist:

- Injuries incompatible with life
- Evidence of significant time lapse since pulselessness, including dependent lividity, rigor mortis or decomposition

Inclusion Criteria:

- Cardiac arrest from blunt or penetrating trauma in **adult** and **pediatric** patients

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

- Patients whose presentation is consistent with a medical cause of cardiac arrest, refer to Adult Cardiac Arrest protocol, **Red 8** or Pediatric Cardiac Arrest Protocol, **Red 17**
- Hypothermic Patients, refer to Severe Hypothermia WITHOUT Signs of Life protocol, **Yellow 12**
- Drowning patients, refer to Drowning/Submersion Injuries protocol, **Yellow 15**

EMT

1. If a patient suffers cardiac arrest from a traumatic injury, consider resuscitation and transport initiation ONLY if, transporting in a safe and prudent manner, you can deliver the patient to a higher level of care within 15 minutes of the TIME OF ARREST.*
2. If resuscitation is initiated, manage massive hemorrhage per Hemorrhage protocol, **Green 12,** and airway per Airway Algorithm, **Blue 3**.
3. If unable to meet these transport guidelines, do NOT initiate resuscitation in trauma patients who are already apneic and pulseless when you arrive on scene.

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ADVANCED EMT

4. If resuscitation initiated, administer rapid fluid bolus.

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PARAMEDIC

5. If resuscitation initiated, perform BILATERAL needle decompression of the chest to alleviate potential tension pneumothoraces (refer to Chest Trauma protocol, **Green** 7 for decompression procedure).

PEARLS

- The treatment for cardiac arrest secondary to traumatic injury should include CPR, but transport to definitive care should NOT be delayed. Each of these calls involve unique circumstances which will require crews to weigh the benefits of transporting immediately against the risks of delaying some prehospital interventions. The safety of providers should always be prioritized during transport, and, if available, mechanical CPR devices should be in place prior to transport for patients who may arrest during transport.
- Resuscitation of traumatic cardiac arrests include ACLS, but the treatment should also include early bilateral chest needle decompression and IV fluid boluses in addition to airway management.
- If you suspect that an underlying medical cause led to the patient's arrest, continue to manage per Adult Cardiac Arrest **(Red 8)** or Pediatric Cardiac Arrest **(Red 17)** protocols.
- *Consider calling for ALS early in traumas where the patient is high-risk for traumatic cardiac arrest (e.g., prolonged entrapment) to either meet on scene or rendezvous en route as treatment of hypotension and tension pneumothorax can be life-saving procedures, both of which may cause cardiac arrest in the trauma patient.

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_2 sat between 94-99%.
3. Manage airway as appropriate, see Airway Algorithm, **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).

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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 18**.
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, see Hyperkalemia protocol, **Red 31**.

PEARLS for Crush Injury:

Treat suspension trauma as prolonged entrapment and follow crush injury protocols as above

Facial/Dental Injury

E A P

EMT/ADVANCED EMT/ PARAMEDIC

1. Administer oxygen, as appropriate, with a target of achieving 94-99% 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. Pinch nose continuously for 10 – 15 minutes, below nasal bones while having patient lean forward. May place a nasal clamp for hemorrhage, if so available.

5. **Nose/Ear Avulsion:**
   a. Recover tissue if doing so does not delay care.
   b. Transport with avulsed tissue wrapped in dry sterile gauze in a plastic bag placed on ice.
   c. Severe ear and nose lacerations can be covered with a moist sterile dressing.

A P

ADVANCED EMT/PARAMEDIC

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

P

PARAMEDIC

7. Pain medication as per Universal Pain Management protocol, **Green 18**.

Ophthalmology

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EMT

1. Assess eye. Never put pressure on an injured globe.
2. Assess gross visual acuity (e.g. count fingers).
3. For thermal exposure, assist patient with removal of contact lenses and apply cool saline gauze to both eyes.
4. For chemical exposure, assist patient with removal on contact lenses and flush eye(s) with sterile saline or clean water source continuously.
5. For direct eye trauma:
   a. Impaled object: secure object and patch both eyes. Keep patient supine.
   b. Puncture wounds: patch (vs. protective shields) both eyes and keep patient supine.
   c. Avulsion of globe: do NOT put back into socket. Cover with moist sterile dressings and then place cup over site.
   d. Other significant eye trauma: place eye shield.

A P

ADVANCED EMT/PARAMEDIC

6. For penetrating or blunt eye trauma, if patient experiences nausea, refer to Nausea and Vomiting protocol, **Gold 19**.

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PARAMEDIC

7. 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.
8. 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 rule out 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 clinician only and not provided to the patient for ongoing use

Open Fractures

Definition of Open Fracture: Suspected fracture with associated extensive tissue damage, wound, and/or visible bone; includes amputations.

E

EMT

1. Assess for other life threatening injuries and manage as indicated.
2. In patients who are otherwise stable, gross contamination (such as leaves or gravel) should be removed if possible.
3. Cover open fractures with moist, sterile dressing.
4. Splint the fractured extremity in the anatomic position if possible and the position of comfort if not able to splint in the anatomic position.
5. Consider pain control. Refer to Universal Pain Management protocol, **Green 18**.
6. Request ALS, if available, for additional pain control and consideration of antibiotics.

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ADVANCED EMT

7. Establish an IV.
8. Request ALS, if available, for additional pain control and consideration of antibiotics.

P

PARAMEDIC

9. Ceftriaxone, per dosing recommendations listed below:
   a. For patients 12 years and older: Ceftriaxone 2 grams IV in 50 -100 ml of NS or D5W over at least 10 minutes.
   b. For patients less than 12 years old:
   Ceftriaxone 75 mg/kg IV (max dose 2 grams) in 50 -100 ml of NS or D5W over 10 minutes.
   c. **NOTE**: ceftriaxone is CONTRAINDICATED in patients with history of allergy or anaphylaxis to penicillins or cephalosporins.
10. Notify receiving hospital if patients received antibiotics.
    a. If patient DID receive antibiotics, notify hospital WHEN antibiotics were initiated.
    b. If patient DID NOT receive antibiotics, notify hospital WHY antibiotics were withheld.

Pearls for Open Fractures

- Examples of Penicillins include: penicillin, amoxicillin, augmentin, piperacillin (Zosyn), ampicillin (Unasyn)
- Examples of Cephalosporins include: cefazolin (Ancef), Cefdinir, cefuroxime (Ceftin or Zinacef), cefadroxil (Duricef), cephalexin (Keflex). cefepime (Maxipime), ceftriaxone (Rocephin)
- Contact OLMC for questions regarding the patient's allergies

Strangulation

- Strangulation should be suspected anytime that someone has been assaulted and experienced either syncope, blunt neck trauma (e.g., "choking", being held down with an extremity to their neck, etc.), facial or chest injuries, hoarse voice, loss of hearing or vision, incontinence, etc.
- Patients who have suffered strangulation are at risk for airway compromise, vascular injury and stroke up to 72 hours after injury.
- Interpersonal violence scenes are high risk for EMS providers. Please see **Grey 24** regarding crime scene management.
- Many victims of strangulation have also suffered sexual assault, please see **Grey 18**, if applicable.

E A P

EMT/AEMT/PARAMEDIC

1. Have a high level of suspicion for additional injuries. See Trauma Triage Guidelines, **Green 1**.
2. In hangings, immobilize c-spine per Spine Assessment & Management protocol, **Green 3**.
3. In erotic asphyxiation, immobilize c-spine per Spine Assessment & Management protocol, **Green 3**.
4. Monitor for development of airway compromise with continuous pulse oximetry and frequent re-evaluations**.**
5. Manage airway per Airway Algorithm protocol, **Blue 3**.
6. For seizure, refer to Seizure protocol, **Gold 8**.
7. For neurological deficits/stroke symptoms, refer to Stroke protocol, **Gold 10 .**

PEARLS

- Patient who have suffered strangulation are at risk for airway compromise, vascular injury and stroke up to 72 hours after injury. These patients should be transported.
- Many victims of interpersonal violence decline transport or refuse medical evaluations for fear of retaliation, not wanting to disclose abuse, lack of childcare, etc. If you suspect strangulation, call OLMC to discuss refusals and options for alternative evaluations and referrals.
- Less than 5% of strangulation victims seek medical attention, which means EMS may be the only medical provider that ever evaluates this injury. If patient cannot be convinced to be transported, make sure to discuss signs and symptoms for which the patient should monitor (e.g., difficulty breathing, swallowing or speaking; hoarse voice; neck swelling; fainting; stroke symptoms).
- Attempt to maintain integrity of evidence at injury sites if it does not interfere with patient care. Up to 50% of strangulation victims have no obvious external injures (including those who die from their strangulation).

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_2, as appropriate.
2. Manage airway as needed, refer to Airway Algorithm, **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 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 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 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 are longer acting opioids (or formulated to be so), such as buprenorphine, methadone, and the fentanyl patch, and may require many repeated doses of naloxone which could exceed a total of 4 mg.

5. For suspected cyanide or CO poisoning, see Cyanide/CO Exposure protocol, **Yellow 8**
6. For hypoglycemia, see Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**.
7. For seizures, see Seizure protocol, **Gold 8**.
8. Obtain 12-lead ECG, if so trained.

ADVANCED EMT/PARAMEDIC

9. Establish IV access.
10. Alternative naloxone route of administration:
    a. Naloxone 0.1 - 2 mg I**V/IO/IM**; titrate to improved respiratory drive.
    b. Pediatric patients (excluding neonates): 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 improved respiratory drive.
11. Cardiac Monitor
12. If patient is hypotensive, administer a fluid bolus.

PARAMEDIC

13. For <u>absorbed toxins</u> resulting in pain, see Universal Pain Management protocol, **Green 18** and for analgesic for eye pain, see Ophthalmology protocol, **Green 25**.

(Continued)

Poisoning/Overdose #2

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14. Suggested Treatments:
    a. Symptomatic bradycardia (hypotension, altered mental status, syncope/pre-syncope, chest pain, dyspnea, acute heart failure, signs of shock, or cyanosis/pallor) due to beta- or calcium channel blocker overdose:
        i. **Adult**: Calcium gluconate 60 mg/kg **IV** over 5 minutes (MAX 3 gm/dose), may repeat every 10 min for up to 4 additional doses, as needed.
        ii. **Pediatric**: Calcium gluconate 60 mg/kg **IV** over 30 minutes (MAX 3 gm/dose), may repeat every 10 min for up to 4 additional doses, as needed.
        iii. Refer to Bradycardia protocol, **Red 25**.
    b. Dystonic reaction:
        i. **Adult:** Diphenhydramine 25-50 mg **IV/IM**
        ii. **Pediatric:** Diphenhydramine 1-2 mg/kg **IV/IM** (MAX dose 50 mg)
    c. Organophosphates: Nerve Agent/Organophosphate/Carbamate Poisoning protocol, **Yellow 7**
    d. Severe agitation: Hyperactive Delirium with Severe Agitation protocol, **Orange 5**
    e. Tricyclic Antidepressant (TCA)/sodium-channel blocker*** overdose with either hemodynamic instability or widened QRS complex on initial 12-lead ECG defined as:
        i. Tachycardia (Adult: heart rate greater than 100 bpm; Pediatric as defined by age, see **Pink 8**) **AND**,
            1. QRS greater than 120 msec**, OR**
            2. An increase in QRS of 10 msec over serial 12-lead ECGs (repeat every 10 min, if feasible).
        ii. Repeat 12-lead ECG after treatment and every 10 minutes (if feasible) if QRS is less than 120 msec, and every 5 minutes (if feasible) if QRS is greater than 120 msec. Treat as follows:
            1. Sodium bicarbonate:
                a. **Adult**: 1 mEq/kg with a MAX of 100 mEq **IV push** over 1 minute. May repeat as needed with goal of QRS complex less than 120 msec. MAX of three doses.
                b. **Pediatric**: 1 mEq/kg with a Max of 100 mEq **IV push** over 1 minute. May repeat as needed with goal of QRS complex less than 120 msec. MAX of three doses. (8.4% sodium bicarbonate must be diluted 1:1 with D5W to 4.2% [0.5 mEq/mL] prior to administration in patients less than 2 years of age)
            2. Fluid bolus for hypotension
            3. 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** - Usual starting dose of NOREPInephrine is 0.03 mcg/kg/min. Clinical circumstances may require a slightly higher starting dose of 0.06 - 0.09 mcg/kg/min. **Titrate** by 0.03 mcg/kg/min every 3 minutes to meet desired clinical effect, which may include appropriate SBP:
                i. **Adult** systolic greater than 90 mmHg and/or MAP greater than 65.
                ii. For **pediatric** VS, please see **Pink 8**.
                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.

(Continued)

Poisoning/Overdose #3

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4. Refer to Seizure protocol, **Gold 8,** for TCA-induced seizure activity
5. Consider magnesium sulfate for arrhythmia that does not respond to sodium bicarbonate.
   a. **Adult**: 2 grams of magnesium sulfate **IV/IO** over 10 minutes
   b. **Pediatric**: 25-50 mg/kg **IV/IO** (diluted to 20% or 2 gm/10 mL) infusion over 10 minutes (MAX dose 2 grams).
6. 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. **Do not** give naloxone to a patient who is in cardiac arrest. This practice is not helpful and may be harmful as it distracts from the best performance of tasks that are necessary for the successful resuscitation of cardiac arrest. Refer to the 2019 Naloxone White Paper for more information.
- 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. Refer to Naloxone Dispensation protocol, **Yellow 4**.

For tricyclic antidepressant/sodium-channel blocker toxicity:

- The most common drugs requiring boluses of sodium bicarbonate are as follows:
  - For **adults**, TCAs
  - For **pediatrics**, antihistamines, though it is not common to get to the point of administering sodium bicarbonate for pediatric patients.
- ***There are several classes of medications that can cause sodium channel blockade when taken in an overdose, causing QRS prolongation and requiring sodium bicarbonate administration. The classes of these medications (with some examples) are listed below:
  - Antidepressants (amitriptyline, nortriptyline, imipramine, doxepin)
  - Antiarrhythmics (quinine/quinidine, propafenone, flecainide)
  - Anesthetics (cocaine, lidocaine, bupivacaine)
  - Muscle Relaxants (cyclobenzaprine)
  - Antihistamines (diphenhydramine)
- Gather as much detailed information about the drug as possible and monitor the QRS as per protocol.
- Sodium bicarbonate increases extracellular sodium, thereby overcoming sodium channel blockade of the tricyclic antidepressant and other sodium-channel blocking medications. 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.

Naloxone Dispensation

E A P

Amendments to Maine Law in 2021 allow EMS clinicians in the state of Maine to distribute naloxone to patients who are treated for opioid overdose, but refuse transport to the hospital. This protocol establishes the conditions for naloxone distribution (i.e., Naloxone "Leave Behind" Program).

EMT/AEMT/PARAMEDIC

If a patient treated for opioid overdose refuses transport to the hospital, and the patient has decision making capacity (defined by Maine EMS Transport protocol, **Grey 21**):

1. Distribute one (1) Maine EMS approved naloxone kit for future use to either the patient, for the patient, their family or friends to use in the case of suspected opioid overdose, document per training.
2. Perform point of care training for use of the kit as described in Maine EMS naloxone distribution training.
3. In addition to the naloxone kit and point of care training, please also provide a list of local substance use disorder resources (e.g. OPTIONS program).
4. Document refusal of transport.

PEARLS

- Maine has disproportionately been affected by the national opioid epidemic. In an effort to address opioid overdoses, Maine EMS has worked with the legislation to create pathways for distribution of naloxone in the instance a patient is treated for opioid overdose in the pre-hospital environment AND refuses transport.
- Please recognize, this protocol is specific to opiate use disorder AND the patient MUST meet the criteria for decision making capacity as described in the Maine EMS **Transport Protocol, Grey 21**. For patients WITHOUT decision making capacity, please follow the steps in **Grey 21.**
- The 130th Maine Legislature passed LD 1333, "An Act Concerning the Controlled Substances Prescription Monitoring Program and the Dispensing of Naloxone Hydrochloride by Emergency Medical Services Providers" which authorizes the practice of EMS clinicians leaving a medication with a non-transported patient for future use. Please recognize, this practice is authorized for naloxone ONLY.

Alcohol Intoxication/Severe Alcohol Withdrawal #1

E

EMT

1. Assess ABCs.
2. Obtain vital signs.
3. Assess level of consciousness. Consider alternative diagnosis. Refer to Altered Level of Consciousness protocol, **Gold 5**.
4. If trained, perform finger stick blood glucose.
   a. If blood glucose less than **60 mg/dL** or clinical condition suggests hypoglycemia, request ALS and refer to Diabetic/Hypoglycemic protocol, **Gold 6**
5. **In Acute Alcohol Intoxication** - If the patient has evidence of incapacitating intoxication or acute illness/injury, request ALS.
6. **With any concern for withdrawal** - Question the patient about past withdrawal symptoms. Any patient with a history of hospitalization for alcohol withdrawal, withdrawal seizures, or delirium tremens (DTs) should be transported to the Emergency Department.
7. In either **Acute Alcohol Intoxication** or concern for **Alcohol Withdrawal,** ask the patient about the time and amount of their most recent alcohol ingestion, frequency and amount of routine alcohol use, and any co-ingestion such as ethylene glycol (found in antifreeze), ethyl alcohol (ethanol, grain alcohol), methanol (wood alcohol), or other substances.
8. If the patient refuses transport, refer to the Transport protocol, **Grey 22**.

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ADVANCED EMT

9. In either **Acute Alcohol Intoxication** or concern for **Alcohol Withdrawal** - for patients requiring transport, consider IV access and fluid bolus if clinically indicated.

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PARAMEDIC

10. For **Severe Alcohol Withdrawal** symptoms, contact OLMC for the option of midazolam 2.5 mg **IV** or 5 mg **IM**. May repeat x 1 with MAX cumulative dose of 5 mg **IV** or 10 mg **IM.**

   a. **Severe Alcohol Withdrawal** symptoms include hypertension/tachycardia AND **two or more** of the following:
      i. *Severe tremors*, test by "arms extended and fingers spread apart" or if tremors are noted continuously while at rest
      ii. *Drenching sweats*
      iii. *Continuous tactile disturbances* - ask "Have you had any itching, pins and needles sensation, any burning, any numbness, or do you feel bugs crawling on or under your skin?"
      iv. *Continuous auditory disturbances* - ask "Are you more aware of sounds around you? Are they harsh? Do they frighten you? Are you hearing anything that is disturbing to you? Are you hearing things you know are not there?"
      v. *Continuous visual disturbances* - ask "Does the light appear to be too bright? Is its color different? Does it hurt your eyes? Are you seeing anything that is disturbing to you? Are you seeing things you know are not there?"

11. If seizure, refer to Seizure protocol, **Gold 8**.

Alcohol Intoxication/Severe Alcohol Withdrawal #2

PEARLS

Intoxicated patients with any of the following **MUST** be transported to the Emergency Department:

1) **Incapacitating Intoxication:** inability to maintain airway; inability to stand from seated position and ambulate with minimal assistance; at immediate risk of environmental exposure or trauma due to unsafe location.
2) **Acute Illness/Injury:** abnormal vital signs, physical complaint that may indicate underlying illness/trauma, seizure, hypoglycemia, trauma, head injury.

Delirium tremens (DTs) is a severe form of alcohol withdrawal that can be life-threatening if not treated properly. DTs usually begin 48 hours after last alcohol consumption and is most severe 4-5 days after last alcohol consumption. Typical duration of DTs is 2-3 days but can last up to 8 days. Untreated DTs has a mortality rate of 37%. In contrast, hospitalized patients with DTs have a mortality rate of 1-4%.

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-Bs** (**B**radycardia, **B**ronchorrhea, **B**ronchospasm).
- If you suspect a bioterrorism/WMD threat, see **Grey 30**.
- Transport patients with all windows of ambulance open.
- Decontaminate entire ambulance after patient transport.
- All responders who contacted the patient require decontamination.

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In unstable patients with known nerve agent/organophosphate/carbamate poisoning:

EMT

1. Remove patient from contaminated area and consider decontamination as needed based on scene/call circumstances.
2. O_2 as appropriate.
3. Manage airway as appropriate, see Airway Algorithm, **Blue 3**.
   Ventilatory support may be critical in these poisonings
4. Vigorous suctioning may be necessary.
5. Request ALS.
6. Administer 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	**EMR/EMT/AEMT/Paramedic** - 1 **pediatric** atropine auto-injector **IM** or **Paramedic -** atropine 0.2 mg **IV/IO*, AND** midazolam 0.2 mg/kg **IM** (MAX dose 10 mg) or 0.1 mg/kg **IV/IO** (MAX dose 5 mg) **	
Pediatric 1 year or older	**EMR/EMT/AEMT/Paramedic** - 1 **adult** atropine auto-injector **IM** or **Paramedic -** atropine 2 mg **IV/IO*, AND** midazolam 0.2 mg/kg **IM** (MAX dose 10 mg) or 0.1 mg/kg **IV/IO** (MAX dose 5 mg) **	
Adult	**EMR/EMT/AEMT/Paramedic** - 1 atropine auto-injector **IM** or **Paramedic -** atropine 2 mg **IV/IO* AND** midazolam 10 mg **IM** or 5 mg **IV/IO ** **	**EMR/EMT/AEMT/Paramedic** - 3 atropine auto-injectors **IM** or **Paramedic -** atropine 5 mg **IV/IO* AND** midazolam 10 mg **IM** or 5 mg **IV/IO** **

* Monitor and repeat dose every 5 minutes if patient remains symptomatic; if atropine is drawn up from a vial to administer **(Paramedic),** the concentration may require more than one injection site to achieve the full dose without exceeding the recommended 3-5 mL max IM volume in adults and 0.5-2 mL max IM volume in peds.

** 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

Assessment
Vital Signs
Evidence of Major Trauma
Major Burns, Inhalation Injury

→ Proceed to Appropriate Trauma or Airway Management protocol

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

Mild Exposure
Transient neuro changes
GCS 14 or 15
No cardiovascular symptoms

→ Do Step 1

Moderate Exposure
Ongoing neuro changes
Confusion
GCS 8-13
+/- Chest Pain/SOB

→ Do Step 1 and 2

Paramedic: If antidote considered, contact OLMC

Severe Exposure
Severe confusion/Coma
GCS < 8
+Hypotension (<90 mmHg)
Apnea/Cardiac Arrest

→ Do Step 1, 2,and 3

Treatments

Step 1
EMT/AEMT/Paramedic
1. Administer high flow O_2
2. Pulse Ox may be inaccurate in exposure to CO/CN or methemoglobinemia

AEMT/P
3. Monitor rhythm

Step 2
EMT/AEMT/Paramedic
1. Manage Airway as appropriate, see **Blue 3**
2. 12-lead ECG, if trained

AEMT/Paramedic
3. Collect rainbow blood sample tubes per local protocol
4. If hypotensive, administer IV bolus, may repeat x 1

Step 3
Paramedic
In case of CN toxicity, either alone or in combination with CO exposure:
1. **Adult**: Hydroxocobalamin (Cyanokit) - 5 g **IV**. May repeat x 1 for partial response

2. **Peds:** Hydroxocobalamin (Cyanokit) - 70 mg/kg **IV**, 2.5 g for weight less than 30 kg

Known or Suspected Cyanide/CO Exposure #2

PEARLS

- 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 COHb (carboxyhemoglobin) level and ETCO2 (waveform capnography).
- Carbon monoxide (CO) and Hydrogen cyanide (CN) 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 (CN), 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 CN gas.

Radiation Injuries

E

EMT

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. Four hours after exposure, re-evaluation can be delayed 24-72 hours, tag patient **"Yellow**".
5. Treat traumatic injuries per appropriate protocol (**Green Section**).
6. Consider pain management per Universal Pain Management protocol, **Green 18**.
7 Use water-repellent dressings to cover wounds to prevent cross contamination.
8. Consider transport only after appropriate decontamination

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AEMT

9. Consider anti-emetic per Nausea and Vomiting protocol, **Gold 19**.
10. Document the time the GI symptoms started.

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PARAMEDIC

11. 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 clinicians.
- 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.

Severe Hypothermia WITH Signs of Life

E

Classification	Core Temp	Clinical Presentation
Normal	>95° F / 35° C	**Cold sensation/shivering**
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	**</= 90° F/32° C: Shivering stops** **</=86° F/30° C: AMS**
Severe	≤ 82° F ≤ 28° C ≤ 77° F ≤ 24° C	Rigidity, vital signs reduced/absent. Severe risk of V-fib with mechanical stimulation (rough handling) Spontaneous V-fib cardiac arrest

Bold indicates major thresholds between stages.
Adapted from "State of Alaska Cold Injuries Guidelines" 2014

Treatment

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 packs (heat packs cannot exceed 113°F); if available, may use hospital-grade electric forced air re-warmers.
3. Consider warmed AND humidified 100% O_2.
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.
7. Apply clean dressing to frostbitten extremities and between involved fingers and toes.

A P

ADVANCED EMT/ PARAMEDIC

8. Consider 1000 mL (20 mL/kg for **pediatrics**) bolus of NS heated to 104 - 108° F (40 - 42° C).

9. Contact OLMC for additional boluses.

Severe Hypothermia WITHOUT Signs of Life

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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 3** 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).

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

A P

ADVANCED EMT/PARAMEDIC

5. Consider 1000 mL (20 mL/ kg for **pediatrics**) bolus of NS heated to 104 - 108° F (40 - 42° C).

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6. Contact OLMC for additional boluses.

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7. Otherwise, treat as per normothermic cardiac arrest management for the patient's dysrhythmia, refer to Adult **(Red 8)** or Pediatric **(Red 17)** Cardiac Arrest protocol.

PEARL

- Do not massage extremities in attempt to actively re-warm the patient; massaging the extremities will not significantly increase body temperature and it may worsen the damage caused by frostbite.
- Moderate-to-severe frostbite is defined as:
  - Frostbite involving hands, feet, face, or genitals,
  - Frostbite associated with cyanotic tissue, blisters (clear or hemorrhagic) or skin necrosis,
  - Frostbite associated with loss of sensation or weakness in the involved area.
- Follow your local trauma system transport destination protocols in cases of moderate-to-severe frostbite.
- Circum-rescue hemodynamic collapse can occur in these patients. The drop in catecholamines and mental relaxation that occurs just before, during, or after rescue may lead to life-threatening hypotension or arrhythmia (i.e. ventricular fibrillation).

Hyperthermia - Heat Exhaustion

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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 condition/color 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.

A P

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 condition/color 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.

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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 or below 102° F (38.8° C).

A P

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 clinicians, i.e. sports medicine clinicians or athletic trainers prior to the start of the event to ensure that necessary equipment is available.

Drowning/Submersion Injuries

E

EMT

1. If C-spine injury suspected, manage C-spine per Spine Assessment & Management protocol, **Green 3**.
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 Severe Hypothermia protocols, **Yellow 11 & 12**.
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.
9. Consider CPAP to supplement the patient's own respiratory effort.
10. If needed, refer to Anxiolysis in CPAP protocol, **Blue 10**.

A P

ADVANCED EMT/PARAMEDIC

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).
- Circum-rescue hemodynamic collapse can occur in these patients. The drop in catecholamines and mental relaxation that occurs just before, during, or after rescue may lead to life-threatening hypotension or arrhythmia (i.e. ventricular fibrillation).
- 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

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 1 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 clinicians. 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?

E A P

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.

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3. Contact OLMC for assistance if the parent/guardian refuses medical care and/or transport. 

Pediatric Respiratory Distress with Inspiratory Stridor

E A

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_2, if available and as appropriate, with upright posture
2. If needed, assist ventilations with PPV using 100% O_2.
3. Request ALS, if available.

P

PARAMEDIC

4. Dexamethasone 0.6 mg/kg **PO/IV/IM/IO** x 1 (MAX dose 16 mg)
5. For signs of moderate to severe croup, administer inhalation of **nebulized** solution of 1 mL 1mg/mL EPINEPHrine OR 0.5 mL racemic epinephrine mixed with 2.5 mL normal saline solution*. Signs of moderate/severe croup include stridor at rest AND one of the following: tachypnea, moderate intercostal retractions (including suprasternal retractions), agitation/restlessness/tired appearing, difficulty talking or feeding.

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6. Contact OLMC for the second dose of nebulized EPINEPHrine if symptoms do not improve, and consider alternate diagnosis such as aspiration of foreign body, bacterial tracheitis, or epiglottitis.

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* 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*. 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.

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).

E A P

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, inter-activeness, consolability, gaze, cry)
   b. Work of breathing (abnormal noises or position, retractions, flaring)
   c. Circulation (pallor, mottling, cyanosis)
   d. 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.

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5. Contact OLMC for assistance if the caregiver/guardian refuses medical care and/or transport.

E A P

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 or right 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. Immediately place baby skin-to-skin with the mother, unless resuscitation is required. Dry and stimulate the baby, examine and keep warm, next to mother's skin, covering mother and baby with warm blankets or aluminum foil blankets (e.g."space blankets"). As soon as possible, enable child to nurse at mother's breast. In a stable newborn, remain on scene, as conditions permit for a minimum of 15 minutes to allow for skin-to-skin contact.
   d. Assess APGAR SCORE at 1 and 5 minutes, refer to APGAR Score, **Pink 6**.
   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 prior to EMS arrival, start at #5b above.
8. **PARAMEDIC only**: After delivery of fetus and placenta, administer oxytocin 10 units **IM** to the **mother**. Note: If known multiple fetuses, do not give oxytocin until all placentas are delivered.

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9. During transport, the baby should be placed in an appropriate child passenger restraint system with the head supported. Maintain warmth during transport.
10. Maintain warmth during transport. Hypothermia in the newborn may cause decreased LOC, hypoglycemia, bradycardia and hypotension. Wrap the baby in warm blankets or aluminum foil blankets (e.g."space blankets") and a warming hat to minimize heat loss. Consider using a Maine EMS approved infant warming pad during transport. For premature infants, wrap the torso and extremities of the baby in food-grade or medical-grade plastic wrap.
11. ***Monitor the baby's airway during transport.***

E A P

(Continued)

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12. Most deliveries proceed without complications. If complications of delivery occur, the following steps are recommended:
    a. **Shoulder dystocia** – if delivery fails to progress after head delivers, quickly attempt the following:
        i. Hyperflex mother's hips to severe supine knee-chest position,
        ii. Apply firm suprapubic pressure to attempt to dislodge shoulder,
        iii. Apply high-flow oxygen to mother,
        iv. Transport as soon as possible,
        v. Contact closest appropriate receiving facility.
    b. **Prolapsed umbilical cord**
        i. Placed gloved hand into vagina and gently lift head/body off of cord,
            1. Maintain until relieved by hospital staff.
        ii. Consider placing mother in prone knee-chest position or extreme Trendelenburg,
        iii. Apply high-flow oxygen to mother,
        iv. Transport as soon as possible,
        v. Contact closest appropriate receiving facility.
    c. **Breech birth** - presentation of buttocks or extremity first,
        i. Place mother supine, allow the buttocks and trunk to deliver spontaneously, then support the body while the head is delivered.
        ii. If head fails to deliver within 30 seconds of the legs, place 2 fingers of a gloved hand into vagina to locate the infant's mouth. Press the vaginal wall away from the infant's mouth to maintain the infant's airway,
        iii. Apply high-flow oxygen to mother,
        iv. The presentation of an arm or leg through the vagina is an indication for immediate transport to hospital,
        v. Assess for presence of prolapsed cord and treat as above,
        vi. Transport as soon as possible,
        vii. Contact closest appropriate receiving facility.
    d. **Excessive bleeding** during active labor may occur with placenta previa.
        i. Obtain history from the patient.
        ii. Placenta previa may prevent delivery of infant vaginally.
        iii. C-Section is needed – transport urgently.
        iv. Contact closest appropriate receiving facility.
    e. **Maternal cardiac arrest**
        i. Apply manual pressure to displace uterus from right to left,
        ii. Treat per **Red 8**, Adult Cardiac Arrest protocol - defibrillation and medications should be given for same indications and doses as if non-pregnant patient,
        iii. Contact **OLMC** to discuss rapid transport if infant is estimated to be over 24 weeks gestation.
            1. Perimortem Cesarean section at receiving facility is most successful if done within 5 minutes of maternal cardiac arrest.
13. **If any of the above conditions are present, the patient is best cared for at a hospital with Obstetric (OB) services. If the patient condition permits, transport to the nearest hospital with OB capabilities if total transport time is less than 45 minutes, otherwise go to the closest ED. For questions, contact OLMC.**

E A P

APGAR Score

Assess the baby at 1 minute and again at 5 minutes.

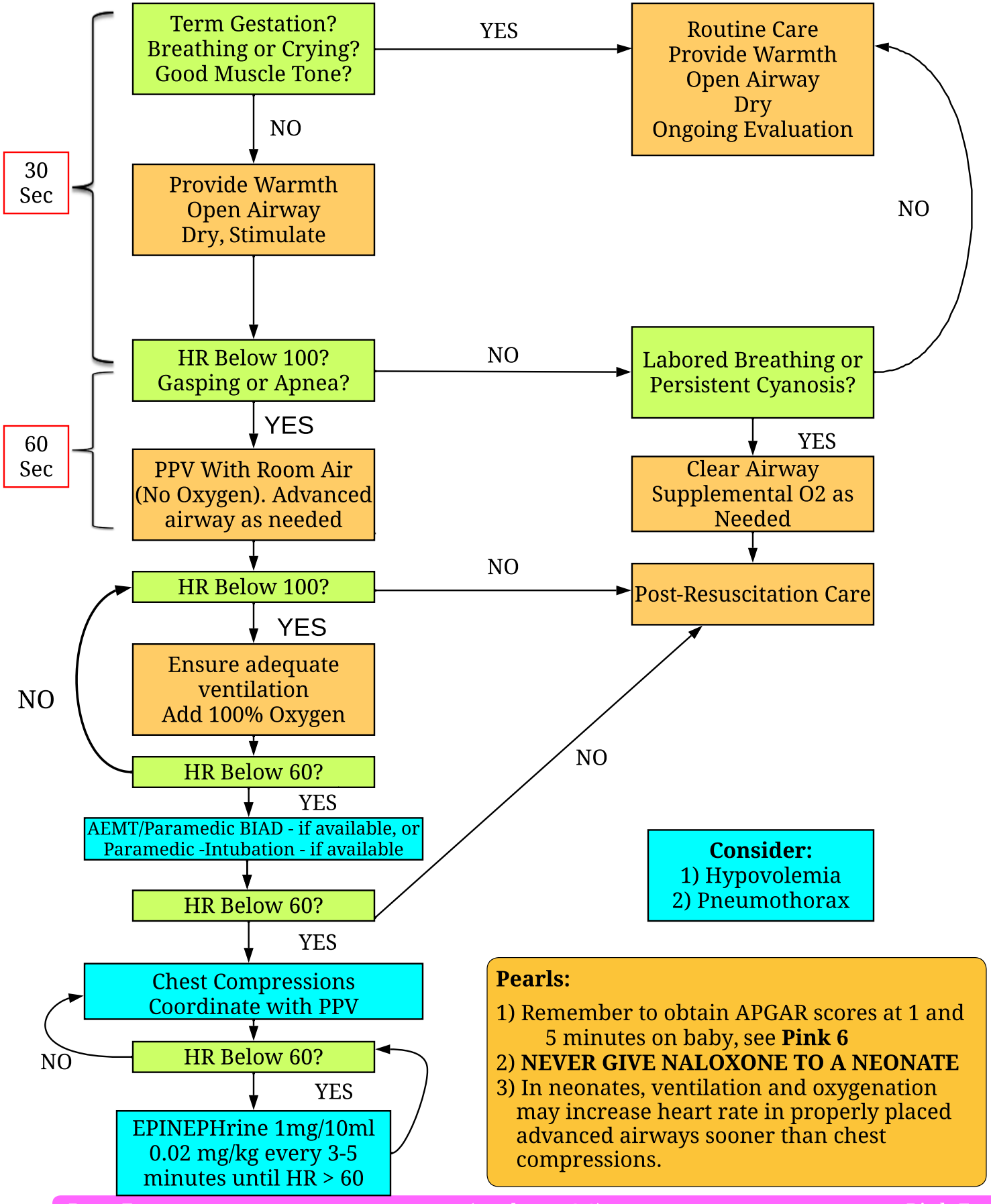
DO NOT DELAY RESUSCITATION to obtain APGAR Score.

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 (less than 29 days old)



Pearls:

1) Remember to obtain APGAR scores at 1 and 5 minutes on baby, see **Pink 6**
2) **NEVER GIVE NALOXONE TO A NEONATE**
3) In neonates, ventilation and oxygenation may increase heart rate in properly placed advanced airways sooner than chest compressions.

Normal Pediatric Vital Signs, # 1

Normal Pediatric Vital Signs					
Age	Approximate Weight (kg)	Pulse/Min	Resp/Min	Minimum Systolic BP	Glucose (mg/dl)
Newborn	3	100-160	30-60	60	45-120
6 months	7	100-160	30-60	70	100-180
1 year	10	100-140	24-40	70	
2 years	12	80-130	24-40	70	
3	15	80-130	24-40	Multiply age x 2 and add 70	
4	16	80-120	22-34		
5	18	80-120	22-34		
6-7	20	70-110	18-30		80-140
8-9	25	70-110	18-30		80-140
10-11	35	60-100	16-24		70-120
12-13	40	60-100	16-24		
14	50	60-100	16-24		
15	55+	60-100	14-20		

Note: Estimated weight in kilograms: [2 x (age in years)] + 8
* Typical Systolic BP in children 1-10 years of age: 90 + (age in years x 2)
* Lower Limits of Systolic BP for a child age 3-15 years: 70 + (age in years x 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	Bougie	Bougie
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, #1

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.

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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 clinician 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 clinician seat / captain's chair as this is dangerous and may lead to significant injuries.

E A P

Transport of Mentally Ill Patients #1

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. Recognizing that altered level of consciousness can mimic mental illness, especially in the prehospital setting, personnel should perform a thorough medical evaluation referring to Altered Level of Consciousness protocol, **Gold 5,** prior to attributing behavior to mental illness. Refer to the Hyperactive Delirium with Agitated Behavior protocol, **Orange 5**.

All diagnostic and therapeutic interventions administered by EMS clinicians 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. Clinicians are cautioned to use physical restraint as a last resort, preferably with the assistance of local law enforcement, refer to the Restraints protocol, **Orange 4**. 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. As with any patient sign-off situation, the patient must meet safe criteria for discharge from EMS transport, refer to Transport protocol, **Grey 22**. In these nuanced situations, EMS clinicians are encouraged to discuss with OLMC at the originating facility prior to signing off the patient.

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.*

Transport of Mentally Ill Patients #2

Pediatric behavioral health emergencies are increasing in frequency throughout the United States. EMS clinicians should be compassionate to the special needs and considerations of this population, especially in times of crisis. Establishing rapport with the the patient, speaking at eye level, and using a non-threatening physical posture should be emphasized when de-escalating these calls. The clinician will often find it helpful to engage the parents/guardians in the evaluation and transport decision.

Depression/Suicidal Ideation

E A P

1. Ensure the scene is safe and request law enforcement for patients actively threatening/attempting suicide.
2. Assess the patient: has suicide attempt or self-harm occurred? If yes, evaluate for need of medical treatment (e.g. ingestion) or traumatic injuries (e.g., cutting, strangulation) and refer to appropriate protocol. If needed, call for ALS.
3. Establish rapport with the patient by listening carefully and speaking in a non-confrontational manner.
4. Assess the patient's risk for depression and suicidal ideation.
   a. **SAD PERSONS** Scale (report score to receiving hospital):
      1 point for each of the following
      - **S**ex: male
      - **A**ge <20 or >44
      - **D**epression
      - **P**revious suicide attempt
      - **E**thanol abuse
      - **R**ational thinking loss
      - **S**ocial supports lacking
      - **O**rganized suicide plan
      - **N**o spouse (divorced, widowed, single)
      - **S**ickness (chronic, debilitating, or severe)

   b. 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. Record or collect items such as toxic substances, alcohol, drugs and medications that may have been taken and transport with patient to the hospital, if appropriate. Items may also be collected by law enforcement, if appropriate. Refer to Poisoning/Overdose protocol, **Yellow 1** for any ingestion.
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 **Orange 1** for Transport of Mentally Ill Patients protocol
Refer to **Orange 4** for Restraint protocol
Refer to **Orange 5** for Hyperactive Delirium with Severe Agitation 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.**

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. Clinicians 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.

E A

EMT/AEMT

1. Refer to Altered Level of Consciousness Protocol, **Gold 5**, to establish etiology of agitation.
2. Request law enforcement assistance.
3. Request ALS.
4. Attempt de-escalation techniques (speak in an honest, non-confrontational tone while avoiding eye contact).
5. Have appropriate personnel available prior to initiating restraints.
6. 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.
7. Never place objects on top of patients to restrain them.
8. Restrained patients require 1:1 observation by EMS personnel and require continuous cardiac, pulse oximetry and waveform capnography monitoring, if able to do so.
9. Contact **OLMC** as soon as logistically possible after securing the safety of the patient and clinicians.

10. Documentation: Document de-escalation techniques utilized prior to physical restraint. Document type of restraints used, how restraints applied, when restraints applied, why restraints applied (e.g., 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.
11. Restraint devices applied by a law enforcement officer (LEO) require an officer's presence to ensure patient safety and to allow for quick removal, if medically necessary. In most cases, the LEO should accompany the patient in the ambulance. However, if the LEO requests, and there is no active safety concern to the EMS Clinician, it is permissive for the LEO to immediately follow the ambulance in their vehicle to the hospital.
12. Restrained patients should not be moved in a stair chair device as violent patients cannot be properly restrained in a stair chair and EMS personnel may be easily thrown off-balance by a resisting patient.
13. Restrained patients should be transported to the nearest emergency department.

P

PARAMEDIC

14. Refer to Hyperactive Delirium with Severe Agitation protocol, **Orange 5**. Physical restraint is both physically and mentally traumatizing to patients. If the patient remains agitated after physical restraint, and verbal de-escalation is unsuccessful, pharmacologic management is strongly recommended.

Pearls for Restraints

In conjunction with and support of a joint statement released in October 2020 by the NAEMSP, NASEMSO, NEMSMA, NAEMT and APA, the MDPB strongly supports regular, continuing education focused on the management of behavioral emergencies, implementation of QA/QI processes dedicated to these situations, and fostering local relationships with key stakeholders that encourage local systems of care to support EMS clinicians caring for patients suffering from behavioral emergencies.

Hyperactive Delirium with Severe Agitation #1

E A

P

EMT/ADVANCED 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.
4. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6.**
5. These symptoms may be caused by a number of intoxicants including, but not limited to, alcohol, sympathomimetics (e.g., cocaine, methamphetamine, MDMA), and dissociative agents (e.g., PCP, LSD, dextromethorphan, K2/Spice, Bath Salts, DMT). **Early contact of OLMC is essential for proper preparation of the receiving facility and staff.**

PARAMEDIC

6. 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	-2 to -4

(Continued)

Hyperactive Delirium with Severe Agitation #2

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PARAMEDIC

7. If Altered Mental Status Score +1, +2 or +3, consider midazolam 4-10 mg **IM** for patient/EMS clinician 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**:
   a. *Midazolam for patient/EMS clinician safety and patient comfort. The first dose should be based on patient's size, age, and the circumstances causing the agitation:
      i. **Adult -** midazolam 4-10 mg **IM**

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      ii. **Pediatric (10 years or older)** - midazolam 0.1 mg/kg **IM**, MAX single dose of 10 mg
         1. For children less than 10 yo, **OLMC** must be contacted **prior** to administration

-OR-

   b. **Ketamine
      i. **Adult** - ketamine 4 mg/kg **IM**
         1. may <u>not</u> be used in patients greater than 65 years old

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      ii. **Pediatric** - ketamine 4 mg/kg **IM** .
         1. For children less than 10 yo, **OLMC** must be contacted **prior** to administration

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9. Monitor and document the following every 5 minutes - ECG, O_2 sat, $ETCO_2$, AMSS, and vital signs

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10. Contact **OLMC** for dosing questions or if patient requires repeat dosing

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Pearls for Hyperactive Delirium with Severe Agitation

Agitation - is defined by excessive, purposeless cognitive and motor activity or restlessness, usually associated with a state of tension or anxiety. **Hyperactive Delirium with Severe Agitation** is a sub-category of agitation, with a potential for higher morbidity and mortality. 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

Hyperactive Delirium with Severe Agitation #3

Pearls

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

Pearls for Midazolam/Ketamine

*** Midazolam**

- Patients with underlying medical conditions (including COPD/CHF/CAD) as well as patients older than 60 years are more likely to suffer adverse effects from midazolam. Consider lower doses in this population.
- WARNING: May cause respiratory depression, apnea or arrest.
- Assess patients for signs and symptoms of respiratory depression and sedation.
- Administration: **IM** - Administer undiluted deep IM into large muscle.
- Concomitant use with opioids: **[US Boxed Warning]:** Concomitant use of benzodiazepines and opioids may result in profound sedation, respiratory depression, coma, and death.

****Ketamine**

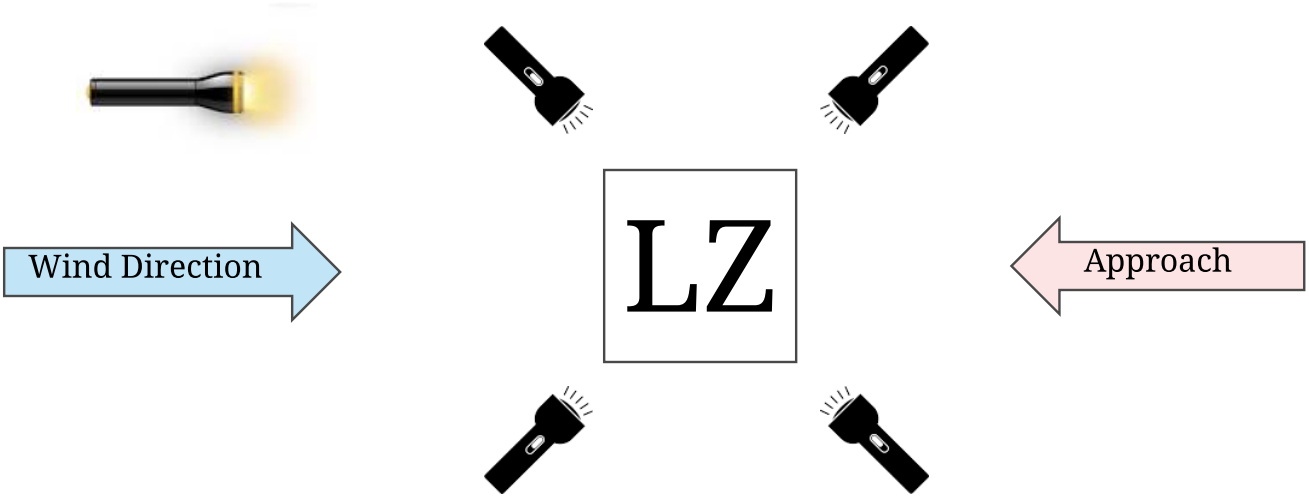
- Document the patient's Altered Mental Status Score (AMSS) in the run report.
- Patients with an AMSS less than 4 may be more likely to require airway management when receiving Ketamine, therefore Ketamine is to be used ONLY if the patient is suffering from Hyperactive Delirium with Severe Agitation, 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.

E A P

EMT/ADVANCED EMT/PARAMEDIC

1. Approach patient in a non-threatening manner and establish rapport.
2. Patient may be wearing several layers of clothes. Avoid cutting clothes, if possible, as these may be the only clothes the patient has, however do not allow clothes to prevent a full examination of the patient. Be aware of the presence of sharp objects (i.e. syringes, knives, weapons, etc.) in pockets and clothing.
3. Be cognizant of patient possessions and attempt to secure patient belongings with a trusted individual if it is not feasible to transport all belongings.
4. Homeless patients are at risk of exposure to environmental elements. Move the patient to a "safe" environment (i.e. ambulance) early in the encounter, if feasible.
   a. Once the patient is physically in a private and safe location, consider inquiring about the patient's safety from physical or verbal threats.
5. Be aware of concurrent illnesses that may influence the chief complaint. Homeless individuals may lack access to routine medical care predisposing them to the risk for both chronic and acute illnesses.
   a. For example, the pregnancy rate of homeless women is estimated to be twice that of the general population.
6. Mental illness and substance abuse occur frequently in the homeless population. Avoid attributing the current chief complaint to these underlying conditions.
7. Head injuries are common in the homeless population. For patient with altered mental status, refer to Altered Level of Consciousness protocol, **Gold 5** or Head Injury protocol, **Green 8**.
8. Individuals suffering homelessness may have many barriers that limit their interest in transport to a hospital. Should the patient refuse transport, refer to the Transport Protocol, **Grey 22** and consider discussing with OLMC.

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 appoint personnel to guard main and tail rotors (i.e. Rotor Officer) as per current ground safety course
- 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 ■ 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 ■ 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

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 15**).

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. Devices, such as jewelry, must have the patient's name clearly displayed and must indicate the patient's wishes to be DNR. If there are no specific instructions beyond "DNR", follow Maine EMS Comfort Care/DNR Guidelines, **Grey 4.**

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 . 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 4.**

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 to EMS personnel.

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Do Not Resuscitate (DNR) Guidelines #2

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III. Treatment/Comfort Care

A. When treating a patient with a Maine EMS Comfort Care/DNR Order or DNR Directive, the responding EMS clinician 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.

B. 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

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IV. Revocation, Documentation & When to Stop Resuscitation

A. 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.

B. 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 clinicians should keep the original EMS Comfort Care/DNR Order Form, wallet card, plastic bracelet, DNR Directive form or DNR jewelry with the patient.

C. 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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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 12**).
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.

D. Management of Patient Remains

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 patient's body. Contact your local ED with regard to tissue donation options and procedures in advance.
Refer to Death Situations for Emergency Responders protocol, **Grey 11.**

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Do Not Resuscitate (DNR) Guidelines #5

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Pearls for DNR Guidelines: A living will or a Durable Power of Attorney for Healthcare (DPOAH) form may or may not contain a DNR order or instructions for end-of-life decisions. A patient's spouse or other person may have the authority as a surrogate to make a decision to withhold or withdraw life-sustaining treatment for a patient under certain circumstances. If it's unclear whether a DNR order or instructions for end-of-life decisions exist, or it's unclear whether a person who is requesting that resuscitation be withheld has the authority to do so, initiate resuscitation and contact OLMC for guidance.

When a written DNR order is not available but the patient has a DPOAH and the patient's healthcare agent requests that resuscitation be withheld, contact OLMC for guidance.

Living Will:
A Living Will is intended to address patients who have been admitted to a healthcare facility. Living Wills rarely, if ever, have application in the prehospital environment.

POLST (Provider Orders for Life-Sustaining Treatment):
POLST Section A
The POLST constitutes a DNR if "No CPR" is indicated in this section.Otherwise, if the patient has indicated they do not want resuscitation but does not have a separate valid DNR order, contact Medical Control for guidance.

POLST Section B
When confronted with a seriously ill patient who has a POLST form (green form) and is not in cardiac arrest :

- If "Full Treatment" box is checked: Use all appropriate measures to stabilize/resuscitate patient.
- If "Selective Treatments" box is checked: The maximum respiratory interventions include interventions such as non-rebreather mask, CPAP, and suctioning. All appropriate IV medications may be utilized. Avoid intensive care: ventilator, cardioversion, defibrillation. Transfer to hospital if needs cannot be met in current location.
- If "Comfort-Focused Treatments" box is checked: Limit respiratory interventions to non-rebreather mask, suctioning and treatment of airway obstruction, as needed. Medications to relieve pain or discomfort may be utilized. Transfer to hospital only if comfort cannot be achieved in current setting.

POLST Section C
Refers to IV therapy for hydration, nutrition, and other orders. Advanced EMTs and Paramedics may start an IV for the purpose of medication administration outlined in Section B.

Pre-Hospital Management of Hospice Patients, #1

EMS may be called to respond to patients on Hospice Care. This may occur because the patient (or family) was unable to reach a Hospice nurse/physician or the patient (or family) became anxious. In these circumstances, **EMS clinicians should make every effort to reach a Hospice Provider** and should remain with the patient until the Hospice Provider arrives. Comforting interventions (**Grey 4**) should be undertaken. Support family members.

EMS clinicians should avoid the following interventions:

- Sirens, lights or aggressive interventions.
- IV therapy (except where other forms of medication administration are not possible). Discuss options with patient, family, caregivers.
- Cardiac resuscitation: CPR, resuscitation medications, BVM ventilations.
- Cardiac pacing, cardioversion, and defibrillation.
- Hospice patients should not be transported to the hospital except where transport is specifically requested by the patient or his/her healthcare agent or surrogate, and preferably only after consultation with the hospice team and exhaustion of other treatment pathways that do not require transport to the hospital.

If the reason for calling 9-1-1 is unrelated to the Hospice patient's terminal illness, the appropriate protocol should be followed and the patient should be transported to the hospital, if needed and requested by the patient or surrogate (example: laceration requiring sutures).

OLMC should be consulted, as needed, to discuss Hospice Provider orders and other concerns.

- Many hospice patients will have a hospice comfort kit that contains medications that patient's caregivers are instructed to use to treat commonly encountered medical issues.

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Pre-Hospital Management of Hospice Patients, #2

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E

EMT
Routine Patient Care.
1) Contact the hospice team (preferred) or OLMC to coordinate care and determine administration of hospice kit medications.
2) Consider paramedic response for medication administration.

3) Breakthrough Pain: Suggest administration of breakthrough pain medication by patient / families. For pain of sudden onset, seek to determine and treat the underlying cause (e.g., pathological fracture).
4) Anxiety: Consider potential causes for patient's anxiety, such as increased pain and shortness of breath. Suggest administration of medication by patients/families.
5) Dyspnea: Administer oxygen, as appropriate, to relieve shortness of breath and achieve a respiration rate of < 20. Use a fan to blow air directly at the patient's face.
6) Constipation: Suggest administration of constipation medication by patient/family.
7) Terminal Dehydration: Moisten lips with petroleum jelly; use artificial saliva/mouth sponges and ice chips.
8) Confusion/Delirium: Speak slowly and calmly to the person. Remind the patient of where they are, and who you are. Avoid contradicting the patient's statements. Ensure a patient's hearing aid and glasses are available. Limit activity/noise in the room.

A

Advanced EMT
9) Nausea/Vomiting: Suggest administration of nausea medication or refer to Nausea/Vomiting protocol, **Gold 19**.

Paramedic

10) Consider following written orders for medications in hospice kit. As an adjunct, consider:
    a) For Breakthrough Pain, refer to Universal Pain Management Protocol, **Green 18**.
    b) For Anxiety, contact OLMC for Ketamine 0.5 mg/kg IN for a max dose of 25 mg.
    c) For Bronchospasm, refer to Respiratory Distress with Bronchospasm protocol, **Blue 7**.

P

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PEARLS
Breakthrough Pain assessment and management is important in patients with advanced disease as they may have a high burden of pain, be opiate tolerant, and already be receiving high doses of opioids.

Anxiety ranges from mild to severe, is common in patients nearing death, and should be treated promptly.

Terminal secretions are noisy, gurgling respirations caused by secretions accumulating in the lungs or oropharynx.

Terminal dyspnea is exhibited by patients that are expected to die within hours to days. Individuals experiencing dyspnea often experience heightened anxiety.

Constipation is a frequent cause of nausea and vomiting. Opioid-related constipation is dose-related, and patients do not develop tolerance to this side effect.

Nausea / Vomiting can be extremely debilitating symptoms at the end of life. Effective control of nausea can be achieved in most patients.

Fever and Infection treatment should be guided by an understanding of where the patient is in the dying trajectory and the patient's specific goals of care.

Overwhelming sepsis may be a sign of active death not to be reversed.

Delirium is common at end of life and is often caused by a combination of medications, dehydration, infections or hypoxia. It is distressing to families. It often heralds the end of life and may require active sedation.

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. Notify 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.

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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 EMS clinician 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.

Maine Death with Dignity Law

PEARLS
Death with Dignity Law (Sec. 1. 22 MRSA c. 418): The Maine Death with Dignity Act provides eligible Maine residents with terminal, incurable diseases that will, within reasonable medical judgment, result in death within six months, the option to be prescribed a dose of medication that, if taken, will hasten the end of their life.

Patients should have a either a form that identifies their participation in the Maine Death with Dignity Program or a DNR/POLST form.

It is possible that Maine EMS personnel may be called to respond to an individual who has voluntarily entered into an agreement with his/her Attending physician to end their life under the Death with Dignity Act.

If dispatched to such a patient, and questions arise regarding patient care, please contact OLMC.

Bariatric Patients

E A P

This protocol provides guidance for the triage, extrication, care and transport of bariatric patients. A bariatric patient exceeds 180 kg (400 lbs.) or possesses a body habitus that challenges the ability of a two-person crew to manage effectively. On scene time may be prolonged for bariatric patients who may require additional resources, personnel and equipment to safely evaluate, manage and transport. Goals include the timely and effective management of these patients while maintaining patient privacy, dignity and comfort.

EMT/Advanced EMT/Paramedic:

- Equipment: deploy specialized equipment/personnel per local/regional policy.
- Request a Bariatric ambulance, if feasible, and if time allows.
- Bariatric stretchers are preferred for patient comfort.Ensure that the weight limit of the utilized stretcher exceeds the weight of the patient.
- Request additional personnel resources for the extrication process
- Clinicians should be knowledgeable about the utilization of bariatric equipment prior to using it.
- Early pre-hospital notification is required as special arrangements may be needed at the receiving hospital.

- Consider the patient's immediate needs (CT scan, surgery, cardiac catheterization, etc.) when determining hospital destination. If the patient is stable and there exists a potential requirement for alternate destination, please contact OLMC for guidance and discussion regarding the most appropriate patient destination.
- If not present, request ALS (Paramedic), especially in situations in which on-scene time will be prolonged.

PEARLS

- It may be difficult to establish IV and IO access. Consider intramuscular or intranasal as alternatives for some medications. For IM, ensure that the needle used is sufficiently long.
- Weight-based calculations may yield inappropriately large doses in obese patients. Consult with medical control when in doubt regarding medication dosing. In addition, medication par levels may be exceeded when using weight-based dosing.
- Bariatric patients often have decreased functional residual capacity, and are at risk of rapid desaturation. Extremely obese individuals require more oxygen than non-obese individuals due to their diminished lung capacity. Pulse oximetry may not be reliable due to poor circulation. Even patients without respiratory distress may not tolerate the supine position.
- Bariatric patients may present with severe airway challenges. Carefully plan your approach to the airway and be prepared with backup airway plans.
- If the patient has had recent bariatric surgery, possible complications may include anemia, dehydration, internal leakage at the surgical site, ulcers, localized infection, sepsis, etc.

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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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.

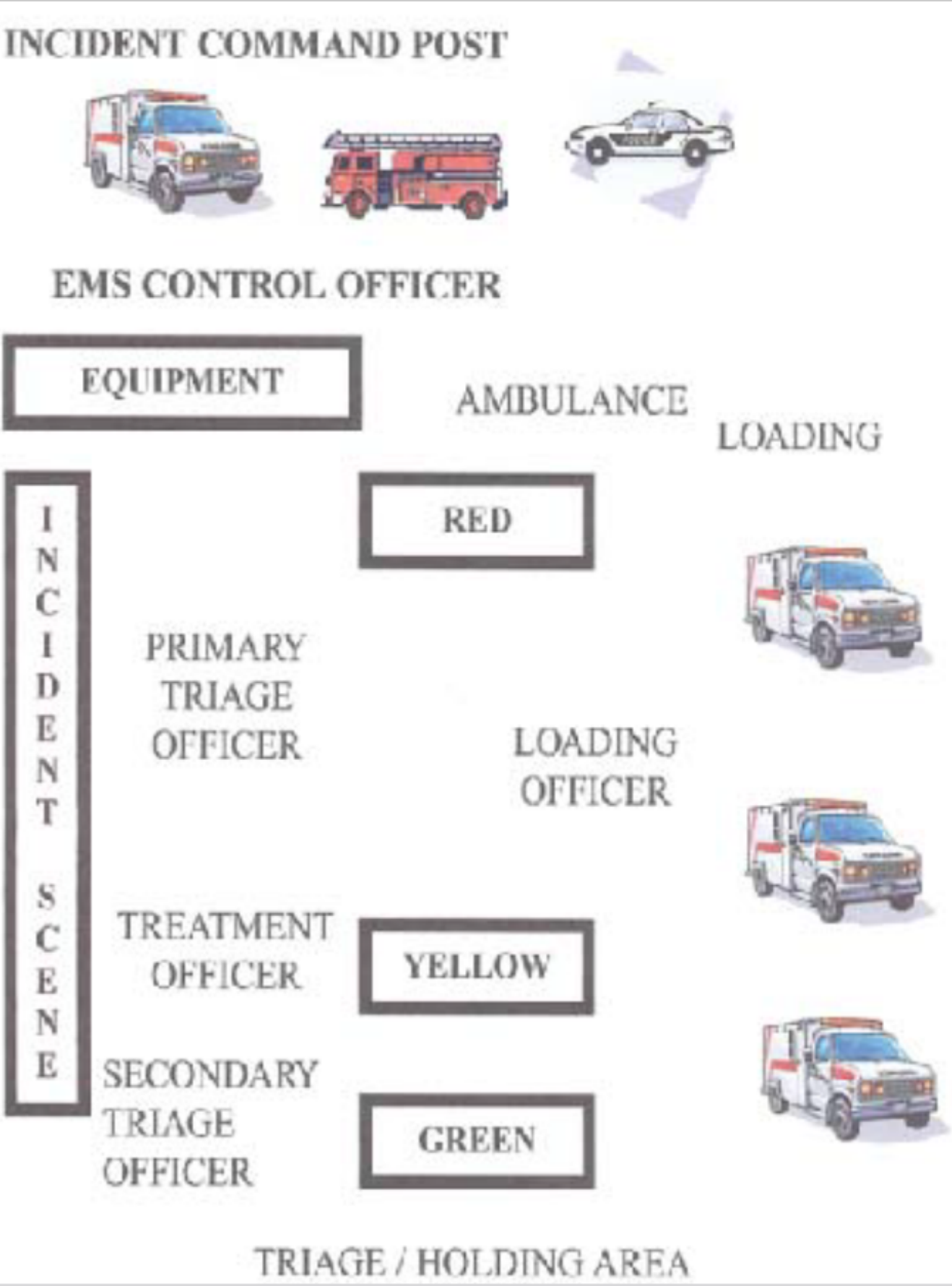
BLACK (O): Are obviously dead, or dying from lethal injuries, or requiring CPR when no personnel are available to do so without compromising other patients.

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 clinicians 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)



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 clinician as the primary clinician. If the assault is a same sex assault, then a clinician of the opposite sex may be more comfortable for the patient.
10. To maintain privacy and confidentiality, use a phone 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 MRS, Chapter 1071, Subsection 4011-A)

All levels

- Child abuse and child neglect are sufficiently widespread to guarantee that virtually every EMS clinician 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 clinician are physical abuse and severe physical neglect, although sexual abuse may, on occasion, be observed.
- The EMS clinician 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 clinician, 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 clinician to speak alone with the child
6. Vague, inconsistent, or changing history
7. Refer to appropriate protocol for the child with altered level of consciousness, **Gold 5**, the child in shock, **Gold 14**, or the child in cardiac arrest, **Red 1**7

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.

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4. EMS clinicians 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 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 MRS, Chapter 1071, Subsection 4014

AN ACT TO STRENGTHEN THE LAWS GOVERNING MANDATORY REPORTING OF CHILD ABUSE OR NEGLECT.
(Title 22 MRS 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 MRS 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
(Title 22 MRS, 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)

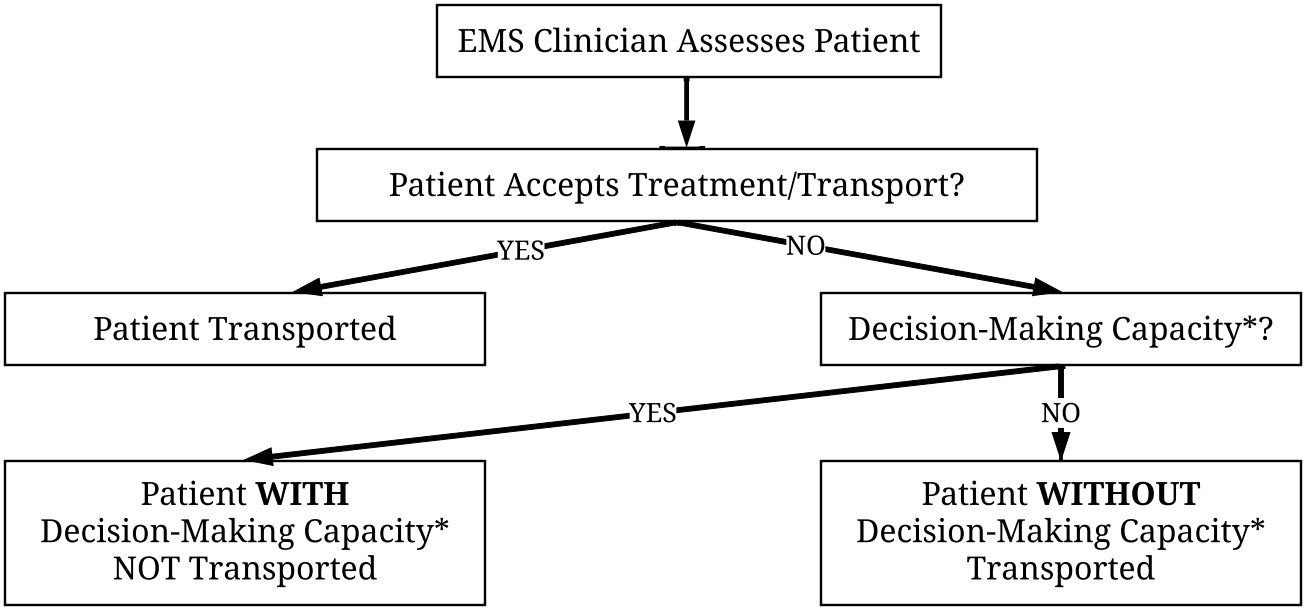
§ 2405 (1) “Persons who may report if, while acting in a professional capacity a…emergency medical services person…knows or has reasonable cause to believe that a person has been operating a motor vehicle, hunting or operating a snowmobile, all-terrain vehicle or watercraft while under the influence 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. Additionally, a patient who demonstrates a suicidal/self harm gesture or admission, either verbally or in writing, shall be considered to be WITHOUT decision-making capacity.

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 EMS clinician 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.

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Transport Protocol #2

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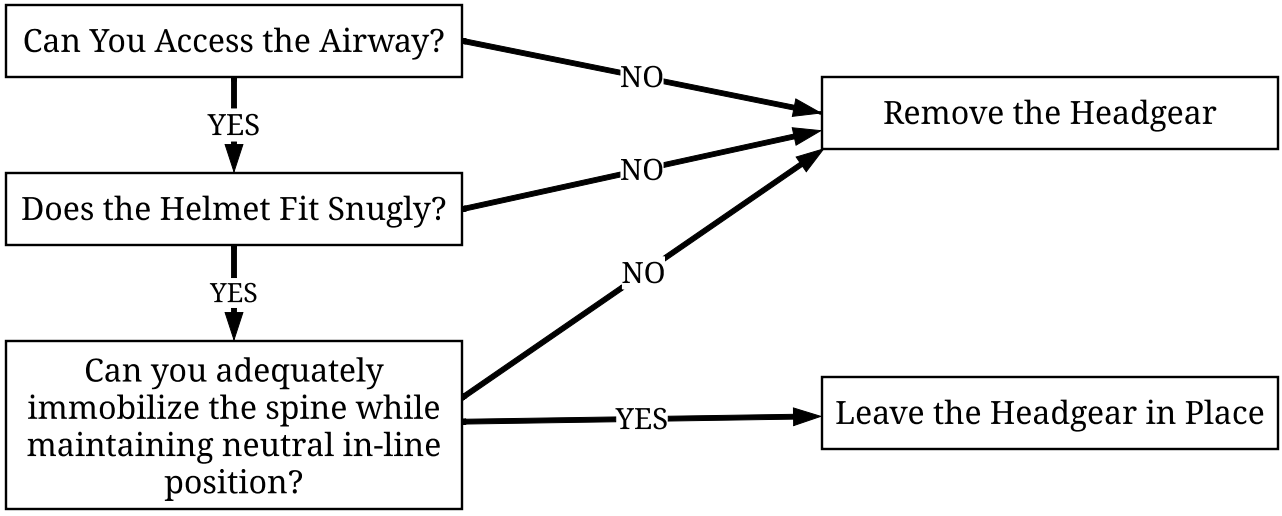
7. In some circumstances, patient transport is requested by an off site medical clinician. Should a patient refuse transport and be found to have decision making capacity, EMS clinicians should communicate the discovery of decision making capacity and the patient's right to refuse transfer with invested 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.

Protective Headgear Removal

The decision to remove protective headgear from an injured patient rests with the EMS clinician 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 clinician 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:



Crime Scenes

DO NOT enter an active shooter scene, or a scene in which an unsecured weapon is involved, until the scene is secured by law enforcement, unless trained and authorized to do so (such as in the context of a tactical response team or rescue task force). If encountering a possible crime scene and not previously dispatched, contact law enforcement.

Once a crime scene is deemed safe by law enforcement, initiate patient contact and medical care, if necessary.

- Do not sacrifice patient care to preserve evidence.
- Have all EMS clinicians use the same path of entry and exit, if feasible.
- Do not touch or move anything at a crime scene unless it is necessary to do so for patient care (notify law enforcement prior to moving, if possible).
- Do not walk through fluids.
- Observe and document original location of items moved by crew whenever possible.
- Do not sacrifice patient care to preserve clothing, but when possible and removing patient clothing is required, leave it as intact as possible. Avoid cutting through holes made by weapons, if possible.
- If you remove any items from the scene, such as impaled objects or medication bottles, document your actions and advise a law enforcement official (prior to removal, if feasible).
- Consider requesting a law enforcement officer to accompany the patient in the ambulance to the hospital.
- Document statements made by the patient or bystanders on the EMS patient care report. Report significant information to a law enforcement official prior to leaving the scene, if feasible.
- Comments made by a patient or bystanders should be denoted in quotation marks.
- Inform staff at the receiving hospital that this is a “crime scene” patient.
- If the patient is obviously dead, consistent with Do Not Resuscitate Guidelines, **Grey 3**, notify law enforcement of decision not to initiate resuscitation/patient care.
- At motor vehicle incidents, preserve the scene by not driving over debris, not moving debris and parking away from tire marks, if feasible.
- Prior to leaving a crime scene, if feasible, check the bottom of your shoes for contamination (fluids, objects, etc.). Notify law enforcement for removal of any evidence and possible photographing of your shoes.

Defibrillation/Cardioversion Settings

DEFIBRILLATION SETTINGS*

	Initial	Second	Third	Fourth	Subsequent
Adult	Per device recommendations* If unknown, use maximum		Maximum available energy		
Pediatric	2 J/kg	4 J/kg	6 J/kg	8 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.

EMT/AEMT/Paramedic

Maine Safe Haven Laws: In Maine, a person may voluntarily deliver their baby not more than 31 days old to any safe haven provider with intent not to take back the newborn. The term “safe haven provider” as defined in 22 M.R.S. § 4018(1)(B) refers to a law enforcement officer; staff at a medical emergency room; a medical services provider (which includes Emergency Medical Services person); a hospital staff member at a hospital, or a fire fighter.

Procedure:

1. Examine baby and refer to appropriate protocol(s) if treatment is needed. Transport to nearest hospital that accepts emergency patients.
2. Inform person surrendering baby that information shared is protected under the above law and utilized in the welfare of the child. Information may include:
   a. Date of birth of baby
   b. Circumstances related to pregnancy/delivery
   c. Any information about Native American heritage (Indian Child Welfare Act of 1978)
   d. Any medical/genetic information relating to baby, parents, extended family
   e. History of substance abuse by either parent
   f. Physician or midwife who delivered infant (if known)
   g. Any information that person surrendering infant is willing to provide (parent(s) names(s), addresses, family members
3. Provide accepting hospital with all information gathered at the time of surrender.
4. Notify the Department of Health and Human Services of the delivery of the child, the hospital the child was transferred and delivered to, and all information provided by the individual surrendering the child.
5. Complete a Maine EMS Run Report to include the information obtained
   a. Date and time of surrender
   b. Physical Exam and treatment
   c. Gender

EAP

EMS clinicians are mandated to report incidents of child abuse/neglect to Child Protective Services (1-800-452-1999). Refer to **Grey 19, Child Abuse Management and reporting Protocol.**

Safe Response and Transport

1. Transporting services should develop response and transport (lights and siren) policies approved by the service medical director and developed in compliance with state law (Maine Statute 29-A-2054) and Maine EMS.
2. Utilization and appropriateness of lights and sirens should be included in service QA/I plans
3. All EMS crashes and near misses should be reviewed at the service level with involvement of the service medical director
4. Drivers of ambulances should partake in training programs and continuing education in addition to required certifications
5. Consider road and weather conditions when determining response priority and transport.
6. Consider flow of traffic transport in situations when EMS clinicians may not be properly restrained (e.g. CPR). Ideally, CPR should NOT be performed in a moving ambulance.
7. Reserve lights and sirens when transporting time sensitive conditions (MI, stroke, multi-trauma, etc.)
8. Secure all objects when an ambulance is in motion.
9. Utilize all patient safety restraints (lap and shoulder belts on stretcher)
10. EMS clinicians should utilize safety restraints at all times unless this significantly impacts patient care. When clinician safety restraints need to be removed, consider timing and road conditions and notify driver that clinician restraints are not in use.
11. Non-EMS clinicians should be properly restrained at all times.

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
Acetaminophen IV
Adenosine
Albuterol
Amiodarone
Aspirin
Atropine
Calcium Gluconate
Ceftriaxone
Cyanide poisoning kit contents
Dexamethasone
Dextrose (D_{10}, D_{50})
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 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
Oxytocin
Ondansetron IV and ODT
Racemic EPINEPHrine nebulized
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 Fax: (207)287-6251
e-mail: maine.ems@maine.gov www.maine.gov/ems

State EMS Director: Wil O'Neal
State Medical Director: Matthew Sholl, M.D., MPH
State Associate Medical Director: Kate Zimmerman, D.O.
Maine EMS Offices:

- Education
- Licensing and Investigations
- Data
- Systems of Care
- EMS for Children
- Substance Use Disorder (SUD) Programming
- Community Paramedicine
- Connect ME
- Emergency Medical Dispatch

Region 1 – York & Cumberland Counties
Medical Director: Kelly Meehan-Coussee, M.D.

Region 2 – Androscoggin, Franklin, Kennebec, Oxford, Sagadahoc, & Somerset Counties
Medical Director: Seth Ritter, M.D.
Medical Director: Tim Pieh, M.D.

Region 3 - Hancock, Knox, Lincoln, Penobscot, Piscataquis, Waldo, & Washington Counties
Medical Director: Benjy Lowry, M.D.
Medical Director: David Saquet, D.O.

Region 4 - Aroostook County
Medical Director: Beth Collamore, M.D.

Telephone/Radio Reference/Contact Numbers #2

Maine ACEP Representative
Kelly Meehan-Coussee, M.D.

At-Large Representative
Peter Tilney, D.O.

Clinical Pharmacist/Pharmacology Representative
Bethany Nash, PharmD, AEMT

ALS Representative
Colin Ayer, EMT-P

BLS Representative
Emily Wells, PharmD, AEMT

Pediatric Representative/EMS-C Medical Director
Rachel Williams, M.D.

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	1-800-821-5821
Maine National Guard 11th Civil Support Team (WMD)	207-877-9623
Maine Emergency Management Agency	207-624-4400

To Report Workplace Injury:	
Bureau of Labor	
Business Hours	207-623-7923
Evenings & Weekends	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 Health Maine Medical Center Portland 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

State and Regional EMS Offices

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

Non-EMS System Medical Interveners

Thank you for your offer of assistance.

Please be advised that these Emergency Medical Services clinicians are operating under the authority of the State of Maine and under protocols approved by the State of Maine. These EMS clinicians 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 EMS clinician, **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 EMS clinicians 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 EMS clinicians 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 clinicians 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"

ANNEX

The following protocols require specialty training.
These protocols are not part of the standard prehospital patient care protocols.

Operational K9 Protocols Intro

The Medical Direction and Practices Board recognizes that EMS clinicians may work with Operational K9s [OpK9] as part of their job (with search and rescue or law enforcement teams). While the handler of the canine is ultimately responsible for their dog, they may grant permission to trained EMS personnel to provide care for their canine partner.

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

At no time should the care of an OpK9 take priority over a person. It is vital that the EMS personnel have a working relationship with the OpK9 handler(s) well in advance of needing to implement these protocols.

MRS Title 14, Chapter 7, subsection 164-B, *Immunity from civil liability for assistance given to law enforcement dogs, search and rescue dogs and service dogs (2017)*, and *An act to authorize the provision of emergency medical treatment for certain dogs* (2024), MRS Title 32, Chapter 85, subsection 9; MRS Title 32, Chapter 88, subsection 1 paragraph A, provides protections for emergency medical services clinicians who render aid to a working dog. Please refer to statutes for details.

At this time, these protocols do **NOT** apply to service dogs. Service dogs are defined by the ADA as a dog specifically trained to perform work for a person with a disability. Examples include guide dogs, medic alert dogs, and emotional support/psychiatric service dogs.

It is expected that clinicians maintain clinical competency and attend continuing education courses pertaining to the care of the Operational K9.

Denotes a potentially complex canine patient. Please consult the veterinarian to collaborate your efforts

Operational K9 Restraint #1

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

The goal is to *safely* provide the canine's initial medical evaluation, treatment and transport to definitive care. Injured and ill canines may pose an unintentional threat to clinicians, therefore it is imperative that the canine be secured prior to medical evaluation. This is best done by the canine's handler. It is preferable that the handler stay with their canine throughout all phases of care, evacuation, and transport unless they, themselves, are injured or required for threat neutralization. If the primary handler is not available, attempt to locate another handler or person that is familiar with handling OpK9s to secure and stay with the injured canine.

All injured canines should be muzzled before handling. The following are relative contraindications to muzzling:

1. Unconsciousness
2. Upper airway obstruction
3. Vomiting
4. Severe facial trauma
5. Heat-related injury (need to allow evaporative cooling via panting). If these canines need to be muzzled, a Cage- or Basket-type muzzle is preferred.

E A P

EMT/AEMT/PARAMEDIC

Muzzling

1. The type of muzzle used depends on the size of the of canine, available material, type of injury and desired canine access.

Muzzle Type	Required Materials	Suggested Use
Cage or Basket	Manufactured cage/basket muzzle (preferably made out of rubber)	~All-purpose ~Preferred muzzle: allows for open-mouth breathing ~Suggested if oxygen delivery is indicated
Fabric	Manufactured, pre-sized muzzle	All-purpose
Quick muzzle	Any available, broad-width (greater than 1-2 inches) tape, leash, webbing, gauze, etc.	~Use only if fabric or cage/basket muzzle is unavailable ~Narrow tape/gauze etc. can cause injury

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2. The canine should be restrained in a position of comfort, which may include sitting or standing. Do not restrain the canine in such a manner that its ability to breathe or pant is impeded.
3. Slide the appropriately-sized muzzle over the canine's snout from the rostral (anterior) to caudal (posterior) aspect. Be sure that the lower jaw is captured in the muzzle and not free.
4. Be sure to frequently check the security of the muzzle and make sure that it is not impeding the canine's ability to breathe.

****It is important that the clinician be adequately trained to restrain the Operational K9 in order to safely apply a muzzle. A stressed canine may not only bite the EMS clinician or others, but may bite its handler as well.****

E A P

Operational K9 Airway Obstruction #1

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

Clinical signs of airway obstruction include the following:

- **Gagging**
- **Pawing at the mouth**
- **Excessive drooling**
- **Frequent swallowing motions**
- **Extension of the head and neck**
- **Tripod position**
- **Reluctance to lie down**
- **Cyanosis (late sign)**

Similar to a person who can speak clearly without any respiratory distress, consider a canine that is barking, growling, or whining without any clinical signs of respiratory distress to have a patent airway.

E A P

EMT/AEMT/PARAMEDIC

1. Allow for position of comfort (sit or stand, sternal helps with gravity)
2. Secure canine with leash/rope
3. **Avoid** putting hands in canine's mouth (serious injury to clinician can occur)
4. Attempt Heimlich maneuver (avoid if sharp object involved)
    a. "Bear hug"or lay canine on side and place fist just below sternum or behind ribs
    b. Five (5) quick and upward abdominal thrusts followed by airway check
    c. If not successful, repeat 1-2 times
5. Palpate throat/trachea - you may be able to dislodge a supraglottic foreign body cephalad out of the pharynx.
    a. Palpate the object at the supraglottic region (ventral mandible)
    b. From caudal aspect of object, squeeze/push cranially
        i. Two-handed with both thumbs, or
        ii. Single-handed with thumb and index or middle finger

Pharyngo-laryngeal manipulation

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Operational K9 Airway Obstruction #2

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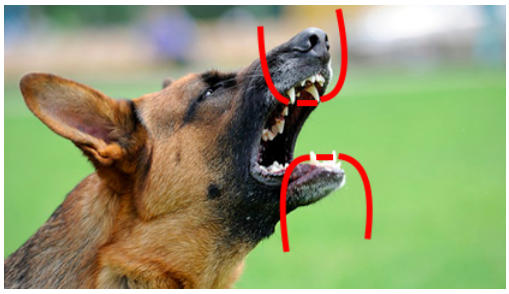
6. In an **unconscious** canine, open the airway by extending the head and neck, and pull the tongue forward. A second rescuer may use gauze/leash looped behind upper canine teeth to keep the mouth open. You may use a second length of gauze/leash for the lower jaw as well.



7. In an **unconscious** canine, if the obstruction is:
    a. **VISIBLE**: attempt to manually remove; do not push foreign body further back in airway
    b. **NOT VISIBLE**: do **not** attempt a blind finger sweep due to risk of pushing the foreign body further down the airway
8. If object is not removed and canine collapses, provide chest compressions and mouth-to-snout or BVM (with a canine mask). If unable to get chest rise, proceed to Airway Management protocol, **OD Green 6** and Cardiac Arrest protocol, **OD Green 10.**

E A P

Operational K9 Airway Management #1

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

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EMT/AEMT

1. Place the canine in the sternal (prone) position
2. Open airway
   a. Tilt head and slightly extend the neck
   b. If foreign body suspected, refer to Airway Obstruction protocol, **OD Green 4.**
3. Provide oxygen to maintain SpO_2 > 94%*
4. BVM (with canine mask) with goal respiratory rate of 10-12 breaths/minute

P

PARAMEDIC

5. If unable to ventilate with basic airway maneuvers, proceed with intubation (only if canine is **unconscious**)
   a. **Prepare**
      __Suction
      __Light source (flashlight/headlamp/laryngoscope)
      __ET tube ready with lubricant, bougie and syringe
         Measure ETT from incisor to thoracic inlet (typical ETT size is 9-11 mm)
            __Tube-securing device ready
      __Continuous end-tidal CO_2 monitor ready if available
      __Consider surgical airway device as back-up
   b. **Pre-oxygenate** (If time allows, often the collapse is sudden, not allowing adequate time to pre-oxygenate)
      __Pre-oxygenate with face mask x 3 minutes
      __Ensure SpO_2 greater than 90%
   c. **Position**
      __Sternal/prone position
      __Assistant to help open mouth
         __Second rescuer may use gauze/leash and place behind upper canines to hold mouth/airway open.
   d. **Pass the tube**
      __Pull tongue straight out and over mandible
      __Visualize vocal cords
      __Directly visualize ETT passing through cords
      __Inflate cuff
   e. **Check tube placement**
      __Breath sounds/chest rise
      __End-tidal CO_2, if available (35-45 mmHg)
   f. **Secure ETT**
      __Consider using a mouth-gag to keep mouth open and prevent damage to the ETT. This can be achieved with a 1-2 wide inch roll of tape
   g. **Titrate oxygen** to maintain SpO_2 ~ 94%

6. If unable to intubate or ventilate with BVM, proceed to Surgical Airway, protocol **OD Green 8**

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*Pulse oximetry is most reliable in unconscious, sedated, or anesthetized canines. Finger probes used for people do not work well in canines. If possible, obtain and use a flat ear probe attachment. Place the probe on the tongue or non-pigmented portion of the lip. In conscious dogs, use the ear pinna, lip fold, inguinal skin fold or prepuce/vulva; although not optimal for oximetry, these alternate sites generally yield reliable results in most instances. Alternatively , a neonatal or disposable pulse oximetry adhesive sensor attached to the base of the canine's tail provides an alternative and very reliable site.

Operational K9 Surgical Airway #1

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

Indication: Inability to oxygenate or ventilate via less invasive means (i.e. Basic airway maneuvers, and inability to intubate.)

Materials/Equipment for Surgical Cricothyrotomy

1. Cuffed tracheostomy tube or 6.0 - 10.0 ETT (dogs ~25 kg can accept a 9.0 mm tube)
2. Tracheal hook or bougie
3. Trousseau dilator (if available)
4. Syringe to inflate cuff
5. Scalpel (No. 11 blade)
6. Umbilical tape or other means to secure tracheostomy tube or ETT
7. 4x4 gauze
8. Suction, if available

Procedure:

1. Extend the neck when possible to ensure best access to the trachea.
   a. Place a towel, IV bag or similar item under the neck to help extension. Swab/cleanse the area.

2. Stabilize the larynx and locate the cricothyroid membrane
   a. Immobilize the trachea with your non-dominant thumb and middle finger while palpating the cricothyroid membrane with your non-dominant index finger. It is best to start palpation over the trachea and move cephalad to locate the membrane. NOTE: The cricothyroid membrane is immediately ABOVE the cricoid cartilage and 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.

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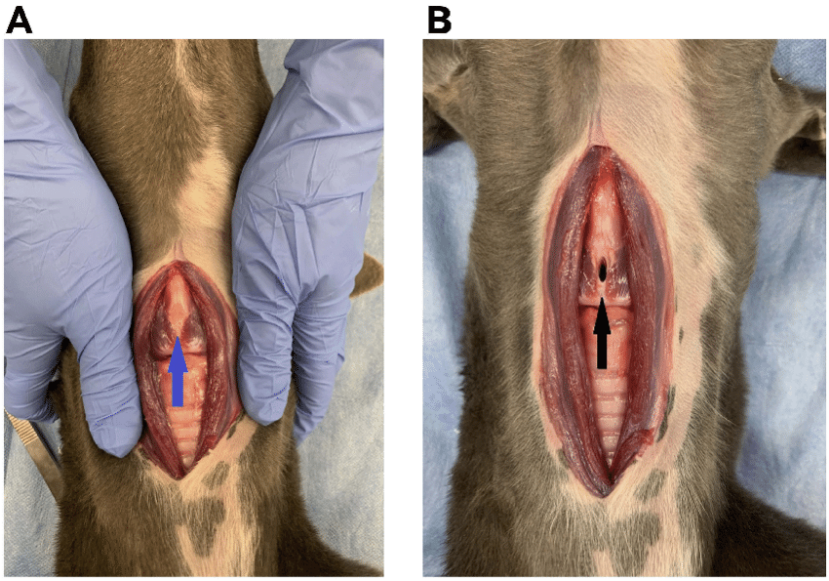
Procedure (continued from previous page)

6. Insert the tracheal hook or bougie in the opening of the membrane 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 and advance caudally. 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 $ETCO_2$.
12. Secure the tube in place.

Photos compliments of: Sureiyan Hardjo, UQVETS Small Animal Hospital

P



Dissection depicting the ventral laryngeal anatomy in a cadaver dog. (**A**) Blue arrow points to intact cricothyroid membrane and ligament. (**B**) Black arrow indicates the incision in the cricothyroid ligament. The cricothyroid membrane is located on the ventral aspect of the larynx, joining the caudoventral border of the thyroid cartilage and the cranioventral aspect of the cricoid cartilage. The medial part of the cricothyroid membrane is termed the cricothyroid ligament. The ligament is devoid of a major blood supply but may have small vessels associated near the cricoid and thyroid attachments

Hardjo S, Croton C, Haworth MD. A pilot study evaluating the utility of a novel tube cricothyrotomy technique in providing ventilation in small animals using a live porcine model.*Vet Med (Auckl)*. 2019;10:111-121
https://doi.org/10.2147/VMRR.S216551

Operational K9 Cardiac Arrest #1

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EMT

1. Initiate chest compressions
2. High-flow O_2 with BVM ventilation 1 breath every 10 chest compressions during recoil and without interrupting compressions or at a ratio of 30:2
   a. Compression rate of 100-120 compressions/minute
   b. Depth of 1/2 -1/3 of chest width
   c. End-tidal of >15 mmHg indicates good compressions
3. Continue 2-minute cycles of chest compressions with pulse checks
4. If ROSC occurs, refer to K9 Post-Resuscitation Care protocol, **OD Green 12**
5. If no ROSC in 20 minutes and ALS-trained K9 care clinician not on scene, terminate resuscitation.

A

ADVANCED EMT

6. Establish **IV/IO** without interrupting chest compressions
7. Manage the airway per **OD Green 6**. Avoid respiratory rate greater than 10/minute in cardiac arrest

P

PARAMEDIC

8. One medication intervention at each 2-minute reassessment per RECOVER clinical guidelines (doi. 10.1111/j.1476-4431.2012.00757.x)
9. EPINEPHrine 0.01 mg/kg of 1 mg/10 mL **IV/IO** push every 3-5 minutes
   a. VF/VT: amiodarone 5 mg/kg **IV/IO** push
   b. Asystole/PEA: atropine 0.04 mg/kg **IV/IO** push at the initiation of CPR, re-dose <u>every other</u> 2-minute cycle of compressions.
10. Consider causes of OHCA:
    a. Is hypovolemia suspected? If yes, give fluid bolus of 20 mL/kg
    b. Is hypoxia suspected? If yes, administer high-flow oxygen and manage airway per **OD Green 6**
    c. Do you suspect a pneumothorax? If yes, perform bilateral needle decompressions, refer to **OD Green 15**
11. Contact veterinarian for further treatment recommendations
12. If achieve ROSC, proceed to **OD Green 12**

		Weight (kg)	25	30	35	40	45	50
		Weight (lb)	50	60	70	80	90	100
	Drug	Dose	mL	mL	mL	mL	mL	mL
Arrest	Epi 1mg/10mL every other BLS cycle	0.01 mg/kg	2.5	3	3.5	4	4.5	5
	Atropine (0.54 mg/mL)	0.04 mg/kg	1.9	2.2	2.6	3	3.3	3.7
Anti-Arrhyth	Amiodarone (50 mg/mL)	5 mg/kg	2.5	3	3.5	4	4.5	5
	Lidocaine (20 mg/mL)	2 mg/kg	2.5	3	3.5	4	4.5	5
Reversal	Naloxone (0.4 mg/mL)	0.04 mg/kg	2.5	3	3.5	4	4.5	5

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Termination of Resuscitation:
Consider terminating CPR when any of the following occurs:

1. ROSC
2. You are too exhausted to continue
3. Scene/situation becomes unsafe
4. No ROSC after 20 minutes of ineffective CPR **OR** 30-40 minutes of high-quality CPR

Operational K9 Post-Resuscitation Care

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines..

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EMT

1. Manage airway, **OD Green 6**
2. Administer O_2 only to keep O_2 sats greater than or equal to 94% and less than 99% (avoid hypo/hyperoxia).
3. Maintain ventilation rate between 10 - 12 breaths per minute

A

ADVANCED EMT

4. Obtain IV/IO access
5. Treat hypotension with fluid boluses.
   a. Goal systolic BP is measured by return of palpable femoral pulse.
   b. For post-resuscitation hypotension, administer fluid boluses of 20 mL/kg. Total volume should not exceed 60 mL/kg

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PARAMEDIC

6. If hypotension persists: Contact the veterinarian for options such as NOREPInephrine **IV/IO infusion**.
   Preparation: mix NOREPInephrine 8 mg in 250 mL NS
   a. **Dosing** - usual dose of NOREPInephrine is 1 mcg/kg/min, follow guidelines of your veterinarian for dosing.

7. If seizure develops, check blood glucose
   a. If glucose < 70 mg/dL, administer D_{50} 0.5 g/kg **IV/IO** (**diluted** to D_{25} or $D_{12.5}$ with NS) or give 0.5 g/kg of D10W.
   b. If glucose > 70 mg/dL, provide supportive care

8. If K9 suffers loss of spontaneous circulation and re-arrests, follow the K9 Cardiac Arrest protocol, **OD Green 10.**

Operational K9 Hemorrhage Control

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EMS

1. Ascertain all sites of bleeding and control with direct pressure
    a. Extremity: apply an elastic wrap/pressure bandage, or SWAT-T.

    ****Commercially made windlass tourniquets are not effective on canines due to the tapered shape of their extremities.****

2. For deep wounds in junctional areas or areas containing large muscle bellies (neck, thigh, shoulder/triceps area) control bleeding by applying a Maine EMS-approved hemostatic agent and packing the agent in the wound and applying/maintaining pressure over the agent for a minimum of 5 minutes.
    a. Check for ongoing bleeding. If bleeding has stopped, apply appropriate pressure bandage over top of dressing; if bleeding continues, reapply pressure for a minimum of 5 minutes.
    b. If bleeding continues, 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
3. Treat for shock, if indicated, **OD Green 14**
4. Manage airway as appropriate, **OD Green 6**

A P

ADVANCED EMT/Paramedic

5. IV/IO en route if feasible. Do not delay transport for IV/IO access.

Please note that the SWAT-T should be stored in the OpK9 first aid pack only. This is **not** a Maine EMS-approved tourniquet for use on humans.

Operational K9 Hemorrhagic Shock

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

A

EMT

1. Control bleeding, refer to Hemorrhage protocol, **OD Green 13**
2. Manage airway as appropriate; see **OD Green 6**

ADVANCED EMT

3. IV/IO en route
4. If shock present (see below table), perform fluid bolus according to the following guidelines:
   a. Establish **IV/IO** access and perform 20 mL/kg fluid bolus (LR preferred) Repeat, as needed, within 15-30 min
      i. May repeat in 250-500 mL boluses to achieve palpable femoral pulse and improved mentation with MAX total dose 60 mL/kg.

P

PARAMEDIC

5. In canines with either penetrating/blunt trauma and are hemodynamically unstable, as evidenced by tachycardia, hypotension (weak femoral pulse), or other evidence of shock, and who are less than 180 minutes (3 hours) from the time of injury/hemorrhage, consider:
   a. Tranexamic acid (TXA) 500 mg **IV/IO** mixed in 250 ml of NS over 10 minutes
   b. Notify receiving facility of the need for the second 10 mg/kg dose of TXA as a continuous infusion over 8 hours

Stage of Shock	HR beats/min	Capillary Refill secs	Mucous Membranes	Mentation	Pulse Quality	SBP mmHg
Normal (at rest)	<120	<2	Pink	Bright, Alert	Strong	>90
Acute Compensatory	>120	<1	Red	Alert	Fair	>90
Early Decompensatory	>140	>2	Pale	Depressed	Weak	<90
Terminal/ Irreversible	<80	Absent	Pale	Stupor/ Comatose	Absent	Low

Operational K9 Chest Trauma

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EMT

1. O_2, as appropriate
2. Assist ventilations (PPV), if needed
3. Impaled Objects
   a. Secure in place with bulky dressings
4. Open chest wound
   a. Cover with vented or non-vented occlusive dressing
   b. If shock present, consider tension pneumothorax has developed and burp/vent the chest seal.
5. Flail segment with paradoxical movement and respiratory distress
   a. Consider PPV

ADVANCED EMT

6. IV/IO en route
7. If shock present,
   a. Perform fluid bolus of 20 mL/kg LR

PARAMEDIC

8. For presumed tension pneumothorax, perform chest decompression
   a. Landmark
      i. 7th - 9th intercostal space (canines have 13 ribs)

-OR-

      ii. Midpoint between shoulder and last rib/widest point on rib cage

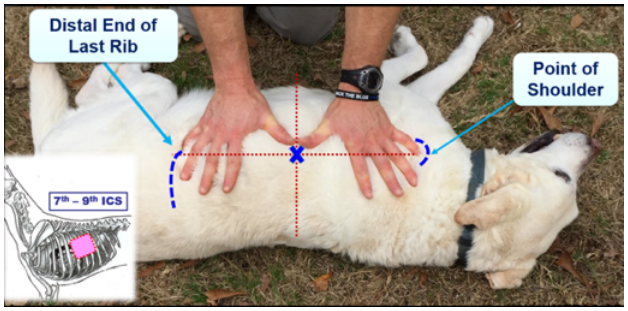

Photo used with permission from K9 TCCC Quick Reference Guide

   b. Go over top (cranial) aspect of rib
   c. Aspirate and consider decompressing the other side of the chest as well
      i. Remember the canine mediastinum is fenestrated
   d. DO NOT leave catheter(s) in place unless otherwise directed

NOTE: Chest decompressions will be performed using a Maine EMS-approved device.

Operational K9 Burns

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EMT

1. Remove collar/harness/vest/booties, etc. Avoid pulling away any gear that is melted in the the skin/coat
2. O_2, as appropriate
3. Give highest priority to airway problems and major trauma
4. If burn is < 15% of TBSA (superficial or partial thickness), consider cooling burn with cool water (sterile water/saline if available)
5. Cover burn with dry dressing, sterile sheet, or commercially prepared dry dressing
6. Prevent heat loss/hypothermia
7. If suspect CO/CN poisoning, refer to **OD Green 18**

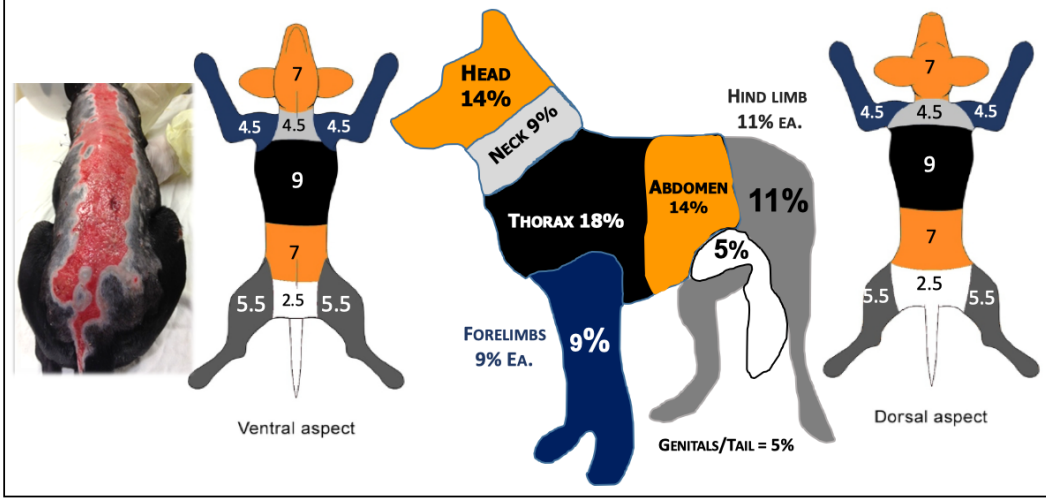
A P

ADVANCED EMT/PARAMEDIC

8. IV/IO en-route
9. If shock present, perform fluid bolus of 20 mL/kg of lactated ringers
10. If shock NOT present and TBSA > 20% or full thickness burns present, deliver fluid bolus as follows:
    a. 2mL/kg x %TBSA burned = amount to be given in first 8 hours

Body Surface Area In K9s – "K9 Rule of 9's"

Henriksson A, Kuo K, Gerken K, Cline K, et al. J Vet Emerg Crit Care, 2021 (pending publication)



Operational K9 Opioid Overdose

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These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

WARNING: CONTACT WITH THESE TOXINS CAN BE FATAL TO RESCUERS CONSIDER SCENE SAFETY AND DECONTAMINATION

Don appropriate PPE as opioid exposure is often due to contact with the opioid in powder form and cross contamination can occur between the OpK9, handler, and EMS clinician. Please alert the Veterinary Hospital as soon as feasibly possible so that they can take appropriate precautions as well.

Opioid overdose in canines is manifested primarily by *excessive sedation*, *bradycardia*, and *hypothermia*. Canines are less susceptible than humans to the respiratory depressant effects of opioids.

EMT

1. Administer O_2, as appropriate
2. Manage airway providing rescue breaths if RR < 8, see **OD Green 6**
3. Consider securing canine with muzzle in anticipation of reversal of opioid
4. If it is suspected that the canine came into contact with an opioid and is showing symptoms of opioid overdose, administer:
   a. Naloxone 2-4 mg **IN**, repeat every 2-5 minutes as needed (dose depends upon pre-packaged medication); OR
   b. Naloxone 2-4 mg **IM** via auto-injector (dose depends upon device), repeat every 2-5 minutes as needed

A P

ADVANCED EMT/PARAMEDIC

5. Establish IV/IO access
6. Alternative route of administration:
   a. Naloxone 2-4 mg **IV/IO**; may repeat every 2-5 minutes.
7. If canine is hypotensive, administer a fluid bolus of 20 mL/kg of LR

Northern New England Poison Center: (800) 222-1222
Animal Poison Helplines (Fees may apply):
- ASPCA Animal Poison Control: (888) 426-4435
- Pet Poison Control Helpline: (855) 764-7661

Operational K9 CO/CN Exposure/Smoke Inhalation

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Don PPE if necessary, assess canine after evacuation
Remove canine from source of smoke/inhalation

EMT

1. Secure canine per **OD Green 2**
2. Manage airway as per **OD Green 6**

If suspect CO/CN exposure:

3. Administer high-flow O2
   *pulse oximetry may be inaccurate in exposure to CO/CN

A

AEMT

4. If hypotensive, administer IV/IO bolus of 20 mL/kg of LR, may repeat x 1

P

PARAMEDIC

5. In case of severe CN toxicity, either alone or in combination with CO exposure:
   a. Hydroxocobalamin (Cyanokit) - 150mg/kg **IV/IO** over 10-15 minutes, with consultation with the receiving veterinarian *strongly* encouraged.

Clinical signs of cyanide toxicity are frothing at the mouth, rapid/deep breathing, excitability (tremors, seizure), and can progress to severe respiratory depression, loss of consciousness, coma, and death.

Operational K9 Nerve Agent/ Organophosphate / Carbamate Exposure

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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-Bs** (**B**radycardia, **B**ronchorrhea, **B**ronchospasm)
- If you suspect a bioterrorism/WMD threat, see **Grey 27**
- Transport canine with all windows of ambulance open
- Decontaminate entire ambulance after canine transport
- All responders who contacted the canine require decontamination

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In unstable canines with known organophosphate/carbamate poisoning:

EMT

1. Remove canine from contaminated area and consider decontamination as needed based on scene/call circumstances
2. O_2 as appropriate
3. Manage airway as appropriate, see **OD Green 6**
   Ventilatory support may be critical in these poisonings
4. Vigorous suctioning may be necessary
5. Mark 1 kit (noted as **auto-injector** in table below)

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ADVANCED EMT/PARAMEDIC

6. IV/IO en route
7. In all cases, continue to monitor closely for worsening symptoms

Symptoms/ Medications	Dyspnea, twitching, nausea, vomiting. sweating, confusion, or pinpoint pupils	Apnea, seizure,unconsciousness, or flaccid paralysis
Atropine	0.2-0.5 mg/kg **IM/IV/IO** or **ONE** auto-injector (2mg) per 20 lb Repeat every 10-20 minutes as needed with preference of repeat doses of 0.1 mg/kg if feasible	
2-PAM Chloride	10-20 mg/kg **IM** every 8-12 hours as needed	

* If atropine is drawn up from a vial to administer **(Paramedic),** the concentration may require more than one injection site to achieve the full dose without exceeding the recommended 3-5 mL max IM volume

Atropine	Lb	Kg	Dose (mg)	Min #auto-injectors
	40	18	3.6 - 9	2
	50	22	4.5 - 11.4	2
	60	27	5.4 - 13.5	2
	70	32	6.4 - 16	3
	80	36	7.2 - 18	3
	90	41	8.2 - 20.5	4

2-PAM Chloride	Lb	Kg	Dose (mg)	Min # auto-injectors
	40	18	180-360	2
	50	22	227-450	2
	60	27	270-540	2
	70	32	320-640	3
	80	36	360-720	3
	90	41	410-820	4

Operational K9 Heat Illness #1

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

- Canines do not sweat. Their predominant cooling mechanism is by panting.
- The progression of heat injury in the canine can be quite rapid and requires immediate intervention.
- Causes are environmental, exertional or a combination of the two.
- Prevention is key - it is important for handlers to assure that their canines are acclimated, and physically conditioned to the climate and level of activity. Consider work:rest cycles and adequate hydration.
- **AVOID** muzzles unless required for safety reasons; an open basket muzzle is the preferred muzzle in this case to allow for panting.

	Core Temp* (F)	HR	MM	LOC	Panting**	Behavior/Performance
Mild (heat stress)	Varies 105-106	Fast, Strong	Moist, Pink	Alert	Heavy, Controlled	Excessive thirst, discomfort with physical activity, slightly decreased performance
Moderate (heat exhaustion)	106-108	Fast, Strong, or Weak	Tacky or Dry, Bright Red	Alert	Uncontrolled, Failure to Salivate	Weakness, anxiety, unwillingness to work, acts tired, unresponsive to handler commands
Severe (heat stroke)	Usually > 108	Weak	Dry Pale	Altered	Maybe	Vomiting, diarrhea, ataxia, head tremors, seizures, blindness, abnormal pupil size

*Many canines are not trained or tolerable of rectal temps; may use axillary temperature if a rectal temp is not achievable. Axillary temps are approximately 1-2 degrees F less than rectal
Refer to PEARL in **OD Green 22

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Treatment for all stages of heat illness includes:

1. Remove the canine from the heat source and stop their work/exercise
2. Begin cooling methods
3. Monitor temperature (rectal or axillary)
4. Monitor for changes in mentation
5. Monitor closely for several hours to make sure illness does not progress to the next stage and that a rebound low body temperature does not develop.

Source: DHS Working Dog Handler Medical Care Manual 2017

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EMT

Mild Heat Injury (heat stress)

6. Cool by bringing to a shaded or lightly air-conditioned area. If no A/C available, use circulating fan to blow a light breeze by the canine
7. As feasible, remove muzzles, harnesses, tactical gear, etc.
8. Place on a cool surface to promote conductive cooling
9. Offer cool water and encourage drinking
10. Ensure the canine is afforded ample time to rest and recover where they are displaying no signs of heat stress.
11. Monitor vital signs every 5 minutes; discontinue cooling efforts when core temp is 104F or less.
12. Ideally, these canines should not return to work or participate in outdoor activity for the rest of the day.

Moderate Heat Injury (heat exhaustion)

13. Follow guidelines above and start active external cooling
    a. Use cooling fans or air conditioning to reduce core body temperature
    b. Place cold compresses or wrapped in towels on the head and neck as well as the axillae and groin. Avoid placing ice packs on the limbs as this shunts hot blood back to the core.
    c. Douse or spray body with cold water; soak hair to skin with cold water and use fans or A/C to cool further.
14. Monitor vital signs every 5 minutes; discontinue cooling efforts when core temp reaches 104F
15. Dry canine off, place on dry surface and avoid direct application of air on canine from circulating fans or A/C.
16. Continue to monitor temperature every 10 minutes for at least the next few hours as body temperature may continue dropping to the subnormal range or rise excessively again.
    a. If body temperature drops below 100F (rebound hypothermia) consider passive warming by covering with blankets or other similar materials
17. Transport to appropriate veterinary treatment facility

Severe Heat Injury (heat stroke)

*****This is a life-threatening condition*****

18. Rapid cooling to a body temperature of 103.5-104 F
    a. Cool water (do not submerge in ice bath)
    b. Soaking the canine to the skin with cool water. Soak the entire canine as rapidly as possible through the hair, soaking the skin thoroughly and implement convective cooling with cooling fans or A/C.
19. When temperature reaches 104 F, remove from bath/water, dry hair and continue to monitor temperature, watch for rebound hypothermia, as above.
20. Transport to appropriate veterinary treatment facility

Source: DHS Working Dog Handler Medical Care Manual 2017

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AEMT/PARAMEDIC

21. Establish IV/IO access for moderate and severe heat-related illness
22. Administer 20 mL/kg fluid bolus IV/IO of LR
    a. Repeat as needed to achieve palpable femoral pulse and HR < 120 bpm and improved mentation
23. Check blood glucose. If <60 mg/dL, administer 0.5 g/kg D_{50} **IV/IO** (diluted to D_{25} or $D_{12.5}$ in NS) or give 0.5 g/kg of D10W
24. Supplemental oxygen via face mask
25. Transport to appropriate veterinary treatment facility

NOTE: No single core temperature value defines heat-related illness for all canines in all circumstances. Well-conditioned, acclimated canines may reach peak core temperatures as high 106 - 108°F while working, yet display no behavioral or clinical signs of heat stress. Base clinical assessment on presence and progression of clinical signs over core temperature.

Controlled panting: the canine can stop panting with an alcohol-soaked gauze is put in front of the nose or when the canine becomes interested in or distracted by something (i.e. toy, reward, noxious stimulus, verbal command).

Uncontrolled panting: the canine cannot stop panting even when offered a treat or reward or when exposed to alcohol-soaked gauze or other noxious stimuli.

Operational K9 Anaphylaxis

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EMT

1. Allow canine to assume position of comfort
2. Secure canine with leash/rope
3. Manage airway as appropriate, **OD Green 6**
4. Supplemental O2, as appropriate
5. If anaphylaxis identified, assist administration of EPINEPHrine auto-injector, administer an adult or pediatric (as applicable) auto-injector, or provide EPINEPHrine through the Maine EMS Check and Inject program.
    a. EPINEPHrine 0.3 mg **IM** (Adult auto-injector) for canine 20 kg or greater
    b. EPINEPHrine 0.15 mg **IM** (Pedi auto-injector) for canine less than 20 kg
6. Transport
7. May repeat IM EPINEPHrine dose every 5-15 min x 3 if signs/symptoms continue or return despite initial treatment

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ADVANCED EMT

8. If anaphylaxis identified:
    a. EPINEPHrine 0.3 mg **IM** [0.3 mL of 1mg/mL] for canine 20 kg or greater,
    b. EPINEPHrine 0.15 mg **IM** [0.15 mL of 1mg/mL] in canine less than 20 kg
9. IV/IO en route
10. If shock present, perform fluid bolus of 20 mL/kg and may repeat x 3 to MAX total volume of 60 mL/kg
11. If wheezing persists 5-15 minutes after EPINEPHrine administration, consider administration of albuterol via nebulizer 2.5 mg x 1

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PARAMEDIC

12. Diphenhydramine 2 mg/kg **IM** (do **not** give IV)*
13. For mild allergic reactions/cutaneous allergies, the *handler* may administer 4 mg/kg diphenhydramine **PO**

PEARLS

In canines, cutaneous (i.e. urticaria/hives, pruritis/itching) signs of allergies are uncommon. However, with progression to anaphylaxis, clinical signs are most often associated with the cardiovascular (CV) and gastrointestinal (GI) systems. Respiratory signs may also develop, along with seizures and anxiousness, progressing to weakness and collapse.

Signs include:

- CV: tachycardia, weakness, weak pulses, mucous membrane color changes
- GI/GU: urinating, vomiting, and diarrhea that is often bloody
- Respiratory: increased respiratory effort, wheezes, and crackles

*IV diphenhydramine can cause significant hypotension, therefore give **IM**

Operational K9 Gastric Dilatation Volvulus (GDV)

These canine guidelines are reserved for use only on Operational K9s, who are injured or become ill while on duty, by appropriately trained EMS personnel. Ill or injured humans always take priority over canines.

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GDV (aka "bloat") progresses very rapidly and recognizing the symptoms in the canine quickly can save their life. Initial signs are often associated with abdominal pain. These can include, but are not limited to:

- **an anxious look or looking at the abdomen**
- **extreme agitation due to acute pain**
- **standing and stretching, head and tail down with an arched back**
- **pacing, accompanied with the inability to sit or lay down comfortably**
- **drooling**
- **distending abdomen**
- **retching without producing anything except excessive saliva - this is the most common symptom, and sounds like dry-heaving but can sometimes sound like a repeated cough.**

EMT

1. Immediate transport in position of comfort
2. Notify veterinary center early of GDV concern

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AEMT

3. IV/IO access in the forelimb en route if feasible (do <u>not</u> delay transport for IV/IO access)
4. Administer fluid bolus of LR 20 mL/kg I**V/IO**

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PARAMEDIC

5. Place canine on their side with side of maximum distention up.
6. Palpate the dilated stomach and caudal edge of the rib cage.
7. Identify point of maximum tympany on the left side. Perform needle decompression of gastric dilation with a 12-14 gauge x 3.25-5.25 inch IV catheter or large-bore needle.
8. Monitor for recurrent gastric dilatation; decompress as indicated.

PEARL

The hallmark presentation of GDV is sudden onset of abdominal distention, distress, anxiety and pain (panting, guarding of the belly, anguished facial expression), and multiple attempts at vomiting that are frequently unproductive. Not every canine will have a classic appearance and some canines will not have obvious abdominal distention because of their body configuration.

Operational K9 M^3ARCH^2 PEDALS

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- **Move** K9 to safety
- **Muzzle** the K9 if conscious, no upper airway obstruction present, and not heat stress; handle cautiously if mentation is altered, K9 may have increased aggression
- Control **Massive Hemorrhage**
  - Direct pressure
  - Pressure bandage and/or wound packing
  - Avoid windlass tourniquets
  - Consider elastic tourniquet (i.e. SWAT-T)
- **Airway**
  - Clear oral cavity
  - Manual airway maneuvers (head and neck extended and in-line, prone positioning)
  - Advanced airway (ETT or surgical cricothyrotomy in the unresponsive canine)
- **Respiratory**/Breathing
  - Seal open chest wound
  - Tension pneumothorax management
- **Circulation**
  - IV/IO fluid resuscitation
  - TXA
- **Hypothermia**
  - Minimize exposure to elements
  - Apply survival blanket/maintain warmth
- **Head** and Trauma management
- **Pain** management (not available on formulary at this time)
- **Environment**
- **Dehydration**
- **Antibiotics** (not available on formulary at this time)
- **Lacerations/Wounds**
  Bandage open abdominal wounds
  Moisten/protect exposed organs
- **Splint** fracture (if safe to do so)

CANINE-TACTICAL COMBAT CASUALTY CARE CARD (cTCCC)

EVAC CAT: ☐Urgent ☐Priority ☐Routine

EVAC TYPE: ☐Fixed ☐Rotary ☐Ground ☐MEDEVAC ☐CASEVAC

UNIT: _____ **NAME:** _____ **TATTOO:** _____

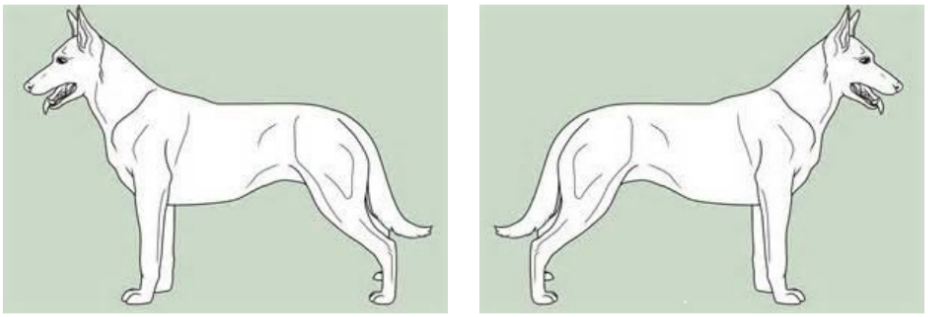
DATE: (DD-MM-YY) _____ **TIME:** _____ **GENDER:** ☐M ☐F

Mechanism of Injury: (Mark **X** all that apply

☐IED ☐GSW ☐MINE ☐BURN ☐GRENADE ☐ARTILLERY ☐FALL

☐OTHER: _____

Injury: (Mark all injuries that apply with an **X**)



Signs and Symptoms: (fill in the blank)

Time					
Pain Score (0-10)					
Temperature (99-102.5)					
Pulse Rate/Location (60-80)					
Respirations (16-30)					
Blood Pressure (120/80)					
Pulse Ox% (> 95%)					
Capillary Refill (< 2 sec)					

NOTES: _____

_____

_____

DD FORM 3073 OCTOBER 2019 (Send card to dog.consult@us.af.mill) Page of

https://jts.amed.army.mil/assets/docs/forms/DD_3073_Canine_Tactical_Combat_Casualty_Care_Card.pdf.

K9 Normal Vitals & Glasgow Coma Score

Parameter	Normal Value
RR	10 - 40 breaths/minute
HR	60 - 80 bpm (up to 130 post exercise)
Capillary Refill	less than 2 sec.
Rectal Temp	100 -102.5 F (103-106 F post exercise)
LOC	Bright, alert, responsive (BAR)
BP	120/75 mmHg
Blood Glucose	70 - 120 mg/dL
SpO2	greater than 94%
EtCO2	35 - 45 mmHg

K9 Modified Glasgow Coma Score	
Motor Activity	
Normal gait, normal spinal reflexes	6
Hemiparesis, tetraparesis, or decerebrate activity	5
Recumbent, intermittent extensor rigidity	4
Recumbent, constant extensor rigidity	3
Recubment, constant extensor rigidity with opisthotonus	2
Recumbent, hypotonia of muscles, depressed or absent spinal reflexes	1
Brain Stem Reflexes	
Normal pupillary light reflexes and oculocephalic reflexes	6
Slow pupillary light reflexes and normal to reduced oculocephalic reflexes	5
Bilateral unresponsive miosis with normal to reduced oculocephalic reflexes	4
Pinpoint pupils with reduced or absent oculocephalic reflexes	3
Unilateral, unresponsive mydriasis with reduced or absent oculocephalic reflexes	2
Bilateral, unresponsive mydriasis with reduced or absent oculocephalic reflexes	1
Level of Consciousness	
Occasional periods of alertness and responsive to environment	6
Depression or delirium, capable of responding to environment but response may be inappropriate	5
Stupor, responsive to visual stimuli	4
Stupor, responsive to auditory stimuli	3
Stupor, responsive only to noxious stimuli	2
Coma, unresponsive to repeated noxious stimuli	1

Score Interpretation	
Grave	3-6
Guarded	9-14
Good	15-18

Source: www.K9tecc.org

Enter Weight Below (kg)				
30.00				
Emergency Formulary for Operational K9s				
Drug	**Dosage**	**Dose for 30 kg dog**		**Units**
ALS DRUGS				
EPINEPHrine	0.01 mg/kg **IV/IO** (1mg/10 mL) Cardiac Arrest q5min	0.3		mg
Atropine	0.04 mg/kg **IV/IO/IM** q4 min	1.2		mg
Amiodarone	5 mg/kg **IV/IO**	150		mg
Defibrillation	2-4 J/kg	60	120	J
ANESTHETICS				
Tetracaine 0.5%		1-2 drops/eye		
DRUG REVERSALS				
Naloxone	2-4 mg **IV/IO/IM/IN**; repeat q2-5 min	2 - 4		mg
ANTIEMETICS				
Ondansetron	0.2 - 0.5 mg/kg PO or **IV/IO** (slowly over 2-15 min) q8h	6	15	mg
MISCELLANEOUS				
Diphenhydramine	2-4 mg/kg **IM** or 4 mg **PO** q8-12h	60	120	mg
EpiPen	0.15-0.3 mg **IM**	0.3		mg
EPINEPHrine	0.01 mg/kg **IM** (1 mg/1mL) Anaphylaxis q3-5 min	0.3		mg
D50	0.5 g/kg **IV** slowly (dilute 1:1 with saline to make 25% or 1:2 to make D12.5) Can also deliver **IV/IO** via D10	15		grams
Atropine	0.2-0.5 mg/kg **IM** for organophosphate poisonoing	6	15	mg
	repeat dose of 0.1 mg/kg **IM** every 10-20 min	3		mg
2-PAM Chloride	10-20 mg/kg **IM** every 8-12 h	300 - 600		mg
Hydroxocobalamin	150 mg/kg **IV/IO** infuse over 10-15 min	4500		mg
Avoid **NON-STEROIDAL ANTI-INFLAMMATORY** medications (ASA, ibuprofen, etc) in the trauma patients				
Fluid Resuscitation Guideline				
Acute Trauma 1. *Without active* Hemorrhage, **OR** *2. With controlled* Hemorrhage				
Crystalloid	20 mL/kg **IV/IO** (can repeat x 2)	600		mL
Traumatic Shock 1._ *With uncontrolled* active hemorrhage, **OR** 2. With internal body cavity bleeding				
Crystalloid	10 mL/kg **IV/IO** and only if evac time is >30 min (repeat only x2)	300		mL
TXA	500 mg **IV/IO** slow infusion	500		mg
Acute trauma with: 1. Head trauma, **OR** 2. Pulmonary contusions (blast, overpressure or blunt trauma)				
Crystalloid	10 mL/kg **IV/IO** given ONCE; no more than 250 mL total if pulmonary contusion known or highly suspected	300 (250 if pulm contusion)		mL