WESTERN REGIONAL
EMERGENCY MEDICAL ADVISORY COMMITTEE

WREMAC

Serving 8 counties of western New York

ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE,
GENESEE, NIAGARA, ORLEANS, WYOMING

2015

9-1-1 Protocols

Pediatrics

Operational

Tactical Emergency Medicine Protocols

Appendices

I. PURPOSE

These protocols serve four levels of EMS providers: AEMT-P, AEMT-CC, AEMT and EMT. They are not intended to be absolute treatment doctrines, rather guidelines which are sufficiently flexible to accommodate the complexity of patient management. They are not a substitute for sound clinical judgment. Deviations from these protocols may be deemed necessary by the Medical Control physician depending on the clinical situation.

These protocols serve three purposes. They:

1. Provide standing orders for providers to follow with regionally accepted management of specific patients.
2. Serve as a basis for Continuous Quality Improvement, each of which is a component of off-line Medical Oversight.
3. Provide treatment guidelines for physicians providing orders via direct communication (on-line Medical Consultation).

The goal of prehospital care is to have the patient receive DEFINITIVE CARE in as timely and safely a manner as possible.

II. GENERAL INFORMATION

These protocols apply to all patients, regardless of how they enter the EMS system. These protocols assume that Basic Life Support (BLS) is initiated (according to the current Statewide BLS Treatment Protocols) immediately and without the need for on-line medical consultation. BLS interventions are included in the protocols to insure a smooth transition of care between BLS and ALS. Unless specified in an individual protocol, high flow supplemental oxygen shall be applied to any patient who has an SaO2 less than 94% or has difficulty breathing.

It is understood that the ALS providers will administer only those medications or interventions which they have been trained in and credentialed to perform, and only those which are included in these protocols. EMS providers shall not exceed their scope of practice.

a) AEMT-Ps may perform all of the interventions contained in these protocols and approved by their Medical Directors. Some interventions (e.g. RSI) require special training and credentialing.
b) AEMT-CCs may perform all of the interventions contained in these protocols which have been approved by their Medical Directors, but, they must be current in regional pediatric CME criteria in order to perform any pediatric standing orders. **They may only perform interventions that are listed past the CCT stop lines after *contacting* MC**. These interventions ***may not*** be made standing orders by service medical directors.
c) AEMT may not perform any interventions that are past their stop line unless explicitly indicated in the protocols.

From time to time a medication may become unavailable, at which time, the medical Director may approve of a substitute medication. This Medical Director-approved medication may be used for the ALS provider provided it is within the same class of medication already used. The WREMAC must be notified immediately and the substitute medication must ultimately be approved by the WREMAC at its next meeting.

III. CARDIAC MONITOR, DYSRHYTHMIA & BIPHASIC EQUIVALENT

A cardiac monitor should be applied by the Critical Care or Paramedic as soon as feasible on every patient who has an ALS complaint.

When cardioversion or defibrillation is indicated, the equivalent biphasic shocks are acceptable if the provider has a biphasic device.

IV. COMMUNICATION FAILURE

A second or back-up MC Physician(s) may be called only if the primary MC physician designated by the service Medical Director is not available or cannot be contacted, e.g. in a communication failure. ALS providers must not proceed beyond standing orders without contacting MC.

After the completion of a call in which there has been a communication failure, the agency medical director should be contacted immediately to discuss the call, and the PCR flagged for QI review.

V. PEDIATRIC PROTOCOLS

In accordance with the American Heart Association, the term infant refers to a person < 1 year old (y.o.). A child is >1 and < 15 y.o. or before obvious signs of puberty appears (facial hair, acne, axillary hair, breast development). There may be overlap between the pediatric and adult protocols in treating patients 10-15 y.o. Pediatric dosages and equipment sizes may be calculated using charts, tapes, books, tables, etc. that are approved by the Medical Director.

VI. INTRAVENOUS/INTRAOSSEOUS ACCESS

Intravenous access should not, in most cases, cause a delay in transport due attempts on-scene and should be started enroute. The exceptions to this include, but are not limited to:

a) Situations when an IV line is essential for the immediate administration of life-saving fluid or medication (max 3 attempts).
b) When there is unavoidable prolonged scene time (e.g. when non–transporting services are awaiting the arrival of transporting service).
c) When there are enough ALS providers present to perform multiple tasks simultaneously.

In cardiac arrest, profound shock in adults and pediatrics, when a life-saving medication must be administered IV, or when directed by MC, an intraosseous (IO) needle may be used. Only properly credentialed AEMTs may perform this skill.

Contraindications for an IO include: recently fractured bone or bone diseases such as Osteogenesis Imperfecta and Osteoporosis. An IO needle should not be inserted through an area of infected skin (cellulitis), or an area of burned skin without calling MC.

Most medications given through an IV can be given through the IO. Following insertion of the IO, the needle should stand freely on its own. Attempt should be made to aspirate bone marrow. This is successful about 50% of the time. Because of the increased resistance of the bone marrow, fluids may drip very slowly. If the IO is in place, push the infusion in with a large syringe to deliver a rapid infusion. Monitor the infusion to avoid extravasation of fluid.

A Saline trap may be substituted for an IV line when the patient does not require IV fluids. Properly label all IV/IO sites.

When possible, blood samples should be drawn **and properly labeled**, when IVs are started. These MUST be labeled with the patient's name, time of blood draw and provider's initials before handing over to the emergency department staff.

VII. CONTACTING MEDICAL CONSULTATION (MC)

On-line medical consultation should be provided by an approved physician or physician's assistant at a facility designated by the ALS provider's medical Director. **Medical consultation orders may only be received from a WREMAC credentialed physician or physician assistant (PA)**.

A medical consultation must be requested in the following situations:

a) The signs or symptoms do not neatly fit into one of the protocols or the EMS provider is uncertain which protocol to follow.
b) Deviation from standing orders appears to be necessary.
c) Standing orders have been completed and the patient's clinical condition may require additional intervention (i.e. ongoing signs and symptoms) and that intervention can be initiated prior to arrival at the receiving hospital.
d) As defined in the Refusal of Evaluations/Stabilization/Transport and Transfer of Care policies
e) The EMS provider desires information/advice from MC.

In the above situations, MC should be contacted in a timely manner.

It is not necessary to contact MC in the following situations:

a) Patient is stable and does not require further intervention.
b) The E.T.A. is less than the time required to initiate an intervention which may be ordered by MC.
c) Pulseless adults with a valid DNR or obvious death criteria
d) In mass casualty incidents

THE MEDICAL DIRECTOR(S) OF THE AGENCY MAY SET ADDITIONAL STANDARDS REGARDING INITIATING A MEDICAL CONSULTATION.

VIII. CONFLICT RESOLUTION

When orders given by MC appear to the ALS provider to be inappropriate, the ALS provider should:

a) Clarify the order.
b) Clarify the patient's condition.
c) Document this discussion at the end of the run.

If MC does not alter or retract the order, the ALS provider must carry out the order unless:

a) The ALS provider is not credentialed nor trained to provide the intervention ordered. ALS providers shall not exceed their scope of practice.
b) The intervention is not listed in these protocols.

All such cases shall be reviewed by the ALS provider's Medical Director.

IX.TRANSPORT

Transport the patient as soon as possible to the nearest appropriate hospital as per the *NYS BLS Protocols, General Approach* section on *Transport.*

Whenever possible, all current medications with containers, and written directives regarding patient care (e.g. DNR, Health Care Proxy, etc.) should be transported with the patient.

Lights & Sirens should be used with extreme caution and with the best interest of the patient in mind. The provider must weigh the risks of L & S (injury to self/others, increased patient anxiety, etc.) with any potential benefit (decreased transport time). L & S should be considered only if there will be a significant delay in transport time without L & S (e.g. usually due to extreme traffic congestion).

Helicopter transport may be considered in certain situations. Refer to "Helicopter Utilization Guidelines" in the Appendix of these protocols

X. QUALITY IMPROVEMENT

The service medical director shall identify situations, procedures or type of patient complaints that the medical director considers high risk and require 100% quality review. These shall be set forth in agency policy. From time to time, the WREMAC Quality Improvement committee may recommend certain items or issues for 100% review by the medical director or designee.

XI. DOCUMENTATION

The PCR should clearly document:

a) Events which occurred prior to arrival of the ALS provider, for example actions of first responders, medications taken, estimated blood loss, etc.
b) A description of the scene, for example damages sustained to an automobile involved in an MVC. Photographs should be considered, but should never delay transport.
c) All interventions including medication dosages and routes of administration.
d) All "call times" and times for all vital signs, interventions, and rhythm strips.
e) Name or number of the physician providing MC, the time contact was made, and which intervention(s) was ordered by MC.
f) Rhythm strips for every monitored patient should be recorded and attached to the PCR including at least one strip for each dysrhythmia encountered.
g) 12 lead EKGs, if obtained, should be attached to the PCR.
h) Reason for transport to a particular facility (i.e. patient/family request, M.D. request, closest appropriate facility, police/social service direction, Trauma Transport policies, etc.)
i) If the body remains at the scene, the hospital copy of the paper PCR should be provided to the Medical Examiner/Coroner or the Law Enforcement Officer taking control of the body.

Procedure: AIRWAY MANAGEMENT

EMT

- Oxygen administration / Assist ventilations with bag valve mask
- Call for ALS intercept enroute to the closest Emergency Department
- Consider CPAP for a spontaneously breathing patient, if indicated and credentialed by medical director (See PROCEDURE: CONTINUOUS POSITIVE AIRWAY PRESSURE).

EMT STOP

AEMT

- Needle thoracostomy if tension pneumothorax is present, OR bilateral needle thoracostomy if traumatic cardiac arrest (see Key Points).
- Evaluate the patient for characteristics of a difficult airway using LEMON. If characteristics of a difficult airway are present, consider using an elastic gum bougie during intubation attempt, OR placing a supraglottic airway.
- Endotracheal intubation (with cervical spine precautions prn) OR place FDA approved supraglottic airway device. ET: maximum 2 attempts and must be monitored with continuous waveform capnography from time of intubation.
  ***NOTE*: If unable to intubate, place supraglottic airway or just ventilate patient**.
- Consider topical anesthetic spray or jelly prior to intubation/supraglottic airway placement.

AEMT STOP

CRITICAL CARE

- ***If unable to secure airway or adequately ventilate, perform needle or percutaneous cricothyrotomy with FDA approved device, if credentialed.***
- Place naso- or orogastric tube to decompress the stomach contents after the airway is secured.

CC STOP

PARAMEDIC

- If credentialed by medical director, consider MFI protocol.
- Surgical airway, if approved and credentialed by medical director.

PARAMEDIC STOP

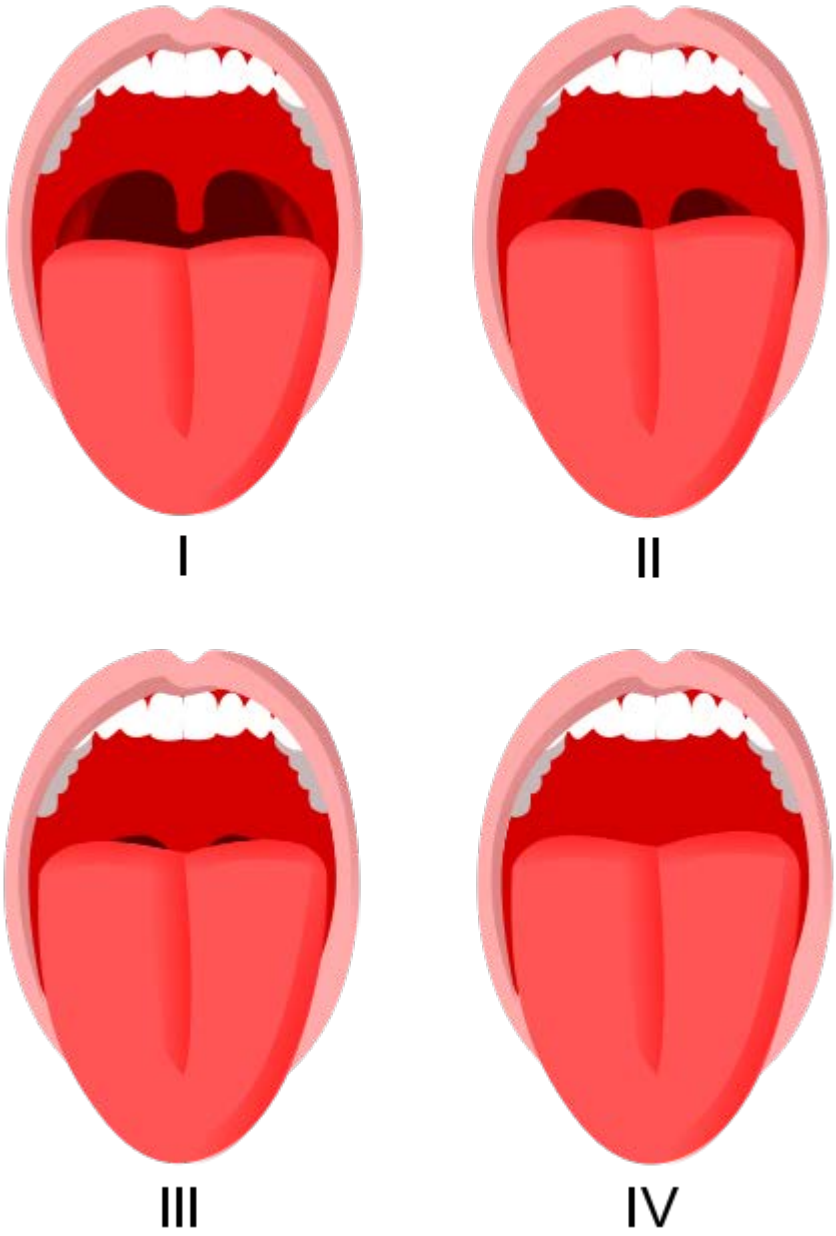
PHYSICIAN OPTIONS

- Additional intubation attempts by more experienced or higher level provider.

Key Points/Considerations

- Signs of a tension pneumothorax requiring needle thoracostomy include unilateral loss of breath sounds, hypotension, hypoxia, evidence of penetrating or blunt chest trauma on the affected side, distended jugular veins, and tracheal deviation away from the affected side (late sign).
- Confirm endotracheal tube placement with auscultation and continuous waveform capnography.
- Maintain continuous waveform capnography if ETT placed until the patient is placed onto the ED stretcher.
- LEMON is a mnemonic that can be used to help assess for potential difficulty in intubation.
  L: Look for facial / airway features that will affect management (e.g. facial hair, deformities, etc).
  E: Evaluate the 3 – 3 – 2 rule. The patient should be able to open the mouth three fingerbreadths. The distance between the chin and the hyoid bone should be three fingerbreadths and the distance between the hyoid bone and the larynx should be 2 fingerbreadths.
  M: Mallampati score assesses visualization by asking the patient to open her mouth (see diagram). A score of 3 or 4 indicates likely difficulty with intubation.
  O: Obstruction, including stridor or foreign bodies
  N: Neck mobility - The less the mobility, the greater the difficulty.

Mallampati Classification: Increasing difficulty from I to IV



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Procedure: MEDICATION FACILITATED INTUBATION

INDICATIONS

- For use only by Paramedics credentialed by their Medical Director and with the assistance of a second MFI trained RN or ALS provider on scene.
- Medication facilitated intubation (MFI) may be utilized on standing orders when definitive airway control is necessary in a patient **14 years old or older.***

CONTRAINDICATIONS / PRECAUTIONS

- The use of paralytic agents is contraindicated if patients cannot be ventilated with a bag-valve-mask (BVM) due to anatomy, facial/airway trauma or other reasons.
- If unable to adequately ventilate the patient, perform cricothyroidotomy.

PROCEDURE

- Position the patient appropriately. Attach SaO_2, NIBP (if available) and Cardiac Monitor.
- Preoxygenate via NRB or with a BVM.
- Assemble and test all basic and advanced airway equipment including suction.
- Draw appropriate medications into labeled syringes.
- Have a second rescuer apply and maintain cricoid pressure.
- Administer Etomidate (Amidate) 0.3 mg/kg rapid IV push.
  - If ideal intubating conditions are obtained, intubate the patient.
  - Ketamine (Ketalar) 2mg/kg IV (one dose) **<u>with on-line medical command</u>** is an alternative induction medication to Etomidate (Amidate).
- If ideal intubating conditions are not obtained, administer:
  - Succinylcholine (Anectine) 1.5 mg/kg IV **OR**
  - Rocuronium (Zemuron) 1 mg/kg IV.
- An additional two (2) attempts (maximum total attempts = 4 per patient) is permitted if performing Medication Facilitated Intubation.
- If intubation unsuccessful, or intubating conditions are poor, insert a supraglottic airway device.
- Abandon attempt if SaO2 < 90% during the attempt. Ventilate the patient until SaO2 > 98%.
- If unable to adequately ventilate the patient, perform needle or percutaneous cricothyroidotomy.
- Attach a continuous $EtCO_2$ monitor, confirm ETT placement and secure the ETT.
- Administer continual sedation with:
  - Midazolam (Versed) 2 mg IV every 5 minutes PRN **OR**
  - Lorazepam (Ativan) 2 mg IV every 5 minutes if hemodynamically stable **OR**
  - Diazepam (Valium) 5 mg IV every 5 minutes if hemodynamically stable **OR**
- Administer Vecuronium (Norcuron) 0.1 mg/kg or Rocuronium 1mh/kg IV ONLY if necessary for patient safety.
- Place naso- or orogastric tube and decompress the stomach contents.
- Continuously monitor ETT placement including effectiveness of oxygenation and ventilation.

PHYSICIAN OPTIONS

- Additional intubation attempts

Key Points/Considerations

- Prior to start of the procedure, evaluate the patient for features of a difficult airway using LEMON.
- If patient has features consistent with a difficult airway, consider utilizing an elastic gum bougie (or similar device) with the first intubation attempt or placing a supraglottic airway rather than endotracheal intubation.
- *May be used in patients age 14 and older **OR** those with obvious signs of puberty as defined in Pediatric: General Considerations.
- The ADULT PAIN / NAUSEA / SEDATION protocol should be utilized for ongoing sedation and pain management of patients who are already intubated.

Procedure: CONTINUOUS POSITIVE AIRWAY PRESSURE

EMT (if credentialed by Service Medical Director)

- Oxygen administration / Assist ventilations with bag valve mask.
- Initiate CPAP for a spontaneously breathing patient, if appropriately credentialed by medical director
- Indications for use: (must have all three)
  - Age > 10 years old
  - Signs of severe respiratory distress defined as the patient does not improve after oxygen administration & at least two of the following:
    - Respiratory Rate > 24 / min
    - SaO2 < 92%
    - Significantly decreased air movement
    - Pulmonary edema or frothy sputum, rales or severe wheezing all fields
    - Significantly increased work of breathing (e.g. retractions, tripod position, skin mottling, pallor or cyanosis)
  - Awake patient who can cooperate with CPAP
- Contraindications for use: (any one)
  - Altered mental status (GCS < 14)
  - Systolic BP < 90
  - Respiratory arrest or agonal respirations
  - Blunt or penetrating chest trauma
  - Suspected pneumothorax
  - Subcutaneous emphysema
  - Facial trauma inhibiting mask seal
  - High risk vomiting or aspiration
  - Tracheostomy
  - Stridor or suspected airway obstruction
- If indications are present and contraindications are absent:
  - Position patient in semi-fowlers position and apply a proper fitting CPAP mask at 10 cm H_2O pressure.

EMT STOP

AEMT (if credentialed by Service Medical Director)

CRITICAL CARE (if credentialed by Service Medical Director)

PARAMEDIC

- May increase by 5 cm H_2O every 5 minutes if no improvement, as long as the patient tolerates the increased pressure. (max 15 cm H_2O). May decrease by 5 cm H_2O immediately if patient unable to tolerate the pressure.

AEMT/CC/PARAMEDIC STOP

PHYSICIAN OPTIONS

- Increase CPAP pressure.

Key Points/Considerations

- Patients who have not had CPAP/BiPAP before often require coaching to breathe and relax with the machine.
- Sidestream capnography may not produce an accurate waveform secondary to high airflow rates.

Respiratory: ASTHMA / COPD

EMT

- Initiate oxygen therapy / BVM assist as necessary.
- Monitor pulse oximetry (if available).
- Follow BLS albuterol protocol if credentialed.
- Consider CPAP for a spontaneously breathing patient, if indicated and appropriately credentialed by medical director (See PROCEDURE: CONTINUOUS POSITIVE AIRWAY PRESSURE).
- Transport and intercept with ALS enroute to the Emergency Department.

EMT STOP

AEMT

- Advanced airway procedure as indicated
- Initiate IV access if severe respiratory distress or wheezing continues after first nebulized albuterol.
- Consider CPAP if indicated (SEE PROCEDURE: CONTINUOUS POSITIVE AIRWAY PRESSURE
- Albuterol 2.5 mg in 3 mL (unit dose) via nebulizer. May repeat to a total of three (3) doses

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Albuterol 2.5 mg in 3 mL (unit dose) + Atrovent 0.5 mg in 2.5 mL (unit dose) mixed together, via nebulizer May repeat to a total of three doses if needed.
- Consider 12 Lead EKG.
- Consider CPAP.
- Methylprednisolone 125 mg IV **OR** Prednisone 50 mg PO
- Magnesium sulfate 2 gram IV over 20 minutes for severe dyspnea

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional albuterol unit dose via nebulizer
- Epinephrine 1:1000 0.3 – 0.5 mg IM
- Epinephrine 1:10,000 mix 1mg in 250 mL normal saline bag. Run wide open until breathing improves then stop.
- Epinephrine 1:1000 0.5 mg Mix with 3mL normal saline nebulized.
- Terbutaline 0.25 mg SQ

Key Points/Considerations

- Remember “all that wheezes is not asthma!” Consider allergic reaction, airway obstruction, pulmonary edema, COPD exacerbation.
- A “shark fin” tracing on sidestream capnography is highly suggestive of Asthma/COPD.
- Epinephrine should only be used if patient’s tidal volume is so small that nebulized medications can’t work.
- If any provider has administered any medications they must consult medical control prior to allowing a patient to RMA or before transporting the patient BLS.
- Use epinephrine and terbutaline with caution in patients over the age of 55, those with a history of hypertension, and those with a prior cardiac history.

Respiratory: ACUTE PULMONARY EDEMA

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Sit patient upright, if possible.
- Consider CPAP for a spontaneously breathing patient, if indicated and credentialed by medical director (See PROCEDURE: CONTINUOUS POSITIVE AIRWAY PRESSURE).

EMT STOP

AEMT

- Vascular access with saline lock

AEMT STOP

CRITICAL CARE

PARAMEDIC

- CPAP, if equipped, early in care
- 12 Lead EKG (follow STEMI protocol if ECG shows an ST-elevation MI in addition to treatments below)
- Based on the patient's systolic blood pressure:
  - Hold NTG SL for a systolic BP below 100 mmHg.
  - NTG 0.4 mg SL 1 tablet every 5 minutes for a systolic BP of 100 – 160 mmHg
  - NTG 0.4 mg SL 2 tablets every 5 minutes for a systolic BP of 160 – 200 mmHg
  - NTG 0.4 mg SL 3 tablets every 5 minutes for a systolic BP over 200 mmHg
- Albuterol 2.5 mg in 3 mL (unit dose) + Atrovent 0.5 mg in 2.5 mL (unit dose) mixed together, via nebulizer, only if wheezes are present
- If unable to administer medication orally, Nitroglycerin Paste 1 – 2 inches transdermally

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Furosemide (Lasix) 40 mg IV over 2 – 3 minutes, if peripheral edema is present

Key Points/Considerations

- All patients with rales do not have pulmonary edema — consider the possibility of pneumonia or chronic obstructive pulmonary disease (COPD) exacerbation.
- May administer first dose of Nitroglycerin while preparing to establish vascular access.
- At least 50% of patients who present with acute pulmonary edema are not fluid overloaded and may even be dehydrated. The issue in those patients is abnormal distribution of fluid resulting in pooling in the lungs. Treatment goal in these patients is to restore proper fluid balance before using diuretics to prevent harm.

Respiratory: SUSPECTED SMOKE INHALATION

EMT

- Initiate oxygen therapy with non-rebreather or BVM assist as necessary.
- Monitor pulse oximetry (if available).
- Follow Carbon Monoxide Exposure protocol.
- Transport per trauma triage guidelines and intercept with ALS enroute to the Emergency Department.

EMT STOP

AEMT

- Advanced airway procedure as needed
- Initiate IV access
- If hypotensive, administer 500 mL normal saline bolus
- Albuterol 2.5 mg in 3 mL (unit dose) via nebulizer, may repeat to a total of three (3) doses

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Consider early advanced airway management if potential of airway burns
- Sodium Thiosulfate 12.5 grams IV over 10 minutes if:
  - Cardiac or respiratory arrest
  - Hypotension that does not respond to IV fluids
- Cyanokit may be substituted for Sodium Thiosulfate, however attempt to draw blood samples first.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional albuterol unit dose via nebulizer

Key Points/Considerations

- Consider early advanced airway management if evidence of airway burns, including singed hair, soot in the pharynx, a hoarse voice, or stridor.
- The Cyanokit will cause lab abnormalities for the following 48 hours. Draw labs before administering the kit if possible.

Cardiac: CHEST PAIN – Suspected Acute Coronary Syndrome

EMT

- Aspirin, four 81 mg tablets chewed (max daily dose 325 mg). **DO NOT ADMINISTER if patient has taken aspirin within 24 hrs., has active bleeding or has aspirin allergy**.
- Administer oxygen by non-rebreather if SaO2 less than 94%, rales on lung auscultation or difficulty breathing
- Assist patient with his/her own prescribed nitroglycerin (1 dose). **Hold if SBP < 120 mmHg or if taken erectile dysfunction drug in past 72 hours**.

EMT STOP

AEMT

- IV NS KVO or saline trap
- Nitroglycerin 0.4 mg SL q5 min x 3. Hold if SBP <100 mmHg

AEMT STOP

CRITICAL CARE

PARAMEDIC

- 12 Lead EKG (transmit to MC if any question) **IF CONFIRMED STEMI, FOLLOW *CONFIRMED STEMI PROTOCOL***
- Morphine 0.1 mg/kg, up to 5mg, slow IV for continuing pain. May repeat once prn. **Hold for SBP < 100 mmHg**
- If SBP < 100 mmHg and lungs clear: 0.9 NS 250 mL IV bolus.
- NTG Paste 1 – 2 inches transdermal when pain nearly resolved. **Hold if SBP < 100 mmHg**

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Morphine doses.
- Additional NTG

Key Points/Considerations

- Acquisition of a 12-lead ECG prior to administering NTG and ASA may better identify patients who are having an ST-elevation MI, therefore a 12 lead ECG should be performed as early as possible.
- Focus on maintaining ABC, pain relief, rapid identification, rapid notification and rapid transport to an appropriate facility.
- VS, including 12 Lead EKG, should be monitored frequently during transport.
- The first dose of Nitroglycerin may be administered while preparing to establish vascular access.
- Remember some patients who have MI or ACS complain of trouble breathing, nausea/vomiting, chest pressure, or other cardiac related symptoms. If any concern of a cardiac origin for the patient's complaint, perform a 12-lead ECG as soon as possible.

Cardiac: CONFIRMED ST-Elevation Myocardial Infarction (STEMI)

CCT

PARAMEDIC

- Nitroglycerin 0.4 mg SL q 5 min during transport. **Hold if SBP < 100 mmHg or inferior wall STEMI**.
- If SBP < 100 mmHg and lungs clear: 0.9 NS 250 mL IV bolus
- Morphine 0.1 mg/kg, up to 5mg, slow IV if chest pain persists. **Hold for SBP < 100 mmHg or inferior wall STEMI.**
- Contact online MC prior to transport and advise of confirmed STEMI. Discuss appropriate destination if closest facility is not a PCI-CAPABLE Center.
- Consider helicopter transport to PCI-CAPABLE Center for confirmed STEMI.
- Consider starting a second IV line.
- If time permits, acquire a right sided 12 Lead ECG.
- Perform *Chest Pain Checklist.* (appendix)

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Metoprolol 5 mg slow IV. May repeat to a total of 3 doses (15 mg), if available
- Additional Morphine doses
- Dopamine infusion, 5-10 mcg/kg/min
- Redirect transport to PCI-CAPABLE center.
- Helicopter transport from scene or for immediate interfacility transport

Key Points/Considerations

- Focus on rapid identification, rapid notification and rapid transport to appropriate facility.
- If possible, perform the 12-lead ECG within the first five minutes of patient contact.
- Minimize scene time once a STEMI is confirmed.
- Contact receiving facility before or just after initiating transport to provide as much lead time as possible.
- 12 lead EKG should be transmitted to receiving facility if possible.
- R side 12 Lead ECG is obtained by keeping limb leads, V1 and V2 in usual position and placing V3 through V6 on the corresponding landmarks on the right anterior chest.
- VS including 12 lead EKG, should be monitored frequently during transport.
- Remember some patients who have MI or ACS complain of trouble breathing, nausea/vomiting, chest pressure, or other cardiac related symptoms. If any concern of a cardiac origin for the patient's complaint, perform a 12-lead ECG as soon as possible.

Cardiac: SYMPTOMATIC BRADYCARDIA

EMT

- Oxygen administration with non-rebreather mask if:
  - SaO2 is less than 94% (if available)
  - Chest pain, hypotension, altered mental status or difficulty breathing
- Call for ALS intercept enroute to the closest Emergency Department.

EMT STOP

AEMT

- Advanced airway management as appropriate
- If symptoms present, place IV and follow Adult Hypoperfusion protocol.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- 12 Lead ECG (If STEMI, follow STEMI protocol in addition to continuing with this protocol.)
- If patient is not symptomatic (see below), monitor and transport.
- Atropine 0.5 mg IV/IO bolus, may repeat every 3 – 5 minutes if symptoms persist. (Maximum dose is 3 mg.)
- If atropine is ineffective after the first dose:
  - Transcutaneous pacing
  - Consider sedation. (Follow Adult Pain, Nausea and Sedation protocol.)

    OR
  - Dopamine infusion start at 5 mcg/kg/min and titrate to keep systolic blood pressure above 90 mmHg.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Epinephrine infusion between 2 – 10 mcg/min for persistent symptomatic bradycardia

Key Points/Considerations

- If bradycardia **is not** symptomatic (i.e. acutely altered mental status, ischemic chest discomfort, acute heart failure, hypotension or other signs of hypoperfusion), close patient monitoring is the only therapy indicated.

Cardiac: TACHYCARDIA WITH A PULSE

EMT

- Oxygen administration with non-rebreather mask if:
  - SaO2 is less than 94% (if available)
  - Chest pain, hypotension, altered mental status or difficulty breathing
- Call for ALS intercept enroute to the closest Emergency Department.

EMT STOP

AEMT

- Advanced airway management as appropriate
- If symptoms present, place IV and follow Adult Hypoperfusion protocol.

AEMT STOP

CCT

PARAMEDIC

- 12 Lead ECG (If STEMI, follow STEMI protocol in addition to continuing with this protocol.)
- If patient is **unstable*** secondary to tachycardia over 150 beats per minute:
  - Consider sedation. (Follow Adult Pain, Nausea and Sedation protocol.)
  - If Narrow Regular Complex Tachycardia, consider Adenosine 6 mg rapid IV x 1 dose.
  - Synchronized Cardioversion starting at the following recommended doses:
    - Wide Irregular: Proceed with cardioversion at maximum dose setting
    - Other rhythms: 100 Joules
- If patient is **stable** with a **wide QRS** (over 0.12 seconds) complex:
  - If Torsades, Magnesium 2 grams IV over 5 minutes
  - Regular and monomorphic:
    - Adenosine 6 mg rapid IV push followed by 20 mL saline flush
    - No conversion in 2 minutes: Adenosine 12 mg rapid IV push and 20mL saline flush
  - Irregular, polymorphic, or unresponsive to adenosine:
    - Amiodarone infusion 150 mg over 10 minutes
    - After initial infusion, Amiodarone 1 mg/min IV (record time initiated)
- If patient is **stable** with a **narrow QRS** (less than 0.12 seconds) complex:
  - Vagal maneuvers
  - Regular rhythm:
    - Adenosine 6 mg rapid IV push followed by 20 mL saline flush
    - No conversion in 2 minutes: Adenosine 12 mg rapid IV push and 20 mL saline flush
  - Irregular rhythm:
    - Diltiazem 15 – 20 mg slow IV push **OR** Verapamil 2.5 – 5 mg IV slow push
      OR
    - Metoprolol 5 mg slow IV push

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Repeat dosing of diltiazem, verapamil, metoprolol
- Procainamide 20 – 50 mg/min up to loading dose of 17 mg/kg then infusion of 1 – 4 mg/min (contraindicated if the patient is already on procainamide)

Key Points/Considerations

- Signs of an unstable patient due to the tachycardia include acutely altered mental status, ischemic chest discomfort, acute heart failure, hypotension or other signs of hypoperfusion.
- AV nodal blocking drugs (Diltiazem, Verapamil, Metoprolol) should not be given if there is a history of WPW or other accessory pathway dysrhythmias, and should NOT be used with pre-excited atrial fibrillation or flutter.

Cardiac: ADULT CARDIAC ARREST – INITIAL CARE

EMT

- Consider withholding resuscitative efforts while contacting medical direction if signs of obvious death are present (see below: Key Points/Considerations)
- CPR for 2 minutes:
  - Compressions 2 inches deep at a rate over 100/minute
  - Rotate compressor every 2 minutes
  - 30:2 compression:ventilation if no advanced airway
  - Continuous compression if advanced airway is in place
- Supplemental oxygen
- Follow AED protocol

EMT STOP

AEMT

- After AED shock (if administered), obtain IV or IO access
- Continue CPR for 2 minutes between pulse checks.
- Consider advanced airway if CC/Paramedic care delayed.
  - 8-10 ventilations/minute if advanced airway placed
- Epinephrine 1:10,000 1 mg IV/IO every 3 – 5 minutes

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Consider withholding resuscitative efforts while contacting medical direction if signs of obvious death are present (see below: Key Points/Considerations)
- If shockable rhythm go to **Adult Cardiac Arrest – Ventricular Fibrillation / Pulseless Ventricular Tachycardia** protocol.
- If non-shockable rhythm go to **Adult Cardiac Arrest – PEA / Asystole** protocol.
- If hypothermic cardiac arrest: (temperature below 32°C/90°F)
  - Continue CPR
  - Advanced airway with 8-10 ventilations/minute
  - Hold medications until patient warmed.
  - Avoid rough handling.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Termination of resuscitation attempt
- BLS Rule: Consider termination if all of the following criteria have been met:
  - Unwitnessed arrest
  - No bystander CPR
  - No return of spontaneous circulation after 3 rounds of CPR/AED shocks
  - No shock was delivered after 3 rounds of CPR
- Administer medications per **Adult Cardiac Arrest** protocols for hypothermic cardiac arrest.

Key Points/Considerations

- Obvious death criteria consists of patients who are pulseless, apneic and have any of the following:
  - Decapitation or significant mortal injury
  - Presence of decomposition
  - Presence of rigor mortis or dependent lividity

Cardiac: ADULT CARDIAC ARREST – VF/PULSELESS VT

CRITICAL CARE

PARAMEDIC

- If persistent VF/pulseless VT
  - Continue CPR for 2 minutes between pulse/rhythm checks
  - Epinephrine 1 mg IV/IO every 3 – 5 minutes (or Vasopressin 40 Units IV/IO x 1 dose may replace 1st or 2nd dose of Epinephrine)
  - Consider advanced airway, monitor with waveform capnography. Ventilate at 8 – 10 breaths/min.
  - CPR for 2 minutes
  - Defibrillation
  - If rhythm is Torsades, administer Magnesium 2 grams IV/IO push.
  - If rhythm is VF/non-Torsades VT, Amiodarone 300 mg IV/IO push (Repeat in 5 minutes with 150 mg IV/IO.)
  - Assess for and treat reversible causes.
  - Continue above. If no response to therapy after 20 minutes and EtCO2 is less than 10 mmHg
    - Contact MC for termination of resuscitation.
    - Provide support to family/bystanders.
- If rhythm not persistent VF/pulseless VT
  - If return of spontaneous circulation (ROSC), go to Post Cardiac Arrest Care protocol.
  - If PEA/Asystole, go to Adult Cardiac Arrest PEA/Asystole protocol.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Termination of resuscitation attempt

Key Points/Considerations

- All electrical shocks shall be performed at the maximum biphasic energy for the device or at 360 joules monophasic.
- ROSC is often indicated by sharp rise in EtCO2 to over 40 mmHg before pulse is palpable.
- If EtCO2 is below 20, focus on improving the quality of chest compressions.

Cardiac: ADULT CARDIAC ARREST – PEA/ASYSTOLE

CRITICAL CARE

PARAMEDIC

- If persistent PEA/Asystole
  - Continue CPR for 2 minutes.
  - Epinephrine 1 mg IV/IO every 3 – 5 minutes (or Vasopressin 40 Units IV/IO x1 dose)
  - Consider advanced airway, monitor with waveform capnography. Ventilate at 8 – 10 breaths/min.
  - CPR for 2 minutes
  - Consider reversible causes.
  - Continue above. If no response to therapy after 20 minutes and EtCO2 is less than 10 mmHg
    - Contact MC for termination of resuscitation.
    - Provide support to family/bystanders.
- If rhythm not persistent PEA/Asystole:
  - If return of spontaneous circulation (ROSC), go to Post Cardiac Arrest Care protocol.
  - If VF/Pulseless VT, go to Adult Cardiac Arrest VF/Pulseless VT protocol.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Termination of resuscitation attempt

Key Points/Considerations

- Reversible causes include hypovolemia, hypoxia, acidosis, hypo/hyperkalemia, hypothermia, tension pneumothorax, cardiac tamponade, toxic, pulmonary embolus.
- ROSC is often indicated by sharp rise in EtCO2 to over 40 mmHg before pulse is palpable.
- If EtCO2 is below 20, focus on improving the quality of chest compressions.

Cardiac: POST CARDIAC ARREST PROTOCOL

EMT

- Initiate oxygen therapy / BVM assist as appropriate.
- If patient conscious:
  - Administer Aspirin two 81 mg tablets chewed. DO NOT ADMINISTER if patient has taken aspirin within 24 hrs. or has aspirin allergy.
  - Assist patient with his/her own prescribed nitroglycerin (1 dose) for chest pain. Hold if SBP < 120 mmHg or if taken erectile dysfunction drug in past 72 hours.

EMT STOP

AEMT

- Initiate two IVs, either NS KVO or saline trap.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- 12 Lead EKG. IF CONFIRMED STEMI, FOLLOW CONFIRMED STEMI PROTOCOL.
- If MAP < 90 mmHg (see chart below), initiate Dopamine infusion at 5 mcg/kg/min, (see appendix) and titrate to keep MAP between 90 and 100 mmHg. (See chart below.)

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Metoprolol 5 mg slow IV May repeat q 5 mins to a total of 3 doses (15 mg), if available.
- Additional sedation with appropriately dosed benzodiazepine
- Diversion to a PCI capable hospital

Key Points/Considerations

- Acquisition of a 12 Lead ECG as soon as possible after ROSC will identify those patients who suffered cardiac arrest due to an MI and should be taken to a PCI capable hospital if medical control agrees.

Determining MAP

If your Systolic is	And your Diastolic is	The MAP is at least
110	80	90
120	75-90	90-100
130	70-85	90-100
140	65-80	90-100

$$\text{Or MAP} = \frac{\text{Systolic} + 2\text{X Diastolic}}{3}$$

Medical: ALLERGIC REACTION / ANAPHYLAXIS

EMT

- Initiate oxygen therapy / BVM assist as necessary.
- Monitor pulse oximetry (if available).
- Follow BLS epi pen protocol if credentialed.
- Transport and intercept with ALS enroute to the Emergency Department.

EMT STOP

AEMT

- Advanced airway procedure as needed
- Initiate IV access if severe respiratory distress.
- Administer Normal Saline 500 mL bolus as needed for hypotension. Reassess and repeat as needed.
- If wheezing present, administer Albuterol 2.5 mg in 3 mL unit dose nebulized. May repeat two additional times as needed.
- If severe respiratory distress, signs of shock or facial/throat edema, administer Epinephrine 0.3 mg (0.3 mL of 1:1000) IM.

AEMT STOP

CCT

PARAMEDIC

- Diphenhydramine 50 mg IV or IM (Hold if patient self-administered oral or may add to dose to equal 50 mg.)
- Methylprednisolone 125 mg IV or Prednisone 50 mg PO

CCT/PARAMEDIC STOP

PHYSICIAN OPTIONS

- Epinephrine (1:1000) 0.3 – 0.5 mg IM; May repeat Q5 min prn
- Epinephrine infusion 1:10,000; Mix 1 mg in 250 mL normal saline bag. Run wide open until breathing improves then stop.
- Dopamine 10 mcg/kg/min Titrate to SBP > 100 mmHg with max 20 mcg/kg/min.
- If available: Cimetidine 300 mg IV or IM; Famotidine 20 mg IV; or Ranitidine 50 mg IV or IM
- Methylprednisolone 125mg IM

Key Points/Considerations

- Use Epinephrine with caution in patients over the age of 55, those with a history of hypertension, and those with a prior cardiac history.

Medical: ALTERED MENTAL STATUS

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Check glucose level, if credentialed. If abnormal, refer to Diabetic Emergencies protocol.
- Consider need for spinal immobilization as appropriate.
- Consider all possible causes and refer to appropriate protocol:
  - Diabetic Emergencies
  - Seizure
  - Stroke
  - Trauma
  - Overdose or Toxic Exposure
  - Carbon Monoxide Exposure

EMT STOP

AEMT

CCT

PARAMEDIC

- Vascular access and, if possible, bloods drawn
- Consider and follow appropriate protocol

AEMT, CC AND PARAMEDIC STOP

PHYSICIAN OPTIONS

Key Points/Considerations

- All patients with an altered mental status should have timely transport to the hospital.

Medical: DIABETIC EMERGENCIES

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Check glucose level, if credentialed. If normal, refer to Altered Mental Status protocol.
- If blood glucose is known or suspected to be low, and patient is able to swallow on command, give oral glucose, one unit dose (19-24 grams), or available carbohydrate source.
- If blood glucose is CONFIRMED to be high, do not administer oral glucose.
- Call for ALS intercept if unable to swallow on command, or mental status remains altered following administration of oral glucose.

EMT STOP

AEMT

- Vascular access and, if possible, bloods drawn
- If glucose level is below 60 and the patient is symptomatic, administer Dextrose 50% 25 g IV. May re-dose if hypoglycemia recurs during transport. If not symptomatic, administer oral glucose.
- If glucose level is above 400, administer Normal Saline 500 mL IV bolus.
- If unable to obtain vascular access, Glucagon 1 mg IM, SC or atomized IN.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Administer Thiamine 100 mg IV before D50 ONLY if known chronic alcohol dependence.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Normal Saline IV bolus, if patient is hyperglycemic
- Additional Dextrose 50%, if patient is hypoglycemic

Key Points/Considerations

- If the patient wishes to refuse transportation to a hospital and you have administered any medications, you must contact Medical Control prior to leaving the patient or completing the RMA.
- If the patient's blood glucose level is below 60 and the patient is able to swallow on command, administer oral glucose or equivalent rather than establishing vascular access, if possible.
- If a patient on an insulin pump develops symptomatic hypoglycemia, ask the patient or family to turn off or disconnect the insulin pump until blood sugar stabilizes.

Medical: SEIZURES

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- **Check blood glucose level**, if credentialed. If abnormal, refer to Diabetic Emergencies protocol.

EMT STOP

AEMT

- Vascular access and, if possible, bloods drawn

AEMT STOP

CRITICAL CARE

PARAMEDIC

- If female patient pregnant and over 20 weeks gestation **OR** up to 6 weeks postpartum **AND** no history of seizures, administer Magnesium Sulfate 4 gm in 100 mL NS over 5 minutes IV/IO. May follow with Benzodiazepine as below for refractory seizure activity
- Administer Benzodiazepine if actively seizing or in pregnant female nonresponsive to magnesium administration. May repeat dose once in 5 minutes without delaying transport if seizures persist:
  - Midazolam (Versed) 2.5 mg IV/IO or 5 mg IM/IN **OR**
  - Diazepam (Valium) 5 mg IV/IM/IO **OR**
  - Lorazepam (Ativan) 2 mg IV/IM/IO

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Benzodiazepine doses
- Magnesium Sulfate 4 gm in 100 mL NS over 5 minutes IV/IO for maternity patient with unknown seizure history or length of gestation

Key Points/Considerations

- Protect the patient and EMS crew from injury during the seizure.
- Standing orders are for tonic/clonic seizures (grand mal seizures) only.
- All levels must contact medical control before administration of Benzodiazepine if Diastat (Diazepam) was administered PTA.
- Pre-eclampsia is defined as BP greater than 140/90 in a pregnant patient or one who has recently given birth. Signs and symptoms include severe headache, confusion and/or hyper-reflexia.
- Eclampsia is signs/symptoms of pre-eclampsia with seizure activity.

Medical: STROKE

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Check blood glucose level, if credentialed. If abnormal, refer to Diabetic protocol.
- Request ALS if available. DO NOT DELAY transport to appropriate hospital.
- Establish time of onset (time last seen "NORMAL").
- Perform Cincinnati pre-hospital stroke scale:
  - Assess for facial droop: have the patient show teeth or smile.
  - Assess for arm drift: have the patient close eyes and hold both arms straight out for 10 seconds.
  - Assess for abnormal speech : have the patient say, " *You can't teach an old dog new tricks*".
- Transport the patient to the closest New York State Department of Health designated Stroke Center of patient choice, if the total prehospital time (time from last seen "NORMAL" to when the patient is expected to arrive at the Stroke Center) is less than 2 hours.
- Transport patient to the closest appropriate hospital IF:
  - The patient is in cardiac arrest.
  - The patient has an unmanageable airway.
  - The patient has other medical conditions that warrant transport to the closest appropriate hospital.

EMT STOP

AEMT

CCT

PARAMEDIC

- Vascular access with blood drawn

AEMT, CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Diversion of ambulance to more appropriate facility

Key Points/Considerations

- Notify the receiving hospital as soon as possible of your impending arrival with an acute stroke patient, Cincinnati Stroke Scale findings, and time last "NORMAL".

Medical: OVERDOSE or TOXIC EXPOSURE

EMT

- Decontamination as needed
- ABC and vital signs
- Airway management and appropriate oxygen therapy
- For envenomation:
  - Determine species of animal if possible.
  - Determine timeline.
  - Contact Medical Control for destination.
  - Splint extremity in position of full extension.
  - DO NOT apply constricting bands.
- If ingestion, determine what was taken, when and how much.
- Check blood glucose level, if equipped. If level is < 60, refer to Diabetic Emergency protocol.
- For symptomatic patients with suspected Opiate overdose: Naloxone 2mg IN

EMT STOP

AEMT

- Vascular access with blood drawn
- If hypotensive, administer Normal Saline 500 mL fluid bolus.
- For symptomatic patients with:
  - Opiate overdose: Naloxone (Narcan) 0.4 mg IV, may repeat to titrate to adequate ventilation (max of 2mg). If unable to establish IV, give Naloxone 2mg SQ, IM, IO or IN

AEMT STOP

CRITICAL CARE

PARAMEDIC

- 12 Lead EKG if bradycardic or tachycardic (for QRS widening or QT prolongation)
- For symptomatic patients with:
  - Organophosphate poisoning: Atropine 2 mg IV per dose until secretions dry
  - Dystonic reaction: Diphenhydramine (Benadryl) 50 mg IV or IM

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Calcium channel blocker OD: Glucagon 2 mg IV, (or) Calcium Chloride 1 gram IV
- Beta blocker OD: Glucagon 2 mg IV, (or) Calcium Chloride 1 gram IV
- Tricyclic antidepressant OD: Sodium Bicarbonate 1 mEq/kg IV until QRS complex narrows below 100 mSec
- Sympathomimetic OD (cocaine/amphetamines): Midazolam (Versed) 2.5 mg IV/IO or 5 mg IM/IN
- Organophosphate: (EMT) Atropen 2 mg IM per dose, repeat until secretions dry if available

Key Points/Considerations

- Includes patients who are unconscious/unresponsive without suspected trauma
- Only administer Naloxone to suspected opiate overdose with hypoventilation. For provider and patient safety, do not administer if there are adequate ventilations without physician order.
- Dystonic reaction S/S include uncontrolled muscle contractions of face, neck or tongue.
- Use the SLUDGE mnemonic for identification of organophosphate poisoning.
- Calcium channel and beta blocker OD signs includes hypotension or symptomatic bradycardia.
- Tricyclic OD signs includes QRS > 0.10 or systolic BP <90.
- EMS personnel cannot receive Medical Direction from Poison Control Center.

Medical: SHOCK / HYPOPERFUSION

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Place patient in supine position unless dyspnea is present.

EMT STOP

AEMT

- Vascular access
- If no pulmonary edema:
  - Additional vascular access
  - Normal Saline 500 mL bolus IV. Check lung sounds. May repeat NS bolus if lung sounds unchanged.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- 12 Lead EKG
  - IF CONFIRMED STEMI, FOLLOW CONFIRMED STEMI PROTOCOL.
- If clinical picture fits sepsis, continue Normal Saline IV up to a total of 2 liters. Consider vasopressors for hypoperfusion that persists after administration of 2 liters of Normal Saline.
- If clinical picture fits AAA, gastrointestinal bleeding, myocardial infarction, or ectopic pregnancy, administer Normal Saline IV in 250 mL boluses to keep systolic BP between 90 and 100 mmHg.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Normal Saline IV bolus
- Dopamine infusion 5 - 20 micrograms/kg/minute
- Epinephrine infusion 2 - 10 micrograms/minute

Key Points/Considerations

- Hypoperfusion is defined as systolic BP < 90 mmHg or MAP < 65 mmHg and/or decreased level of consciousness.
- Consider potential causes of hypoperfusion: anaphylaxis, toxic ingestions, cardiac rhythm disturbances, myocardial infarction, sepsis, ruptured AAA, ectopic pregnancy, or others.
- Consider potential sepsis and assure notification of the receiving facility upon arrival at the bedside.

Medical: ADRENAL CRISIS

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy

EMT STOP

AEMT

- IV access and bloods drawn
- Normal Saline 1 L bolus

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Hydrocortisone 100 mg IV or IO if available;
  OR
- Methylprednisolone 125 mg IV, or IO

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Repeat fluid bolus of 1 L Normal Saline.
- Confirm medical history prior to steroid administration.

Key Points/Considerations

- Adrenal crisis is due to the body's inability to cope with shock due to lack of appropriate cortisol production.
- Adrenal crisis can occur from stress from medical or trauma etiologies.
- Adrenal crisis can present in the following conditions: Congenital Adrenal Hypo/Hyperplasia, Addison's Disease, Adrenal tumors.
- Patients will be on replacement medications (Hydrocortisone, Fluticortisone, Methylprednisolone) on a daily basis.
- Rapid steroid administration in patients with these conditions can be lifesaving.
- Hydrocortisone is preferred medication.
- Patients are often well versed in their condition and input from the patient may be very valuable.
- Patient may have dose of Hydrocortisone on site. EMS may help administer patient's own steroid medication based on protocol.
- This protocol should NOT be used unless patient is CONFIRMED to have one of the above conditions by patient/family or medic alert bracelet/necklace/card.
- There is little risk in steroid administration to these patients, but if any question, contact Medical Control.

MEDICAL: EXCITED DELIRIUM SYNDROME

EMT

- ABC's
- Apply supplemental oxygen
- Check glucose if credentialed
- Monitor pulse oximetry (if available)
- Consider alternative conditions for altered mental status using the acronym "AEIOU TIPS"
- For tactile hyperthermia remove clothing and apply icepacks to head, neck, axilla and groin
- Call for ALS backup

EMT STOP

AEMT

- Establish vascular access
- Administer 1000ml saline bolus
  - If hyperthermia exists – chilled saline (if available) <60 °

AEMT STOP

CRITICAL CARE

- Continuous cardiac monitoring
- Administer Benzodiazepine
  - Midazolam (Versed) 5mg IM or 2.5mg IV **OR**
  - Diazepam (Valium) 10mg IM or 5mg IV **OR**
  - Lorazepam (Ativan) 4mg IM or 2mg IV **OR**

Critical Care STOP

PARAMEDIC

- Administer Benzodiazepine as above **OR**
  - Ketamine 2mg/kg IV or 4mg/kg IM (max dose 400mg)

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Saline Boluses
- Additional administration of benzodiazepine IV or IM
- Sodium Bicarbonate 50 mEq IV

Key Points/Considerations

- Most common pre-hospital (potential) features: high pain tolerance, tachypnea, sweating, agitation, tactile hyperthermia, non-compliance, lack of tiring, unusual strength
- Adequate physical control should be obtained first - Do not attempt to restrain or control severely agitated patients – always request police assistance
- Several different potential underlying causes including stimulant drug abuse (especially cocaine), psychiatric disease, psychiatric drug withdrawal, and metabolic disorders
- Hyperventilation is the bodies physiological reaction to acidosis - Caution with use of repeated doses of benzodiazepines as this has potential to blunt the compensatory respiratory mechanism
- "AEIOU TIPS" -

- Alcohol	- Toxins/Trauma/Temperature
- Endocrine/Encephalopathy	- Infection
- Insulin (hypoglycemia)	- Psychiatric
- Oxygen (Hypoxia)	- Stroke/Shock/Subdural Hemorrhage
- Uremia	

Trauma: GENERAL CONSIDERATIONS

Key Points/Considerations

- Trauma Arrest patients and patients with an unstable airway shall be transported to the nearest emergency department.
- UNSTABLE patients should be enroute to the hospital/landing zone within 10 minutes of disentanglement/extrication.
- A pregnant female less than 20 weeks gestation should be transported to the closest appropriate adult facility in accordance with the Trauma Triage Guidelines (see Appendix). Pregnant females greater than 20 weeks who do not meet Major Trauma criteria may be transported to the ED at the hospital the patient intends to deliver. ALL PREGNANT WOMEN GREATER THAN 20 WEEKS GESTATION WHO MEET MAJOR TRAUMA CRITERIA **MUST** BE TRANSPORTED TO THE ADULT TRAUMA CENTER IN ACCORDANCE WITH THE GUIDELINES.
- All other major trauma patients should be transferred to an appropriate Trauma Center:
  - If more than 30 minutes from a Trauma Center consider aeromedical assistance. Refer to the Aeromedical Utilization Policy.
  - If the time from injury to arrival at the trauma center is likely to be more than 60 minutes, contact Medical Control and consider transporting patient to the nearest hospital.
- All times start at the time the EMS provider determined the patient to meet major trauma criteria.
- Notify the receiving facility as early as possible giving brief description of mechanism of injury, patient status, and estimated time of arrival.
- Do not use MAST unless bilateral femur fractures are suspected and no traction splint is available or an unstable pelvic fracture is suspected. In these situations, inflate only as needed to stabilize the fracture. Do NOT use on pediatric patients less than 8 years old.
- Consider appropriate analgesia and nausea management.
- Regional trauma centers are listed on the WREMAC web site (**http://www.wremac.com**).

Trauma: BURN CARE CONSIDERATIONS

Key Points/Considerations

- Be alert for other injuries, including cardiac dysrhythmias.
- Be alert for smoke inhalation.
- Assure high flow oxygen as oxygen saturation readings may be falsely elevated in the presence of carbon monoxide.
- If hazardous materials, notify the destination hospital immediately to allow for decontamination.
- When considering total area of a burn, DO NOT count first degree burns.
- Burns are only to be dressed with simple sterile dressings.
- Burns to eye should be immediately irrigated with saline.

Transportation Considerations

- Burns associated with trauma should go to the closest age appropriate trauma center.
- If there is any question about the appropriate destination of a patient consult MED CONTROL.
- Consider transport to a burn center if:
  - >10% BSA partial thickness burns
  - Involvement of face, hands, feet, genitalia, or major joints
  - Third degree burns
  - Electrical burns, including lightning injuries
  - Chemical burns
  - Inhalation injury

BURN CENTERS

- Refer to WREMAC Web Site.

DIFFERENTIAL

- Superficial (1st Degree) – red and painful
- Partial Thickness (2nd Degree) – blistering and painful
- Full Thickness (3rd Degree) – painless/charred or leathery skin
- Electrical Burns – Make note of AC/DC current, voltage/amperage; anticipate cardiac arrhythmias.
- Chemical Burns – Use copious irrigation and notify receiving facility of possible contaminant. Obtain information on the specific chemical. Tissue damage from Hydrofluoric Acid can cause life threatening dysrhythmias from hypocalcemia.

Trauma: BURN MANAGEMENT

EMT

- Stop the burning. Remove any clothing, jewelry, etc.
- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Consider aeromedical intercept for direct transport to a Burn Center.
  (See Trauma: Burn Center Transport Criteria)
- If the burn is less than 10% BSA, use moist sterile dressings.
- If the burn is more than 10% BSA, use dry sterile dressings.
- Burns to the eye require copious irrigation with Normal Saline — do not delay irrigation.

EMT STOP

AEMT

- Vascular access at 2 sites
- Normal saline 80-100 mL/hr
- During fluid resuscitation, remember trauma takes priority over burns; IVF bolus as necessary to maintain BP > 90mmHg.
- If patient has signs of airway involvement, be prepared for advanced airway procedure.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Refer to Pain, Nausea and Sedation Management protocol.
- For chemical exposure to the eye(s): Irrigate affected eye with normal saline.

CCT / PARAMEDIC STOP

PHYSICIAN OPTIONS

- Morphine 0.1 mg/kg IV or IM
- Fentanyl 0.5-1 mcg/kg slow IV, IM or atomized intranasal
- Additional intravenous fluid

Key Points/Considerations

- Observe the patient for hypothermia. Maintain a normal body temperature.

Trauma: CHEST

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- If sucking chest wound, cover with occlusive dressing. If dyspnea increases, release the dressing momentarily during exhalation.
- Contact receiving hospital as soon as possible.
- DO NOT place hemostatic agents into open torso wounds.

EMT STOP

AEMT

- If patient is in cardiac arrest; consider needle decompression bilaterally
- Needle decompression if patient has signs and symptoms consistent with Tension Pneumothorax
- Vascular access; use the side opposite the injury if possible.
- Normal saline per the Traumatic Hypoperfusion protocol

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Refer to PAIN MANAGEMENT Protocol

CCT and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Morphine 0.1 mg/kg IV or IM
- Fentanyl 1-1.5 mcg/kg IV, IM or atomized intranasal
- Additional fluid

Key Points/Considerations

- Begin transportation as soon as possible and perform ALS treatment enroute to the hospital.
- Penetrating chest trauma is a contraindication for use of Anti-Shock Trousers (MAST).
- Signs and symptoms of a Tension Pneumothorax: absent lung sounds on one side, extreme dyspnea, jugular vein distention (JVD), cyanosis or hypoxia (even with high flow oxygen), tracheal deviation AND hypotension
- Hemodynamic compromise is defined as hypotension, narrowed pulse pressure and tachycardia.
- Needle decompression is a serious medical intervention that requires a chest tube in the hospital.

Trauma: CRUSH INJURY

EMT

- ABC and vital signs every 5 minutes if possible
- Airway management and appropriate oxygen therapy.
- Consider early ALS activation if anticipated extrication is more than 15 minutes.
- If ALS is not available and the limb has been entrapped for two hours or more, apply a tourniquet as close as possible to the site of crush injury prior to release of the extremity.

EMT STOP

AEMT

- Vascular access at 2 sites
- Normal saline (preferably warmed) 1 liter IV bolus

AEMT STOP

CRITICAL CARE

PARAMEDIC

- 12 Lead EKG repeated at 30 minute intervals if feasible and does not compromise provider safety
- If 1 complete extremity crushed more than 2 hours or 2 extremities crushed more than 1 hour, prior to release of the entrapped limb(s):
  - prior to extrication insure the patient received 2 liters of normal saline.
  - One minute prior to release, administer Sodium Bicarbonate 1 mEq/kg IV bolus (max 100 mEq).
- If the patient develops peaked T waves or prolongation of the QT or QRS on ECG, suspect hyperkalemia and contact medical control. Transmit the 12-lead ECG if possible.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- If hyperkalemia is suspected:
  Calcium Chloride 1 gram IV (over 5 minutes). Repeat in 10 minutes if no resolution.
  Albuterol 2.5 mg in 3 mL (unit dose) via nebulizer. Repeat as needed.
  Sodium bicarbonate (50 mEq mixed in 1 liter Normal Saline). Run at 1.5 Liters per hour.
- Midazolam (Versed) 0.05 mg/kg IV, IM or atomized intranasal
- Morphine 0.1 mg/kg IV or IM
- Fentanyl 0.5-1 mcg/kg IV, IM or atomized intranasal

Key Points/Considerations

- Contact the Regional Trauma Center early and consider physician presence at scene if prolonged extrication anticipated.
- Use one dedicated IV for Sodium Bicarbonate, the other IV for all other medications.
- Hyperkalemia is indicated by PVCs, peaked T-waves or widened QRS complexes.
- After extrication, immobilize the extremity and apply cold therapy. Do not elevate the extremity.

Trauma: HEAD INJURY

EMT

- ABC and vital signs (including pulse oximetry if available)
- Airway management and appropriate oxygen therapy to keep oxygen saturation above 90%
- C-Collar and Spinal Immobilization
- Apply pressure dressing to scalp lacerations.
- Obtain and record GCS.
- Check blood glucose, if credentialed.
- Contact receiving hospital as soon as possible.

EMT STOP

AEMT

- Vascular access
- Normal saline per Traumatic Hypoperfusion protocol
- Follow Airway protocol for GCS < 8
- Ventilate at an appropriate rate to maintain end tidal CO2 between 30 and 35 if signs of increased ICP.
- Administer 25 gm D50 IV bolus or glucagon if glucose < 60.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- If patient seizes, follow Seizure protocol.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Diazepam 5mg IV or IM
- Lorazepam 2mg IV or IM
- Midazolam 2 mg IV, IM or IN
- Additional Fluid

Key Points/Considerations

- In non-intubated patients hyperventilate (Adult 20 bpm, Child 30, Infant 35) only if ongoing evidence of brain herniation (fixed and dilated pupil, decorticate/decerebrate posture, or bradycardia).
- Watch for signs of increased intracranial pressure including hypertension and bradycardia.
- Hypotension usually indicates injury or shock unrelated to head injury and should be aggressively treated with a goal to maintain the systolic blood pressure greater than 110mmHg.
- Most important item to document and monitor is level of consciousness.

Trauma: EXTREMITY

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Wound care per NYS BLS protocols
- Control hemorrhage with direct pressure; ***consider tourniquet, then hemostatic agent for life threatening bleeding.***
- Wrap amputated part in sterile saline soaked dressing and place in airtight container and put the container on ice if possible.

EMT STOP

AEMT

- Vascular access
- Normal saline per the Traumatic Hypoperfusion protocol

AEMT STOP

CCT

PARAMEDIC

- Refer to PAIN MANAGEMENT and CRUSH INJURY protocols.

CCT and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Morphine 0.1 mg/kg IV or IM
- Fentanyl 1-1.5 mcg/kg IV, IM or atomized intranasal
- Additional Fluid

Key Points/Considerations

- Urgently transport any patient with vascular compromise (hip, knee, elbow fracture/dislocations).
- Consider anti-shock MAST trousers for unstable pelvic fractures.

Trauma: HYPOPERFUSION

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy

EMT STOP

AEMT

CCT

PARAMEDIC

- Vascular access
- If hemorrhage is from a compressible site **AND** has been controlled, administer Normal Saline up to 2 liters IV to a systolic blood pressure goal of above 120 mmHg.
- If hemorrhage from non-compressible site is suspected (e.g. internal bleeding) **OR** is from a compressible site that is not controlled, administer Normal Saline in 250 mL boluses to a goal of a palpable radial pulse and reassess.

AEMT, CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Normal Saline
- Dopamine 5-20 micrograms/kg/min IV

Key Points/Considerations

- COMPENSTATED SHOCK is defined as significant mechanism of injury AND tachypnea, tachycardia, pallor, or restlessness, AND Systolic BP greater than 90 mmHg.
- DECOMPENSATED SHOCK is defined as clinical picture of shock AND Systolic BP less than 90 mmHg.
- A falling BP is a LATE sign of shock.
- Contact receiving hospital early, with “Trauma Alert” call, giving brief description of mechanism of injury, status of patient and estimated time of arrival.

ADULT PAIN / NAUSEA / SEDATION

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Apply ice, elevation and immobilization of injured limb or area.

EMT STOP

AEMT

- SaO2 monitor
- Vascular access prn if analgesia is anticipated.
- If nauseous, Normal Saline 500 mL bolus IV if no contraindications for fluid administration.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Consider monitoring sidestream capnography (if available) for procedural sedation.
- Consider 12 lead ECG if profound nausea or vomiting.
- Analgesia:
  - Morphine 0.1 mg/kg IV, IO, IM up to 5mg. May be repeated in 5 min with total not to exceed 10 mg. (SEE KEY POINTS BELOW) **OR**
  - Fentanyl 50 mcg slow IV, IO, IM, or IN. May be repeated in 5 min with total not to exceed 100 mcg. **OR**
  - Ketorolac 30 mg IV, IO or IM once (do not use if history of bleeding disorder or renal disease, current pregnancy or age over 65)
- Nausea:
  - Ondansetron (Zofran) 4 mg IV, IO, IM, or PO . May repeat once in 10 minutes if needed.
- Sedation (**for a painful procedures only – not for chemical restraint**):
  - Midazolam (Versed) 2.5 mg IV/IO or 5 mg IM/IN. May repeat once as needed. **OR**
  - Diazepam 5 mg IV, IO, IM. May repeat once as needed. **OR**
  - Lorazepam 2 mg IV, IO, IM. May repeat once as needed.
- Diphenhydramine (Benadryl) 25 mg IV or IM once prn for itching or for motion sickness

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Morphine IV or IM or Fentanyl IV, IO, IM, or IN
- Additional Ondansetron (Zofran) IV or IM
- Additional Midazolam, Diazepam, or Lorazepam IV, IM, or IN

Key Points/Considerations

- Contraindications to standing order pain management: altered mental status, hypoventilation, SBP<100
- Fentanyl should be used if there is any concern for potential hemodynamic instability.
- If administered rapidly and in very large doses, fentanyl can cause muscle spasm and chest wall rigidity. The only reliable treatment for this is neuromuscular blockade.
- The ADULT PAIN / NAUSEA / SEDATION protocol should be utilized for ongoing sedation and pain management of patients who are already intubated. However, this policy may not be used to facilitate intubation. Appropriately credentialed providers should utilize the MFI Protocol to facilitate intubation.

Pediatric: GENERAL MANAGEMENT

- For these protocols, pediatric patients are defined as children less than 14 years of age or before obvious signs of puberty (facial hair, acne, axillary hair, breast development). There may be overlap between pediatric and adult protocols in treating patients 10-14 years old.
- Procedures for Paramedics and Critical Care Technicians are only for the following clinical situations:
  - Cardiac or Respiratory Arrest
  - Cardiac Dysrhythmias (Bradycardia, Supraventricular Tachycardia)
  - Asthma/Acute Bronchospasm
  - Anaphylaxis/Allergic Reaction
  - Seizures
  - Pain Management
  - Altered Mental Status/Overdose
  - Diabetic Emergencies
  - Major Trauma
  - Hypoperfusion
  - Neonatal Resuscitation
- In all other clinical situations you must contact Medical Control.
- Have a length based resuscitation tape or similar device available to accurately determine the correct medication dosage.
- Agencies may only perform endotracheal intubation, if they are equipped with continuous waveform capnography.
- Pediatric vascular access should only be initiated, if there is an intervention to perform such as a fluid bolus or medication administration. “Prophylactic” access should not be initiated in children.
- Normal Vital Signs for Infants and Children:

Age	Respirations	Pulse	Systolic BP
Newborn	30 – 60	100 – 180	>60
Infant (< 1 year)	30 – 60	100 - 160	>60
Toddler (1 – 3 years)	24 – 40	90-150	>70
Preschooler (3 – 5 years)	22 – 34	80-140	>75
School-aged (6 – 8 years)	18 – 30	70-120	>80

From: American Academy of Pediatrics, Pediatric Education for Prehospital Professionals

- Transport all patients appropriately restrained. All children weighing less than 40 lbs shall be restrained with an approved child restraint. Do not allow parent to hold the child while the parent is seated on the ambulance cot.
- Do not transport a pediatric patient who meets Major Trauma criteria in the car seat involved in the crash.
- If a maximum dose is not listed for a medication, use the adult dose for that medication as the maximum dose.

Procedure: PEDIATRIC AIRWAY MANAGEMENT

EMT

- Assist ventilations with bag valve mask with oxygen if available (room air is acceptable to start).
- Consider CPAP for a spontaneously breathing patient > 10 years old, if indicated and appropriately credentialed by medical director (See PROCEDURE: CONTINUOUS POSITIVE AIRWAY PRESSURE).
- Call for ALS intercept enroute to the closest Emergency Department.

EMT STOP

AEMT

- Consider advanced airway if CC/Paramedic care delayed.
- Needle Decompression if signs and symptoms consistent with Tension Pneumothorax

AEMT STOP

CRITICAL CARE

- Endotracheal intubation (cervical spine precautions prn) and monitor with continuous waveform capnography (max 2 attempts total), **OR** FDA approved supraglottic airway device
- Consider topical anesthetic spray or jelly prior to intubation/supraglottic airway placement.
- ***If unable to intubate, place a supraglottic airway, or just ventilate the patient or perform needle cricothyrotomy.***

CC STOP

PARAMEDIC

- If patient is older than 15 years old OR has obvious signs of puberty, may perform Medicated Facilitated Intubation procedure, if credentialed by service medical director (see Medication Facilitated Intubation protocol).

PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional intubation attempts by more experienced or higher level provider
- Needle thoracostomy if tension pneumothorax is present

Key Points/Considerations

- Signs of a tension pneumothorax requiring needle thoracostomy include unilateral loss of breath sounds, hypotension, hypoxia, penetrating or evidence of blunt chest trauma on the affected side, distended jugular veins, and tracheal deviation away from the affected side (late sign).
- Confirm endotracheal tube placement with auscultation and continuous waveform capnography.
- Maintain continuous waveform capnography until the patient is placed onto the ED stretcher.

Pediatric: PEDIATRIC CARDIAC ARREST

EMT

- Start CPR:
  - Compress chest $\geq$ $^{1}/_{3}$ of anterior-posterior diameter at least 100/min.
  - Rotate compressor every 2 minutes between pulse/rhythm checks.
  - Avoid excessive ventilations.
  - 30:2 ratio if a single provider is administering CPR; 15:2 compression:ventilation for two rescuers administering CPR and no advanced airway
  - Continuous compression if advanced airway is in place with 8-10 ventilations/minute
- Minimize interruptions in compressions.
- Follow AED protocol.

EMT STOP

AEMT

- After AED shock (if administered), obtain IV or IO access.
- Continue CPR for 2 minutes between pulse/rhythm checks.
- Consider advanced airway if CC/Paramedic care delayed.
  - 8-10 ventilations/minute if advanced airway placed

AEMT STOP

CRITICAL CARE

PARAMEDIC

- If the patient has return of spontaneous circulation, continue to support breathing and circulation and contact medical control.
- If the patient is in ventricular fibrillation/pulseless ventricular tachycardia, go to the VENTRICULAR FIBRILLATION/PULSELESS VENTRICULAR TACHYCARDIA protocol.
- If the patient is in PEA/Asystole, go to the PEA/ASYSTOLE protocol.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Termination of resuscitation attempt
- BLS Rule: Consider termination if all of the following criteria have been met:
  - Unwitnessed arrest
  - No bystander CPR
  - No return of spontaneous circulation after 3 rounds of CPR/AED shocks
  - No shock was delivered after 3 rounds of CPR

Key Points/Considerations

- ROSC is often indicated by sharp rise in EtCO2 to over 40 mmHg before pulse is palpable.
- If EtCO2 is below 20, focus on improving the quality of chest compressions.

Pediatric: PEDIATRIC CARDIAC ARREST – VF/PULSELESS VT

CRITICAL CARE

PARAMEDIC

- If persistent VF/pulseless VT:
  - Defibrillate 2 J/kg.
  - Continue CPR for 2 minutes.
  - Obtain IV/IO access (if not already obtained).
  - Defibrillate 4 J/kg.
  - CPR for 2 minutes.
  - Epinephrine 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration) IV/IO every 3 – 5 minutes
  - Consider advanced airway, monitor with waveform capnography, and ventilate at 8-10 ventilations per minute (1 breath every 6-8 seconds).
  - Defibrillate ≥ 4 J/kg (max 10 J/kg or adult dose) immediately following CPR for 2 minutes.
  - If rhythm is Torsades, administer Magnesium 25 – 50 mg/kg (maximum single dose of 2 grams) IV/IO push.
  - If rhythm is VF/non-Torsades VT, administer Amiodarone 5 mg/kg bolus (may repeat up to 2 times for refractory VF/pulseless VT).
  - Assess for and treat reversible causes.
  - Continue sequence: Shock (≥ 4 J/kg or adult dose), CPR (2 minutes), Drug (as appropriate).

- If rhythm not persistent VF/pulseless VT:
  - If return of spontaneous circulation (ROSC), contact medical control.
  - If PEA/Asystole, go to Pediatric Cardiac Arrest PEA/Asystole protocol.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Termination of resuscitation attempt

Key Points/Considerations

- Reversible causes include hypovolemia, hypoxia, acidosis, hypo/hyperkalemia, hypothermia, tension pneumothorax, cardiac tamponade, toxic, pulmonary embolus.
- ROSC is often indicated by sharp rise in EtCO2 to over 40 mmHg before pulse is palpable.
- If EtCO2 is below 20, focus on improving the quality of chest compressions.

Pediatric: PEDIATRIC CARDIAC ARREST – PEA/ASYSTOLE

CRITICAL CARE

PARAMEDIC

- If persistent PEA/Asystole
  - Continue CPR for 2 minutes.
  - Epinephrine 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration) IV/IO every 3 – 5 minutes
  - Consider advanced airway, monitor with waveform capnography, ventilate at 8 – 10 breaths/min.
  - CPR for 2 minutes
  - Consider reversible causes.
  - Continue above. If no response to therapy after 20 minutes and EtCO2 is less than 10 mmHg,
    - Contact MC for termination of resuscitation
    - Provide support to family/bystanders
- If rhythm not persistent PEA/Asystole:
  - If return of spontaneous circulation (ROSC), go to Post Cardiac Arrest Care protocol.
  - If VF/Pulseless VT, go to Adult Cardiac Arrest VF/Pulseless VT protocol.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Termination of resuscitation attempt

Key Points/Considerations

- Reversible causes include hypovolemia, hypoxia, acidosis, hypo/hyperkalemia, hypothermia, tension pneumothorax, cardiac tamponade, toxic, pulmonary embolus.
- ROSC is often indicated by sharp rise in EtCO2 to over 40 mmHg before pulse is palpable.
- If EtCO2 is below 20, focus on improving the quality of chest compressions.

Pediatric: SYMPTOMATIC BRADYCARDIA

EMT

- Oxygen administration with non-rebreather mask
- Call for ALS intercept enroute to the closest Emergency Department.
- Begin CPR if heart rate < 60/min with cardiopulmonary compromise (hypotension, acute altered mental status, signs of shock).

EMT STOP

AEMT

- Advanced airway management as appropriate
- IO/IV access

AEMT STOP

CRITICAL CARE

PARAMEDIC

- If persistent bradycardia, give Epinephrine 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration) IV/IO every 3 – 5 minutes.
- Epinephrine 0.1 mg/kg (0.1 mL/kg of 1:1,000 concentration) ET if IV/IO unsuccessful. One dose only.
- Atropine for increased vagal tone or primary AV block only
  - 0.02 mg/kg IV/IO bolus, may repeat once (minimum dose is 0.1 mg; maximum single dose is 0.5 mg)
- If atropine is ineffective:
  - Transcutaneous pacing
  - Consider sedation (follow Pediatric Pain, Nausea and Sedation protocol).

CC and PARAMEDIC STOP

Key Points/Considerations

- If bradycardia is not symptomatic (i.e. does not cause hypoperfusion, hypotension, altered mental status, chest pain, difficulty breathing, or acute heart failure), close patient monitoring is the only therapy indicated.

Pediatric: TACHYCARDIA WITH A PULSE

EMT

- Oxygen administration with non-rebreather mask if SaO2 < 95% or signs of respiratory distress
- Call for ALS intercept enroute to the closest Emergency Department.

EMT STOP

AEMT

- Advanced airway management as appropriate
- IV/IO access

AEMT STOP

CRITICAL CARE
PARAMEDIC

- If Narrow QRS Duration (≤ 0.09 sec), evaluate rhythm with 12 Lead ECG or monitor, don't delay treatment.
  - Probable Sinus Tachycardia[1]:
    - Search for and treat cause.
  - Probable Supraventricular Tachycardia[2]:
    - Consider vagal maneuvers (no delays)
    - Adenosine IO/IV rapid bolus:
      - First Dose: 0.1 mg/kg (maximum 6 mg)
      - Second Dose: 0.2 mg/kg (maximum 12 mg)
    - Synchronized Cardioversion if IV/IO access not available or Adenosine not effective:
      - Consider sedation (follow Pediatric Pain, Nausea and Sedation protocol)
      - First Synchronized Shock: 0.5 – 1 J/kg
      - Subsequent Shock (2 J/kg) – only if first shock is not effective
- If Wide QRS Duration (> 0.09 sec)
  - Possible Ventricular Tachycardia.
  - If cardiopulmonary compromise (hypotension, altered mental status, signs of shock), synchronize cardiovert.
    - Consider sedation (follow Pediatric Pain, Nausea and Sedation protocol)
    - First Synchronized Shock: 0.5 – 1 J/kg
    - Subsequent Shock (2 J/kg) – only if first shock is not effective
  - If no cardiopulmonary compromise, contact medical command.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- For regular rhythm, wide complex, monomorphic tachycardia without cardiopulmonary compromise consider:
  - Adenosine IO/IV rapid bolus: 1st Dose: 0.1 mg/kg (max 6mg); 2nd Dose: 0.2 mg/kg (max 12 mg)
  - Amiodarone IV/IO dose: 5 mg/kg over 30-60 minutes

Key Points/Considerations

1. Probable Sinus Tach: compatible history consistent with known cause; P-waves present/normal; variable R-R, constant P-R; Infant rate usually <220/min; Child rate usually <180/min.
2. Probable SVT: compatible history (vague, non-specific); history of abrupt rate changes; P-waves absent/abnormal; R-R not variable; Infant rate usually ≥220/min; Child rate usually ≥180/min.

Pediatric: ACUTE ASTHMA

EMT

- ABC, vital signs, and pulse oximetry if available
- Airway management and oxygen therapy
- Determine if patient has been given their own asthma medications.
- Follow BLS Nebulized Albuterol protocol.
- Consider CPAP for a spontaneously breathing patient > 10 years old, if indicated and credentialed by medical director (See PROCEDURE: CONTINUOUS POSITIVE AIRWAY PRESSURE).

EMT STOP

AEMT

- Albuterol 2.5 mg in 3 mL (unit dose) via nebulizer. Repeat to a total of three (3) doses.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Albuterol 2.5 mg in 3 mL (unit dose) mixed with Ipratropium 0.5 mg in 2.5 mL (unit dose), via nebulizer. Repeat to a total of three doses.

CC and PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- Albuterol 2.5 mg in 3 mL (unit dose), repeated prn if patient does not improve after 3 doses of Albuterol/Ipratropium mix
- Epinephrine (1:1,000) 0.01 mg/kg IM (max 0.3 mg)
- Epinephrine (1:1,000) 1 mg mixed with 2-3 mL Normal Saline, via nebulizer (for stridor associated with croup)
- Prednisone (if available) 2 mg/kg PO (maximum 60 mg) or methylprednisolone 2 mg/kg IV or IM (maximum 125 mg)
- Terbutaline 0.01 mg/kg SQ (maximum 0.25 mg)
- Magnesium sulfate 25 mg/kg over 10-20 minutes IV (maximum 2 grams)
- Normal Saline 2-3mL nebulized

Key Points/Considerations

- Wheezing, diminished breath sounds, or prolonged expiration when accompanied with respiratory distress are indications for medication administration.
- Absence of breath sounds can be indicative of status asthmaticus. Be prepared for imminent respiratory arrest.
- If stridor, excessive drooling, or barking cough present, suspect epiglottitis or croup. If epiglottitis suspected, do not intubate.
- Allow child to maintain position of comfort and remain with parent if possible.

Pediatric: SUSPECTED SMOKE INHALATION

EMT

- ABC, vital signs and pulse oximetry if available
- Airway management and oxygen therapy as indicated

EMT STOP

AEMT

- Normal saline 20 mL/kg if the patient is displaying signs of shock
- Albuterol 2.5 mg in 3 mL (unit dose) nebulized. Repeated as needed if wheezing, diminished breath sounds or has prolonged expiration up to a total of three (3) doses.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Sodium thiosulfate 400 mg/kg (1.5 mL/kg) IV over 10 minutes (maximum 12.5 g) for signs of cyanide toxicity

CC and PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- Sodium thiosulfate 400 mg/kg (1.5 mL/kg) IV over 10 minutes (maximum 12.5 g) for signs of cyanide toxicity

Key Points/Considerations

- Signs of cyanide toxicity include cardiac dysrhythmias, respiratory distress, altered mental status, seizures, and/or hypotension.

Pediatric: ALLERGY and ANAPHYLAXIS

EMT

- ABC and vital signs
- Airway management as indicated and appropriate oxygen therapy
- Follow NYS BLS Anaphylactic Reactions with Respiratory Distress protocol, Hypoperfusion protocol or BLS Nebulized Albuterol protocol.

EMT STOP

AEMT

- In anaphylaxis with signs of shock, administer Normal Saline 20 mL/kg IV or IO bolus.
- Albuterol 2.5 mg in 3 mL (unit dose) via nebulizer. Repeat as necessary up to three (3) doses.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Epinephrine (1:1,000) 0.01 mg/kg IM (max 0.3 mg)
- Diphenhydramine 1 mg/kg IV or IM (maximum dose 50 mg)

CCT AND PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- Methylprednisolone 1 mg/kg IV or IM
- Epinephrine (1:1,000) 0.01 mg/kg IM (maximum 0.5 mg). May repeat q 5 minutes
- Epinephrine (1:10,000) 0.01 mg/kg IV or IO (maximum 0.5 mg)
- Epinephrine (1:1,000) 0.1 mg/kg ET
- Dopamine 10 mcg/kg/min. Titrate upward q 5 minutes by 5 mcg/kg/min

Key Points/Considerations

- If an EMT has administered an Epi Pen, or the patient has administered their own epinephrine, consult Medical Control prior to administering additional epinephrine.
- Consider withholding epinephrine if patient is not displaying signs of severe respiratory distress, facial swelling, or shock (lethargy, poor capillary refill, cyanosis, tachycardia, or hypotension).
- If diphenhydramine given PTA, only administer additional dose to bring total dose to 1 mg/kg (maximum 50 mg).
- Consider Long QT Syndrome prior to administration of Epinephrine.

Pediatric: DIABETIC EMERGENCIES

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Check blood glucose level, if credentialed.
- If blood glucose is known or suspected to be low (less than 60 mg/dl), and patient is able to self-administer and swallow on command, give oral glucose one unit dose (19-24 grams), or available carbohydrate source.
- Call for ALS intercept if unable to swallow on command, or mental status remains altered following administration of oral glucose.

EMT STOP

AEMT

- If blood glucose below 60 mg/dl (40 mg/dl for neonates) and the patient is symptomatic, administer $D_{10}W$, 5 mL/kg (maximum 250 mL) IV. If the patient is not symptomatic, administer oral glucose.
- If patient does not respond to initial treatment, recheck blood glucose and re-bolus with same dose of dextrose if blood glucose <60 mg/dl.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- If blood glucose below 60 mg/dl (40 mg/dl for neonates) and patient is symptomatic, administer D25 2 mL/kg (maximum 100 mL). If patient is asymptomatic, administer oral glucose.
- If patient does not respond to initial treatment, recheck blood glucose and re-bolus with same dose of dextrose if blood glucose less than 60 mg/dl.
- Glucagon 0.5mg IM or IN (if patient < 20 kg) if unable to establish IV
- Glucagon 1 mg IM or IN (if patient ≥ 20 kg) if unable to establish IV
- If blood glucose above 400 mg/dl and signs of dehydration are present, administer normal saline 20mL/kg bolus (10 mL/kg for infants)

AEMT, CC and PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- For Hyperglycemia: Normal saline 20 mL/kg. May get order for repeat dosing

Key Points/Considerations

- Review the Refusal of Evaluation/Stabilization/Transport policy if patient and/or guardian refuse transport after treatment.
- To dilute D50 to a concentration of D25, mix equal volumes of D50 and normal saline.
- Attempt blood draw prior to medication administration to ensure receiving facility has an accurate baseline.
- If a patient on an insulin pump develops symptomatic hypoglycemia, ask the patient or family to turn off or disconnect the insulin pump until blood glucose stabilizes.

Pediatric: HYPOPERFUSION

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- If known adrenal insufficiency (Congenital Adrenal Hyperplasia, Addison's Disease), refer to Adrenal Crisis protocol

EMT STOP

AEMT

CRITICAL CARE

PARAMEDIC

- Normal Saline 20 mL/kg bolus IV or IO (max 1 liter) and reassess.

AEMT, CC and PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- Repeat fluid bolus of 20 mL/kg.
- Dopamine 10 mcg/kg/min. Titrate upward by 5 mcg/kg/min q 5 minutes to 20 mcg/kg/min.

Key Points/Considerations

- For patients with hypoperfusion due to trauma, bleeding, vomiting, diarrhea or sepsis
- Inadequate perfusion is manifested by depressed level of consciousness, capillary refill time > 2 seconds, cool, clammy or mottled skin, cyanosis, tachycardia, systolic BP less than 70 mmHg (2 years and older) or systolic BP less than 60 mmHg (less than 2 years old).
- For neonates or patients with suspected congenital heart disease, administer 10 mL/kg boluses instead of 20 mL/kg and continually reassess lung sounds for signs of CHF.
- When administering a fluid bolus to a pediatric patient, use a volume control device to accurately measure fluid volume.

Pediatric: SEIZURES

EMT

AEMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Check blood glucose level, if credentialed. If level is abnormal refer to Pediatric Diabetic protocol.

EMT and AEMT STOP

CRITICAL CARE

PARAMEDIC

- Administer **one** of the following benzodiazepines:
  - Midazolam (Versed)
    - 0.1 mg/kg (max 2.5 mg) IV/IO **OR**
    - 0.2 mg/kg (max 5 mg) IM/IN **OR**
    - 0.4 mg/kg (max 10 mg) PR (remove needle first) **OR**
  - Diazepam (Valium)
    - 0.1 mg/kg (max 5 mg) IV/IO/IM **OR**
    - 0.5mg/kg (max 10 mg) PR (remove needle first) **OR**
  - Lorazepam (Ativan)
    - 0.1 mg/kg (max 2 mg) IV/IO/IM **OR**
    - 0.2 mg/kg (max 4 mg) PR (remove needle first)

CC and PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- Additional
  - Midazolam (Versed) 0.1 mg/kg IV, IM, or IN **OR**
  - Diazepam (Valium) 0.1 mg/kg IV or IM **OR**
  - Lorazepam (Ativan) 0.1 mg/kg IV or IM

Key Points/Considerations

- Protect the patient and EMS crew from injury during the seizure.
- Advanced EMS providers may assist the patient's family or caregivers with administration of rectal Valium (Diastat) if available.

Pediatric: OVERDOSE or TOXIC EXPOSURE

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Determine what was taken, when and how much, if possible.
- **Check blood glucose level**, if credentialed. If level is abnormal refer to Pediatric Diabetic protocol.
- For symptomatic patients with suspected Opiate overdose:
  - Naloxone 1 mg IN (0.5mg/ml injected with MAD in each nostril)

EMT STOP

AEMT

CRITICAL CARE

PARAMEDIC

- For symptomatic opiate overdose: Naloxone (Narcan) 0.4 mg IV, IM, or IN. May repeat prn up to 2 mg total dose.
- Follow hypoperfusion protocol.

AEMT, CC and PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- For symptomatic patient with:

  Organophosphate poisoning: Atropine 1 mg IV per dose every 3 – 5 minutes, until secretions dry

  Dystonic reaction: Diphenhydramine (Benadryl) 1 mg/kg IV or IM (max 25 mg)

  Beta blocker OD: Glucagon 1 mg IV

  Administer a benzodiazepine for agitation:
  - Midazolam (Versed) 0.1 mg/kg (max 2.5 mg) IV/IO, or 0.2 mg/kg (max 5 mg) IM/IN **OR**
  - Diazepam (Valium) 0.1 mg/kg IV, IO or IM (max 5 mg) **OR**
  - Lorazepam (Ativan) 0.1 mg/kg IV, IO or IM (max 2 mg)

  Calcium channel blocker OD: Calcium Chloride 20 mg/kg IV and Glucagon 1 mg IV

  Tricyclic antidepressant OD: Sodium bicarbonate 1mEq/kg IV

Key Points/Considerations

- Includes patients who are unconscious/unresponsive without suspected trauma or other causes, and patients with a brief loss of consciousness.
- Dystonic reaction is uncontrolled contractions of face, neck or tongue.
- Do not contact Poison Control Center for medical direction.
- Gather and transport pills or other suspected substances in their containers.

Pediatric: ADRENAL CRISIS

EMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy

EMT STOP

AEMT

- IV access and bloods drawn
- Normal Saline 20 mL/kg bolus IV or IO (1 L max)

AEMT STOP

CRITICAL CARE

PARAMEDIC

- Hydrocortisone 2 mg/kg IV or IO (100 mg max dose) if available; **OR**
- Methylprednisolone 2 mg/kg IV, IM or IO (125 mg max dose) **OR**
- Administer the prescribed dose of either Hydrocortisone or Methylprednisolone directed by the patient's health care provider and indicated on the laminated card carried by the patient ***if dated within the preceding year***.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Repeat fluid bolus of 20 mL/kg (1 L max).
- Confirm medical history prior to steroid administration.

Key Points/Considerations

- Adrenal crisis: inability to cope with shock due to lack of appropriate cortisol production
- Adrenal crisis can occur from stress from medical or trauma etiologies.
- Adrenal crisis can present in the following conditions: Congenital Adrenal Hypo/Hyperplasia, Addison's Disease, Adrenal tumors.
- Patients will be on replacement medications (Hydrocortisone, Fluticortisone, Methylprednisolone) on a daily basis.
- Rapid steroid administration in patients with these conditions can be lifesaving.
- Hydrocortisone is the preferred medication.
- Parents and patients are often well versed in their condition, and input from the patient/parent may be very valuable.
- Patient/parent may have dose of Hydrocortisone on site. CCT/Paramedic may help administer patient's own steroid medication based on protocol.
- This protocol should NOT be used unless patient is CONFIRMED to have one of the above conditions by patient/parent or medic alert bracelet/necklace/card.
- There is little risk in steroid administration to these patients, but if any question, contact Medical Control.
- Check blood glucose levels frequently as blood glucose tends to fall rapidly.

Pediatric: PAIN / NAUSEA / SEDATION

EMT

AEMT

- ABC and vital signs
- Airway management and appropriate oxygen therapy
- Apply ice, elevation and immobilization of injured limb or area.

EMT and AEMT STOP

CRITICAL CARE

PARAMEDIC

- Nausea/Vomiting: Ondansetron (Zofran) 0.1 mg/kg (maximum 4 mg) IV or IM. May repeat once in 10 minutes for persistent nausea.
- Pain: Morphine 0.1 mg/kg IV or IM up to 5mg. May repeat once in 5 minutes prn.
- Sedation for painful procedures only (**not for restraint**):
  - Midazolam (Versed) 0.1 mg/kg (max 2.5 mg) IV/IO, or 0.2 mg/kg (max 5 mg) IM/IN **OR**
  - Diazepam (Valium) 0.1 mg/kg IV, IO or IM (max 5 mg) **OR**
  - Lorazepam (Ativan) 0.1 mg/kg IV, IO or IM (max 2 mg)
- Diphenhydramine 1 mg/kg (maximum 50 mg) IV or IM prn for itching

CCT AND PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- Morphine 0.1 – 0.1 mg/kg IV
- Fentanyl 0.5-1 mcg/kg IV or IM

Key Points/Considerations

- Withhold opiate analgesia and benzodiazepine if patient is hypotensive.
- If administered rapidly and in very large doses, fentanyl can cause muscle spasm and chest wall rigidity. The only reliable treatment for this is neuromuscular blockade.

Pediatric: NEONATAL RESUSCITATION

EMT

- Provide warmth and dry
- Clear airway if necessary
- Routinely evaluate
- If not term gestation, not breathing or crying, or has poor tone, then stimulate the neonate
- If HR <100, gasping, or apnea:
  - Clear airway (if necessary)
  - Ventilate with neonatal BVM at 30-60 breaths/minute with supplemental oxygen. If neonatal BVM not available, use only the volume required to make the chest rise. DO NOT OVERINFLATE.
  - Monitor SpO_2.
- If HR < 60, begin CPR.

EMT STOP

AEMT

- Consider Intubation:
  - For initial endotracheal suctioning of ***non-vigorous meconium stained*** newborns
  - If bag-mask ventilation is ineffective or prolonged
  - When chest compressions are performed
  - For special resuscitation circumstances, such as congenital diaphragmatic hernia or extremely low birth weight
- IV/IO access

AEMT STOP

CRITICAL CARE

PARAMEDIC

- IV/IO Epinephrine 0.01 - 0.03 mg/kg of 1:10,000 concentration (0.1 -0.3 mL/kg)
- If IV access is not available, administer Epinephrine 0.05 - 0.1 mg/kg of 1:10,000 concentration (0.5 – 1 mL/kg) via ET.

CC and PARAMEDIC STOP

MEDICAL CONTROL TREATMENT OPTIONS

- Normal Saline 10 mL/kg over 5 minutes
- Termination of resuscitation

Key Points/Considerations

- Drugs are rarely indicated during the resuscitation of the newly born infant. Bradycardia is usually due to inadequate lung inflation or profound hypoxemia. Adequate ventilation is most important.
- If Epinephrine is administered, the 1:10,000 concentration is used for both IV and ET routes.
- It is normal to see low SpO_2 levels after birth. Targeted pre-ductal SpO_2 after birth should be:

1 min	60% - 65%
2 min	65% - 70%
3 min	70% - 75%
4 min	75% - 80%
5 min	80% - 85%
10 min	85% - 95%

Operations: Inter-Hospital Transport

EMT

- All levels of care may follow relevant non-interfacility protocols as needed
- An EMT may transport stable patients with a secured saline lock device in place, as long as no fluids or medications are attached.

EMT STOP

AEMT

- An AEMT may transport stable patients with simple IV fluids such as D5W, Normal Saline or Lactated Ringers. The solution may not contain potassium or any medications.

AEMT STOP

CRITICAL CARE

- Paramedics and Critical Care Technicians may transport a patient between hospitals with standard IV infusions flowing, provided they are ordered by the transferring physician.
- Be certain to clarify orders regarding medication titration prior to departure. Any medication in the WREMAC protocol formulary is permissible for transport.
- All medications must be run on an infusion pump
- **AMIODARONE (CORDARONE)**
  - Usual Dose: 1 mg/min infusion for first 6 hours, then 0.5 mg/min infusion
  - Discontinue if hypotension or symptomatic bradycardia occurs. Consult ED physician.
- **ANTIBIOTICS**
  - Discontinue if signs of allergic reaction
- **DILTIAZEM (CARDIZEM)**
  - Discontinue if hypotension or symptomatic bradycardia occurs. Consult ED physician.
- **GP IIb/IIIa RECEPTOR INHIBITORS or other ANTICOAGULANT AGENTS**
  - Monitor patient for signs of bleeding around IV sites, hemoptysis, hematuria, or epistaxis
  - Discontinue if any signs or symptoms of bleeding complications
- **HEPARIN**
  - Monitor patient for signs of bleeding around IV sites, hemoptysis, hematuria, or epistaxis
  - Discontinue if any signs or symptoms of bleeding complications
- **NITROGLYCERIN**
  - Monitor blood pressure every 5 minutes
  - Discontinue if systolic blood pressure falls below 90 mm Hg, or if diminishing mental status occurs with diminishing blood pressure
  - Maximum dose 20mcg/min
- **CCTs who have complete additional training, completed the WREMAC inter-facility test, and been approved by their medical director may:**
  - Utilize/monitor ventilators, chest tubes, central lines
  - Administer additional medications/perform additional interventions found in the WREMAC Inter-facility Transport Protocols (up to 3 drips)

CC STOP

Protocol continues on next page...

PARAMEDIC

- **Paramedics who have complete additional training, completed the WREMAC Inter-facility test, and been approved by their medical director may:**
  - Utilize/monitor ventilators, isolettes, chest tubes, central lines
  - Administer additional medications/perform additional interventions based on the WREMAC Inter-facility Transport Protocol and/or agency protocols.

PARAMEDIC STOP

Key Points/Considerations

- If there are any changes in the patient's condition that are not covered by the prescribed orders or agency protocols, contact Medical Control Physician. If a total failure of communications occurs and the patient is unstable and decompensating, follow these protocols and go to the closest hospital emergency department.
- Patients who require cardiac monitoring for inter-hospital transport should be transported by an EMT-CC or paramedic.
- Agency medical directors may limit what additional medications/interventions their providers are able to utilize with additional training. Medications listed in the standard protocols or this protocol may be given without additional training only by same route/manner (example: Morphine IV push). Additional training/testing/approval is required if that medication is administered in a different route/manner (example: Morphine IV Drip/Continuous infusion).
- If there are any changes in the patient's condition that are not covered by the prescribed orders or agency protocols, contact Medical Control Physician. If a total failure of communications occurs and the patient is unstable and decompensating, follow these protocols and go to the closest hospital emergency department.
- Agencies must create policies for medical control consultation and physician orders.
- Additional medications must provide the medication as ordered and provided by the transferring physician or facility.
- NYS DOH Regulation: Policy 15-06 (or superseding) for Transporting Patients with Blood/Blood Products - BLOOD TRANSFUSIONS OR BLOOD PRODUCTS MAY NOT BE INITIATED OR TRANSPORTED WITHOUT A NURSE PRESENT UNLESS APPROVAL AS AMBULANCE TRANSFUSION SERVICES (ATS) EXISTS.
- This protocols supersedes the separately published "WREMAC Interfacility Transport Protocols"

Operational: INCIDENT SCENE REHABILITATION

Establishing Rehab

- Establish rehab for incidents which are large, of long duration, labor intensive, or in extreme environmental conditions, including heat stress index >90 F or wind chill <10 F (see attached charts).
- Locate rehab out of extremes of temperature and weather (ie- shaded, sheltered area), and out of view of the scene.
- Rehab to consist of a rehab and a medical sector. Staff rehab ideally with 1 EMT per 5 firefighters in rehab; staff medical sector with a dedicated ALS ambulance and crew for transport from scene.

Frequency and Duration of Rehab

- Working with a SCBA
  - Ideally after 30 minutes- at least 10 minutes of rest in rehab
  - At minimum after 45-60 minutes- at least 20 minutes of rest in rehab
- Physical exertion without a SCBA
  - Ideally after 20 minutes of physical exertion- at least 10 minutes of rest in rehab
  - At minimum after 40 minutes of physical exertion- at least 20 minutes of rest in rehab

Rehab Protocol

- Firefighters should remove PPE on arrival to aid passive cooling.
- Medical assessment on arrival to rehab
  - Mental status: if abnormal (alterations in mental status, speech, or behavior), send to medical sector for evaluation.
  - Review of systems: ask about chest pain, shortness of breath, dizziness, headache, nausea, or vomiting. If any positive, send to medical sector for evaluation.
- Rest for at least time described above.
- Rehydration can include cool water and sports drinks as desired, or warm broth in cold weather. Energy bars should be available for nutrition. Avoid caffeinated or carbonated drinks.
- In hot weather, have towels soaked in ice water available for active cooling. Sanitize in bleach solution (1/4 cup bleach per gallon water) then rinse in plain water between each use.
- Repeat medical assessment after rest period, before return to work.
  - Repeat mental status assessment and review of systems. If abnormal send to medical sector for evaluation.
  - Measure pulse by palpation for 30 seconds.
    - Pulse < 110 and mental status/ review of systems normal - may return to work.
    - Pulse > 110
      - Rest for additional 10 minutes and check a full set of vital signs including pulse, blood pressure, and oral temperature. If abnormal, repeat 10 minutes of rest followed by full set of vital signs, up to 3 times total (30 min additional rest).
      - Pulse should be <110, blood pressure <160/100, and temperature <100.6.
      - If all vital signs are below these limits at any time on repeat, may return to work after a repeat check of mental status and review of systems.
      - If pulse, temperature, or blood pressure are still above these limits after third check (30 minutes additional rest), send to medical sector for evaluation.

Operational: INCIDENT SCENE REHABILITATION (cont'd)

Heat Index Chart - National Weather Service

Temperature, °F	Relative Humidity, %																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	85	87	88	89	91
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
105	95	97	100	102	105	109	113	118	123	129	135	142	149								
110	99	102	105	106	112	117	123	130	137	143	150										
115	103	107	111	115	120	127	135	143	151												
120	107	111	116	123	130	139	148														
125	111	116	123	131	141																
130	117	122	131																		
135	120	128																			
140	125																				

U.S. Customary Wind Chill Chart

Estimated Wind Speed in MPH	Actual Thermometer Reading (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect)	LITTLE DANGER* (for properly clothed person)				INCREASED DANGER* (for properly clothed person)			GREAT DANGER*				
	*DANGER FROM FREEZING OF EXPOSED FLESH											

Operational: TRANSFER OF CARE PROTOCOL

EMT

- EMTs may not transfer care to a CFR for transport.

AEMT

CRITICAL CARE

PARAMEDIC

- Calls may be handed down from a higher level of care to an EMT or AEMT provided ***none*** of the following contraindications exist.
    - Hot (Lights and Sirens) transport to the hospital is anticipated
    - Cardiac Arrest/Respiratory Arrest (currently or status post)
    - Unstable Patients
    - Altered Mental Status
    - Chest Pain with potential to be Cardiac Related
    - Difficulty Breathing, Abnormal Breathing or Intubated
    - Hypotension
    - Tachycardia or Bradycardia
    - Patient has received an IV medication (other than NS).
    - The need (or potential need) for higher level of care intervention and/or monitoring during transport
- A paramedic may hand a call down to an EMT-CC, unless a treatment or skill is required/may be required that is outside the EMT-CC scope of practice. (ie. differences in standing orders/protocols).

PHYSICIAN OPTIONS

- Transfer care to lower level of provider after online medical consultation.

Key Points/Considerations

- The highest level of care must perform and document an assessment by an ALS provider for all patients before handing care down to a lower level of care.
- The patient must be transported by the provider with the highest level of certification, if there exists any question(s) regarding the safety and/or effectiveness of the transfer. If there are any questions, the crew shall contact medical control.
- For all transfers, the lower level of care must be comfortable and agree to accept care of the patient from the higher level of care.
- This policy does not apply to multi-casualty incidents in which it is customary and necessary practice for EMS providers to field-triage patients to care and transportation by EMS providers of lower level of certification.
- Agencies must have a system to review ***all*** calls transferred to lower levels of care.

Operational: ADULT NERVE AGENT EXPOSURE

EMT

AEMT

- NOTE: UNLESS YOU ARE WEARING APPROPRIATE PROTECTIVE EQUIPMENT, DO NOT COME INTO CONTACT WITH THE PATIENT! YOU WILL BECOME THE NEXT VICTIM!
- **Insure patient is decontaminated**
- ABC and vital signs, supporting respirations and suctioning airway as appropriate
- Evaluate for other injuries. If fall occurred, refer to Selective Spinal Immobilization protocol.
- Once decontaminated, transport to Emergency Department directed by Transportation Officer.
- May use atropen as directed below IF CREDENTIALLED.

EMT and AEMT STOP

CRITICAL CARE

PARAMEDIC

- If signs of SEVERE exposure (see below), administer 3 MARK-I kits **or** 3 AtroPens IM
  - Respiratory distress or apnea
  - Seizure
  - Loss of consciousness
  - Paralysis
- If signs of MODERATE exposure (see below), administer 2 MARK-I kits **or** 2 AtroPens IM
  - Respiratory distress or productive cough
  - Nausea / vomiting
  - Muscle fatigue / twitching
  - Staggering
- If signs of MILD exposure (see below), administer 1 MARK-I kit **or** 1 AtroPen IM
  - Constricted pupils
  - Runny nose
  - Mild wheezing / cough
- If patient is actively seizing, administer CANA kit or follow seizure protocol
- Advanced Airway as needed
- Atropine 1mg IV, IO, or IM every 3 minutes (max 20 mg) for persistent symptoms until endpoint reached:
  - Drying of secretions
  - Resolution of bronchospasm

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional atropine
- Additional benzodiazepine

Key Points/Considerations

- Each MARK-I kit contains Atropine 2mg, and 2-PAM 600 mg.
- May use equivalent dose of NAAK, Atropine, or Atropen if MARK-I kit not available

Operational: PEDIATRIC NERVE AGENT EXPOSURE

EMT

AEMT

- NOTE: UNLESS YOU ARE WEARING APPROPRIATE PROTECTIVE EQUIPMENT, DO NOT COME INTO CONTACT WITH THE PATIENT! YOU WILL BECOME THE NEXT VICTIM!
- **Insure patient is decontaminated**
- ABC and vital signs, supporting respirations and suctioning airway as appropriate
- Evaluate for other injuries. If fall occurred, refer to Selective Spinal Immobilization protocol.
- Once decontaminated, transport to Emergency Department directed by Transportation Officer.
- May use Atropen as directed below IF CREDENTIALLED.

EMT and AEMT STOP

CRITICAL CARE

PARAMEDIC

- CHILDREN OVER 40KG or 10 YEARS OLD – FOLLOW ADULT PROTOCOL
- FOR CHILDREN LESS THAN 40 KG AND LESS THAN 10 YEARS OLD:
- If signs of SEVERE exposure (see below), administer 3 weight appropriate AtroPens IM
  - Respiratory distress or apnea
  - Seizure
  - Severe muscle twitching or general weakness
  - Loss of consciousness or confusion
  - Incontinence
  - Paralysis
- If signs of MILD / MODERATE exposure (see below), administer 1 weight appropriate AtroPen IM
  - Respiratory distress or productive cough
  - Nausea / vomiting / stomach cramps
  - Muscle fatigue / tremors
  - Excessive drooling
  - MILD symptoms: constricted pupils, runny nose, mild wheezing / cough.
- If patient is actively seizing follow seizure protocol.
- Advanced Airway as needed
- Atropine dose repeated every 3 minutes for persistent symptoms until endpoint reached:
  - Drying of secretions
  - Resolution of bronchospasm

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional atropine
- Additional benzodiazepine

Key Points/Considerations

Weight appropriate AtroPens:
- Infants < 7 kg: Yellow (0.25 mg)
- 7 – 18 kg: Blue (0.5 mg)
- 18 – 40 kg: Dark Red (1 mg)
- Over 41 kg: Green (2 mg)

Operational: SUSPECTED CARBON MONOXIDE EXPOSURE

ALL LEVELS OF CARE

- Any patient with suspected carbon monoxide poisoning should receive oxygen via NRB mask.
- Noninvasive measurement of the patient's carboxyhemoglobin may be used to guide therapy.
- Follow appropriate protocols as needed.
- **ASYMPTOMATIC** potentially exposed people:
  - If there is a CO alarm in a residence, an FDA approved noninvasive device may be used to test carboxyhemoglobin levels on the occupants of the location.
  - Any asymptomatic patient with a level of greater than 12% should receive oxygen for 30 minutes, then reassess the patient.

- **SYMPTOMATIC** patients:
  - If there is a CO alarm in a residence, an FDA approved noninvasive device may be used to test carboxyhemoglobin levels on the ill occupants of the location.
  - Carbon monoxide poisoning does not have specific, clear cut symptoms, and other medical conditions may present with dizziness, nausea or confusion.
  - Consider transport of all symptomatic patients, regardless of CO level.

- **MULTIPLE** patients:
  - Consult Medical Control for guidance regarding transport location decisions and on-scene treatment and release when multiple patients are involved.
  - If there is potential for greater than 5 symptomatic patients, consider requesting a physician to the scene.

PHYSICIAN OPTION

- CONSIDER direct transport to a hyperbaric center if patient's SpCO reading is:
  - > 25% in the adult patient.
  - > 15% in the pediatric patient
  - > 15% in the pregnant patient.
  - AND/OR the patient is unconscious, has significant altered mental status, or the patient is pregnant.

Key Points/Considerations

- Pediatrics – Some devices are not intended for use on patients weighing <30 kg; refer to manufacturer's specifications.
- Pregnant Women – The fetal SpCO may be 10-15% higher than the maternal reading.
- Smokers – Heavy smokers may have baseline SpCO levels up to 10%.
- A misapplied or dislodged sensor may cause inaccurate readings.
- Never use tape to secure the sensor.
- Do not place the sensor on the thumb or 5th digit.
- Hospitals with hyperbaric chambers that can be used emergently for CO poisoning are listed on the WREMAC web site

Operational: VENTRICULAR ASSIST DEVICES

EMT

- Follow appropriate protocol based on complaint.
- Assess pump function and circulation:
  - Listen to motor of pump over heart and observe green light on system control device.
  - Assess perfusion based on mental status, capillary refill, and skin color. The absence of a palpable pulse is normal for patients with a functioning VAD. They may not have a blood pressure. **DO NOT PERFORM CPR.**
- **Notify facility that placed device ASAP**, regardless of the patient's complaint.
  - For **URMC Heart Failure Coordinator, c**all 1-800-892-4964 and declare a "VAD EMERGENCY".
- Bring patient's power unit and batteries to the Emergency Department.
- Unless otherwise directed by Medical Control, transport patient directly to facility that placed and manages device.
- Do not delay transport to hospital.

EMT STOP

AEMT

- If hypotensive (defined as poor perfusion based on mental status, capillary refill, or skin color):
  - Establish IV/IO access and administer 500mL NS bolus.
- Reassess and repeat up to 1000mL total. Contact Medical Control for additional fluid boluses.

AEMT STOP

CRITICAL CARE

PARAMEDIC

- If patient does not have evidence of adequate perfusion and oxygenation with treatment, despite the device being on, treat with standard ACLS measures.

CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Consider contacting device facility directly and discuss destination decision.

Key Points/Considerations

- Community patients are entirely mobile and independent.
- Keep device and components dry.
- Batteries and the emergency power pack can provide 24-36 hours of power.
- Trained support members include family and caregivers who have extensive knowledge of the device, its function, and its battery units and are a resource to the EMS provider when caring for a VAD patient.
- Patients are frequently on three different anticoagulants and are prone to bleeding complications
- Patient may have VF/VT and be asymptomatic. Contact Medical Control for treatment instructions.

Operational: TASER BARB REMOVAL

EMT

AEMT

CRITICAL CARE

PARAMEDIC

- Must be credentialed by service medical director to remove TASER barbs
- After ensuring that the electrical current is disconnected, cut the wires at the base of the probe that is attached to the skin
- **CONTRAINDICATIONS TO REMOVAL:** Dart penetrated the eye, face, neck, breasts (females), axilla or genitals
- Wearing gloves, grasp the cylinder of the TASER dart between the thumb and index finger of one hand. Remove the dart with a quick, firm pull directed perpendicular to the skin surface. Dispose of the dart in a sharps container, being careful not to poke oneself with the barb. Repeat this step for each embedded dart
- Clean the wound with gauze with water or saline if required and apply a bandage to each site.

EMT, AEMT, CC and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Perform a 12-lead EKG

Key Points/Considerations

- If after successful removal of the TASER barbs, the patient may refuse medical treatment and/or transportation if the following criteria are met:
  - Patient must have a GCS of 15
  - Patient must have a heart rate of <110 bpm, respiratory rate >12, O2 saturation >94%, systolic blood pressure >100mmHg and <180mmHg
  - Patient has no other acute medical or psychiatric condition requiring medical evaluation, such as: Traumatic injury sustained in TASER induced fall or police encounter, Hypoglycemia, Acute psychiatric disturbance or Agitated/Excited delirium syndrome
  - No tetanic muscle contractions
  - Patient is 18 years of age or older
  - Patient has had tetanus booster in last ten years. If tetanus status is unknown, the patient may be taken to hospital by police if all other treat and release criteria are met. (Police are to be informed that it is the responsibility of the police service to ensure that the patient receives a tetanus booster within 72 hours. This advice must be documented of the PCR.
  - All darts which have been deployed are accounted for
- Refer to *WREMAC PROTOCOL: REFUSAL OF TREATMENT/TRANSPORTATION POLICY* for other considerations regarding treat and release

Tactical Emergency Medical Section

"The fate of the wounded rests in the hands of the one that applies the first dressing...."
- Nicholas Senn, MD 1897

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Niagara County Sheriff – ERT

Jason Tolsma, EMT-P/T
Tactical Medic
Cheektowaga Police – SWAT

Justin Ward, EMT-P/T
Tactical Medic
LVAC/Lancaster Police – SWAT

Subject: Tactical Emergency Medical Support for Law Enforcement Team

I. PURPOSE

Law enforcement agencies (LEA) have a variety of responsibilities to protect and serve. Some of the most austere and unconventional of those scenarios require the need of specialized weapons and tactics (SWAT). Most teams are equipped and highly trained to handle situations including, but not limited to, hostage incidents, barricaded subjects, high risk warrant service, and VIP or dignitary protection. All are highly trained to operate in these adverse conditions, which are potentially unpredictable and dangerous scenarios that might preclude an ordinary EMS response. Due to the nature of the missions and training, the development of a medical component and integration of EMS team members is important to overall team wellbeing and safety. These protocols serve all levels of New York State EMS certification. They are intended to be a guideline to medical intervention and cannot replace sound judgment and situational awareness. Providers are also cautioned not to rely on these protocols as a sole source of information about patient care, but rather to tailor their therapy to the clinical context. It is highly encouraged that any EMS provider who will function as a tactical medical provider (TMP) seek formal training in tactical medicine.

II. JUSTIFICATION

Emergency Medical Service (EMS) providers assigned to law enforcement tactical teams (SWAT, ERT, SRT, SORT, etc.) potentially operate under dangerous conditions with unconventional hazards. Conventional Emergency Medical Services, while possessing the medical knowledge in accordance with NYS curriculum, are not equip or trained to operate within a tactical environment. The purpose of tactical emergency medicine support is to provide preventative medicine with immediate access to medical care, despite the hazardous environment that may exist. EMS providers operating through bona fide TEMS programs are required to provide care within the scope of a NYS EMS provider for which they are certified to perform. With the exception of the tactical specific protocols outlined in this document, standing orders for medical practice will be followed as outline by the Western Regional Emergency Medical Advisory Committee (WREMAC).

III. DEFINITION OF TACTICAL ENVIRONMENT THE TACTICAL ENVIRONMENT

a) Any law enforcement operation where deployed personnel are in a large-scale operation or where the risk of injury is sufficiently high as to warrant the presence of on-scene emergency medical services providers.
b) Types of operations may include: high-risk warrant service, hostage-barricade situations, emergency ordinance disposal, executive protection details, civil demonstration or protest, dynamic training operations, aquatic operations, high-angle, search and rescue missions, and acts of terrorism.
c) Any prolonged law enforcement deployment, where performance decrement or environmental issues may arise and the safety of the public and deployed law enforcement personnel would benefit from the presence of a Tactical EMS Provider to monitor these circumstances.

IV. RATIONALE

a) The committee on Tactical Emergency Casualty Care (C-TECC) provides definitions and treatment recommendations on injuries commonly encountered in the non-military tactical environment. This protocol was designed with educational standards from each of the above authorities and will include situational specific deployment of skills to specifically address the three most common potentially preventable causes of combat death:
    1. Exsanguination
    2. Tension pneumothorax
    3. Airway obstruction
b) Adapted from TCCC, the C-TECC organization defines medical care with focus on the operational environment and team movement as coordinated by the tactical commander or as outlined by departmental Standard Operation Procedures (SOP'S). The rationale of providing medical treatment for injuries during tactical operations will be based on three phases of medical care as outline by C-TECC.
    1. Direct Threat Care
    2. Indirect Threat Care
    3. Tactical Evacuation Care includes Casualty Evacuation (CASEVAC) and Medical Evacuation (MEDEVAC)

V. ROLES, RESPONSIBILITIES AND SCOPE OF THE TACTICAL MEDICAL PROVIDER (TMP)

a) The Tactical Medical Provider (TMP) will provide rapid assessment and scene survey in order to deploy potentially lifesaving treatment for tactical operators, other law enforcement agents and civilians injured during tactical operations.
b) The TMP should be able to distinguish, through specialty training and operational experience, the specifics of the law enforcement perimeters. In addition to zone awareness, the specifics of medical intervention should be chosen based of operational availability and safety. If life-threatening injuries are identified during the initial patient assessment, lifesaving treatments can be initiated immediately if tactically feasible.
c) The TMP should act as a liaison to conventional EMS and as an advocate for the patient during transition of care and/or delivery to definitive care.
d) The tactical medical provider is not directly responsible for the care of any person(s) outside the law enforcement operational area whose care can be safely rendered by local EMS operations.
e) Only tactical EMS providers sponsored by a law enforcement agency and operating under law enforcement command shall use the Tactical Emergency Medical Services Protocols.
f) Once a patient has been removed from the law enforcement perimeter or when considered safe by the tactical commander, the general WREMAC protocol should be followed.
g) Operational command within a law enforcement perimeter of operation lies with the law enforcement commander. At times, the safety and success of the law enforcement objectives may override the need to care for casualties. The law enforcement commander is responsible for the care and movement of casualties within a law enforcement operation.

VI. CONSIDERATIONS FOR MEDICAL DIRECTORS

a) It is strongly recommended that those EMS providers wishing to become Tactical Medical Providers (TMPs) should, in addition to their NYS DOH Emergency Medical Technician certificates, have formal training in the principles tactical medicine as well as current certifications in PHTLS or ITLS.
b) Service medical directors overseeing tactical medical programs should strongly consider obtaining physician specific, tactical medical training. This training should focus to provide insight into tactical medical training and the unique needs of those providers seeking medical direction for law enforcement medical teams.
c) In addition to advanced medical training, a TMP should consistently train with law enforcement agencies they intend to provide care for in order to familiarize themselves and gain perspective on special tactics, team specific needs, police security, sensitive information and overall law enforcement safety.
d) Non-law enforcement providers may have additional training recommendations specific to the team they support based on their needs, tactics, weapons, etc.
e) It is not intended that memorization of this protocol will qualify an EMS provider as a tactical medical provider. The WREMAC TEMS protocol makes the assumption that the individual provider is familiar with TEMS and the C-TECC/TCCC model of care.
f) The recommendations on specific courses and qualifications above are intentionally vague. Prior to being credentialed to use these protocols we recommend discussion on acceptable training between the EMS provider looking to engage, train and ultimately provide medical care to a law enforcement agency and their service medical director.

END SECTION

Direct Threat Care

TEMS: LIFE-THREATENING BLEEDING

EMT

AEMT

CRITICAL CARE

PARAMEDIC

- Identify major hemorrhage
- Direct casualty to apply direct pressure if able and move to cover when possible
- Stop Life-threatening external hemorrhage if tactically feasible
    - Use a C-TECC recommended tourniquet for hemorrhage that is anatomically amendable to tourniquet placement (ie. Extremity wound)
    - Apply the tourniquet proximal to the bleeding site, over the uniform, tighten until bleeding stops and distal pulses are not palpable.
    - Move the casualty to collection point.

EMT, AEMT, CCT, PARAMEDIC STOP

PHYSICIAN OPTIONS

- Terminate efforts for injuries involving obvious death criteria

Key Points/Considerations

- Direct Threat Care is the care rendered by the Tactical Medical Provider (TMP) while the TMP and the patient are still within an effective hostile environment
- Expedite to indirect threat environment- If placing a tourniquet will take longer to accomplish than removing the patient from the line of fire, evacuation either by self or assisted is preferred.
- Attempt to keep all protective gear in place to minimize casualty's exposure
- All personnel on tactical missions should have a TCCC recommended tourniquet readily available in a standard location and be trained on its use
- Cervical spinal immobilization is best left for tactical field care stage. There is no need to immobilize the cervical spine with only penetrating trauma to the extremities or trunk. Consider cervical immobilization for penetrating neck trauma. When feasible and for blunt trauma, see *WREMAC PROTOCOL: TRAUMA – INJURY*.

INDIRECT THREAT CARE

TEMS: AIRWAY AND BREATHING MANAGEMENT

EMT

- Chin lift or jaw thrust maneuver
- Nasopharyngeal airway insertion
- Attempt to clear any obstruction – suctioning if available
- Administer oxygen or assist with ventilations if required
- If sucking chest wound, cover with occlusive dressing. If dyspnea increases, release the dressing momentarily during exhalation.
- Call for ALS backup

EMT STOP

AEMT

- If no gag reflex, place FDA approved supraglottic airway device
- For penetrating chest trauma, use totally occlusive dressing - make sure to check for exit wounds
- Needle thoracostomy (decompression) with signs of tension pneumothorax

AEMT STOP

CRITICAL CARE

PARAMEDIC

- If indicated and a less invasive airway is not possible - Perform a needle or percutaneous cricothyrotomy with FDA approved device (if credentialed as per WREMAC PROTOCOL)

PARAMEDIC STOP

PHYSICIAN OPTIONS

- Attempt to secure airway with endotracheal intubation
- Medication facilitated intubation for credentialed providers – SEE WREMAC MEDICAL PROTCOL: MEDICATION FACILITATED INTUBATION

Key Points/Considerations

- Indirect threat care may easily revert to direct threat care during an operation– situational awareness is essential
- If the casualty is conscious, allow them to assume any position that facilitates protecting their airway
- In general, endotracheal intubation is best left to Indirect Threat Care phase.
- Signs and symptoms of a Tension Pneumothorax: absent lung sounds on one side, extreme dyspnea, jugular vein distention (JVD), cyanosis or hypoxia (even with high flow oxygen), tracheal deviation AND hypotension – reevaluate frequently
- Decompression needle should be a minimum of 14 gauge, 3.25” catheter

TEMS: BLEEDING MANAGEMENT

EMT

- Assess for unrecognized bleeding and control all sources
- Hemostatic agents/gauze may be used to control hemorrhage occurring in sites not amenable to tourniquet placement and which cannot be controlled by direct pressure alone
- Packing of larger wounds may be necessary for bleeding control and can be accomplished with sterile gauze, rolled gauze or hemostatic agents/gauze.
    - DO NOT place hemostatic agents into open abdominal or chest wounds
- Reassess prior tourniquet application – determine if it is needed. If the tourniquet is still indicated and over the clothing, apply another tourniquet directly to the skin 2-3 inches above the wound. MARK TIME OF PLACEMENT.
    - Only release the first tourniquet after the replacement tourniquet is in place and functioning
- Minimize exposure to the elements – cover patient to prevent hypothermia

EMT STOP

AEMT

CRITICAL CARE

PARAMEDIC

- Start intravenous or IO access
- Administer Normal Saline in 250 ml boluses to a goal of a systolic pressure >90 mmHg or return to normal mental status.

AEMT, CCT and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional saline boluses

Key Points/Considerations

- CPR for victims of blast or penetrating trauma who have no pulse, no ventilations and no other signs of life will not be successful and should not be performed
- For pain and sedation see *WREMAC PROTOCOL: ADULT PAIN / NAUSEA / SEDATION*
- For Burns see *WREMAC PROTOCOL - TRAUMA: BURN MANAGEMENT*

Tactical Evacuation Care

TACTICAL EVACUATION CARE – GENERAL CONSIDERATIONS

Key Points/Considerations

- Refer to Tactical Field Care for initial management.
- This stage is intended to start treatment not rendered during Phase Two and to be a continuation of those skills performed. In particular reassessment of ABC's, interventions performed and performance of medical and trauma considerations from the *MEDICAL and TRAUMA WREMAC PROTOCOL* sections.
- It is appropriate to consider fracture, dislocation and spinal immobilization prior to transport in this phase.
- Consider, if not already done so as part of your Medical Threat Assessment, activating the *HELICOPTER UTILIZATION GUIDELINE* for greater than 30 minutes to the trauma center
- For completeness see the following protocols for Tactical Evacuation Care – Note that with the exception of specific trauma interventions performed in Direct and Indirect threat care; the care from this point and for other medical conditions will align best with the General WREMAC PROTOCOL and should be referenced when possible.
- Special consideration should be given to hasty decontamination (Basic) of any individual that was exposed to CS, OC, pepper spray, etc. prior to transportation from the scene. In general, removing exposed clothing is adequate

TEMS: AIRWAY AND BREATHING MANAGEMENT

EMT

- Chin lift or jaw thrust maneuver
- Nasopharyngeal airway insertion
- Attempt to clear any obstruction – suctioning if available
- Administer oxygen or assist with ventilations if required
- If sucking chest wound, cover with occlusive dressing. If dyspnea increases, release the dressing momentarily during exhalation.
- Call for ALS backup

EMT STOP

AEMT

- Place FDA approved supraglottic airway device if no gag reflex
- For penetrating chest trauma, use totally occlusive dressing making sure to check for exit wounds
- Consider CPAP for a spontaneously breathing patient, if appropriately credentialed by medical director (see CPAP procedure)
- Endotracheal intubation (with cervical spine precautions prn) - max 2 attempts.
- Needle thoracostomy (decompression) with signs of tension pneumothorax with penetrating trauma
- Consider causes of altered mental status and refer to those protocols

AEMT STOP

CRITICAL CARE

- For Alerted mental status and respiratory distress after Opiate/Pain Management:
  - Naloxone (Narcan) 0.4 mg IV, may repeat to titrate to adequate ventilation (max of 2mg). If unable to establish IV, give Naloxone 2mg SQ, IM, IO or IN
- If indicated -Perform a needle or percutaneous cricothyrotomy with FDA approved device (if credentialed as per WREMAC PROTOCOL)

CCT STOP

PARAMEDIC

- Medication facilitated endotracheal intubation – if credentialed (PER WREMAC MFI PROTOCOL)

PARAMEDIC STOP

PHYSICIAN OPTIONS

- Needle thoracostomy (needle decompression) for non-penetrating trauma

Key Points/Considerations

- Recall contraindications of chest trauma prior to use of CPAP

TEMS: BLEEDING, HYPOPERFUSION AND SHOCK

EMT

- Refer to Tactical Field Care for initial management
- Place in a position of comfort or recovery position
- **Reassess any placed tourniquet - if tourniquet is not needed, utilize alternative techniques to control less severe bleeding**
- Monitor for symptoms of hypothermia
- Repeat vital signs every 5 minutes (Blood Pressure, Pulse, Respirations and Oximetry if available)

EMT STOP

AEMT

CRITICAL CARE

PARAMEDIC

- Establish vascular access (IV or IO)
- If hemorrhage is from a **COMPRESSIBLE SITE** AND HAS BEEN CONTROLLED, administer Normal Saline up to 2 liters IV to a systolic blood pressure goal of above 120 mmHg.
- If hemorrhage is from a **NON-COMPRESSIBLE SITE** - administer Normal Saline in 250 ml boluses to a goal of a systolic pressure >90 mmHg or return to normal mental status

AEMT, CCT and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Additional Saline Boluses IV or IO
- Fentanyl 0.5-1 mcg/kg slow IV, IM or atomized intranasal
- Additional doses of Morphine IV or IM

Key Points/Considerations

- There is no need to immobilize the cervical spine with only penetrating trauma to the extremities or trunk
- Consider Spinal immobilization for blunt trauma and for patients over 65 years old.
- COMPENSTATED SHOCK is defined as significant mechanism of injury AND tachypnea, tachycardia, pallor, or restlessness, AND Systolic BP greater than 90 mmHg.
- DECOMPENSATED SHOCK is defined as clinical picture of shock AND Systolic BP less than 90 mmHg.
- A falling BP is a LATE sign of shock.

TEMS: REMOTE MEDICAL ASSESSMENT

EMT

AEMT

CRITICAL CARE

PARAMEDIC

- Recommend working with a partner/coach
- Identify yourself as a "Medical Provider"
- Obtain information on:
  - Emergent Medical Conditions
  - Anyone that has medical training that could assist
  - Ask respondent what they can see – number of victims, signs of injury
- Direct assessment and treatment as XABC format
- Provide no more than two steps at a time using simple terms
- Evaluate the response from respondent
- If respondent loses confidence, have your partner take over

EMT, AEMT, CCT and PARAMEDIC STOP

PHYSICIAN OPTIONS

- Provide additional support on interventions that could be explained over the phone

Key Points/Considerations

- The goal is to emphasize reassurance, support and assistance
- Focus should be to address medical problems that may exist with hostages, hostage taker or other individuals barricaded from direct access in a law enforcement environment and communicate that information to the incident command and medical control if needed.
- This may be accomplished via visual, phone, radio – alone or in any combination.
- The goal is to assist the incident commander in determining medical problems that either currently or may exist during the incident by communicating with an individual – with or without medical training – via phone or radio
- At no point will a tactical medical provider have the authority to discuss demands

Appendices

Trauma: ADULT and PEDIATRIC TRAUMA TRIAGE and TRANSPORT

Trauma Patient Characteristics

Transport the patient to the closest appropriate trauma center if any of the following are identified:

Physiologic Criteria

- Glasgow Coma Scale < 14
- Respiratory rate < 10 or > 29 breaths per minute (< 20 breaths per minute if < 1 year old)
- Systolic blood pressure < 90 mmHg (adult) or < (age(yr) x 2) + 70 (pediatric to age 10)

Anatomic Criteria

- Penetrating injuries to head, neck, torso, or proximal extremities
- Two or more suspected proximal long bone fractures
- Suspected flail chest
- Suspected spinal cord injury or limb paralysis
- Amputation proximal to wrist and ankle
- Suspected pelvic fracture
- Suspected open or depressed skull fracture
- Crushed, degloved, mangled extremity

Mechanism of Injury

- Ejection or partial ejection from an automobile
- Death in the same passenger compartment
- Vehicle collision resulting in 12 inches of intrusion to the occupant site or > 18 inches to any site
- Motorcycle crash > 20 MPH
- Falls from > 20 feet
- Vehicle vs. pedestrian / bicycle Thrown, Run Over or with significant impact (> 20 MPH)
- High-Risk Auto Crash - vehicle telemetry data consistent with high risk of injury

Special Considerations

- Age < 15 should be transported to the pediatric trauma center.
- Age > 55: consider triage to trauma center.
- Patients with bleeding disorders or patients on anticoagulant medications: consider trauma center.
- Burn Patients, with trauma mechanism: triage to a trauma center.
- Burn Patients, without trauma mechanism: triage to a burn facility.
- Pregnancy > 20 weeks who meet criteria: transport to an **ADULT** trauma facility.
- Time-sensitive extremity injury
- End Stage renal disease requiring dialysis
- EMS Provider judgment / Medical Direction

HELICOPTER UTILIZATION GUIDELINES

Consider EMS Helicopter Transport

- For patients who meet the Adult and Pediatric Trauma Triage Guidelines and when helicopter transport will significantly reduce the arrival time at the trauma center **OR**
- If specialized services offered by the air medical service would benefit the patient prior to arrival at the emergency department. (Transport by ground if the patient can be delivered to the closest facility prior to helicopter arrival.) **OR**
- In special circumstances including but not limited to Mass Casualty Incidents or to facilitate rescue / extrication.
- ONLY patients with viable signs of life should be transported by helicopter.

Helicopter Services Should Be

- Alerted to a stand by status by any dispatch, EMS, Fire or Police authority as soon as a potential need is identified.
- Requested by on-scene EMS provider with the highest level of training, or in the absence of EMS provider, the decision will be made by the incident commander.
- **PATIENT TRANSPORT SHOULD NOT BE DELAYED WAITING FOR A HELICOPTER UNLESS DIRECTED BY MC.**

Key Points

- Ground EMS services should appropriately triage patients at the scene of multi-casualty incidents to insure the patient, who would benefit from helicopter transport the most, is transported by helicopter.
- Patients from scenes within a 20 mile radius of the trauma center do not routinely have faster transport by helicopter.
- Refer to NY State Bureau of EMS Policy 05-05

IMPLANTED IV ACCESS DEVICES POLICY

Definition

- Implanted IV Access Devices include various products (e.g. Hickman, Groshong, Broviac, Mediport, PICC, etc.). They are used for chronic IV therapy in various disease states. They differ by manufacturer, method of placement (surgical or non-surgical), type of vein utilized (peripheral or central), and duration of placement.

General Considerations

- Implanted IV access devices may be accessed by AEMTs when there is no other IV access obtainable and the patient is in cardiac/respiratory arrest, shock, status epilepticus or an unstable cardiac dysrhythmia
- Consider using the patient's supplies to access the device.
- If the device is no longer in use at the time of development of the emergent condition, MC must be contacted.
- Home peripheral IV and saline trap devices may be accessed routinely by prehospital personnel. Prior to use, patency should be confirmed.
- Most of these devices cannot support high pressure injection. Use with caution with IV push medications.

Procedure

- Clean access port with alcohol or chlorhexidine prior to use
- Attach a 10 mL syringe and draw off 10 mL of blood.
- Flush the port with 10 mL of normal saline to insure patency.
- Attach intravenous line to the port.

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ON-SCENE PHYSICIAN POLICY

Definition

- The direction of Prehospital care at the scene of a medical emergency should be the responsibility of the individual in attendance who is most appropriately trained and knowledgeable in providing prehospital emergency stabilization and transport. The EMS provider is responsible for management of the patient and acts as an agent of New York State Department Of Health (DOH) and his/her Medical Director.
- **If either all of the four conditions below are not met or the on-scene physician is no longer in attendance, the EMS provider must revert to existing EMS protocols.**

Criteria for on-scene physician to take over (must meet all)

- Be currently licensed in New York State.
- Assume all responsibility for the patient's care.
- Realize that EMS providers will not comply with orders that exceed their scope of practice.
- Must accompany the patient to the hospital if requested or needed.

If MC is not available (i.e. communication failure)

- The EMS provider should defer to the orders of the on-scene physician if conditions 1-4 above are met. If not met, the EMS provider must follow existing EMS protocols

If MC is available

- MC is ultimately responsible for the actions of the EMS provider and shall be contacted. If there is any disagreement between the on-scene physician and MC, the EMS provider shall take orders from MC and place the on-scene physician in contact with MC. MC has the option of managing the case entirely, working with the on-scene physician, or allowing the on-scene physician to assume responsibility. The EMS provider and MC may re-establish on-line medical direction if either believes that the care rendered by the on-scene physician is inconsistent with quality care. The decision of the on-scene physician to accompany the patient to the hospital shall be made in consultation with MC.
- The on-scene physician shall document his/her interventions and orders in a manner acceptable to the local EMS system

REFUSAL OF EVALUATION / TRANSPORT POLICY

General

- When EMS personnel are called to a scene, all persons for whom the call was made will be offered evaluation/stabilization and transport to an appropriate facility. An appropriate facility may be the closest, or one designated by REMAC transport policy, or one designated by MC.

Criteria for refusal – All four elements must be present

- The patient is alert, oriented, not intoxicated (drugs or alcohol), and appear to possess the capacity to make informed decision.
- The patient understands the risks involved and the consequences of refusal of treatment.
- The patient is not a danger to themselves or others.
- The patient does not have abnormal vital signs.

Informed Refusal

- The risk of refusal of evaluation/stabilization/transport should be described to the patient.
- The patient shall be informed that EMS personnel lack the benefit of training and diagnostic tools present in an Emergency Department, and may be unable to fully access the illness/injury and may be unable to determine the potential risks to the patient.

Medical Control MUST Be Contacted In The Following Situations

- The patient does not appear to possess capacity to make an informed decision.
- The patient is a danger to themselves or others.
- The patient has abnormal vital signs.
- The patient appears to be intoxicated with drugs or alcohol.
- The patient has sustained a head injury or a loss of consciousness.
- The patient has signs or symptoms that require or required ALS care (e.g. hypoglycemia).
- The highest level of care is a Certified First Responder.
- The patient is under 18 years old and there is no legal parent / guardian available.
- The patient may have been the victim of physical abuse, sexual abuse, neglect, or an unsafe home environment.

Documentation

- The patient or legal representative should sign the refusal of evaluation/stabilization/transport.
- The PCR should be completed including vital signs and a physical examination, including general appearance and mental status.
- Specifically what the patient is refusing
- If police were contacted, agency, time, badge number (as appropriate)
- Components of informed refusal including risks of refusal and how the patient indicated understanding the risks
- The risk of refusal of evaluation/stabilization/transport should be described to the patient.

Police Involvement

- If the patient does not appear to possess capacity to make an informed decision and is a danger to him/herself or others, the patient shall be transported.
- Police should be called to assist if the patient resists transport. The police may restrain the patient per the restraint policy.

RESTRAINT POLICY

Restraints May Be Ordered By:

- Protocol
- Medical Control physician / physician's assistant
- Police

Procedure

- EMS personnel should not risk injury to themselves while restraining an individual. If the potential for injury is significant, the police shall be asked to intervene by EMS personnel.
- Restraints shall be humanely and professionally applied.
- Restraints shall be applied so as not to injure the individual.
- The face and neck shall be avoided.
- The restrained patient shall be placed in a supine position for transport.
- Assess the patient frequently for mental status, adequate respiration, and adequate circulation.
- The use of commercial humane restraints is strongly recommended.

Documentation

- Reason(s) for restraint
- Method of restraint including position
- Frequent timed reassessment of the patient

See dosing chart below for different concentration solutions

Dopamine Dosing Chart
Single Concentration 1.6 mg / ml
800 mg / 500 ml
400 mg / 250 ml
mcg /kg /minute

		1	2	3	4	5	10	15	20
	35	1	3	4	5	7	13	20	26
	40	2	3	5	6	8	15	23	30
	45	2	3	5	7	8	17	25	34
	50	2	4	6	8	9	19	28	38
	55	2	4	6	8	10	21	31	41
Pt	60	2	5	7	9	11	23	34	45
wt	65	2	5	7	10	12	24	37	49
in	70	3	5	8	11	13	26	39	53
Kg	75	3	6	8	11	14	28	42	56
	80	3	6	9	12	15	30	45	60
	85	3	6	10	13	16	32	48	64
	90	3	7	10	14	17	34	51	68
	95	4	7	11	14	18	36	53	71
	100	4	8	11	15	19	38	56	75
	105	4	8	12	16	20	39	59	79
	110	4	8	12	17	21	41	62	83
	115	4	9	13	17	22	43	65	86
	120	5	9	14	18	23	45	68	90

ml/hr or drops/min. using minidrip tubing = 60 drops/ml
Dopamine (Single) Dosing Chart

Dopamine Dosing Chart
Double Concentration 3.2 mg/ml
800 mg/250 ml
mcg/kg/minute

		1	2	3	4	5	10	15	20
	35	1	1	2	3	3	7	10	13
	40	1	2	2	3	3	7	11	15
	45	1	2	3	3	4	8	13	17
	50	1	2	3	4	5	9	14	19
	55	1	2	3	4	5	10	15	21
	60	1	2	3	5	6	11	17	23
	65	1	2	4	5	6	12	18	24
	70	1	3	4	6	7	13	20	26
Pt wt	75	1	3	4	6	7	14	21	28
in Kg	80	2	3	5	6	8	15	23	30
	85	2	3	5	7	8	16	24	32
	90	2	3	5	7	8	17	25	34
	95	2	4	5	8	9	18	27	36
	100	2	4	6	8	9	19	28	38
	105	2	4	6	8	10	20	30	39
	110	2	4	6	9	10	21	31	41
	115	2	4	6	9	11	22	32	43
	120	2	5	7	9	11	23	34	45

ml/hr or drops/min. using minidrip tubing = 60 drops/ml
Dopamine (Double) Dosing Chart

Epinephrine: 1-10 mcg/min titrated to desired effect

Formulary

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
2-PAM Trade: Class:	62	• antidote for organophosphorus (nerve agent/insecticide) poisoning		
Adenosine Trade: Adenocard Class: Antidysrhythmic, Nucleoside	17, 46	• SVT	•Patients with known A-fib • Patients with known A-flutter • 2nd and 3rd degree block • Sick sinus syndrome • Known hypersensitivity	• Facial flushing • Headache • Dizziness • Dyspnea • Nausea/vomiting • Chest pain • Transient asystole
Albuterol Trade: Proventil, Ventolin Class: B_2 selective sympathomimetic	11, 12, 13, 22, 35, 47, 48, 49	• Asthma • Reversible bronchospasm associated with COPD or bronchitis • Allergic reactions • Smoke inhalation	• Know hypersensitivity • Symptomatic tachycardia • Chest pressure	• Tachycardia • Hypertension • Palpations • Dizziness • Dysrhythmias • Nausea • Chest pain
Amiodrone Trade: Cordarone Class: Antidysrhythmic	17, 19, 43, 46, 57	• VF • Pulseless VT	• 2nd and 3rd degree block • CHF • Bradycardia	• Torsade de pointes • Asystole • Bradycardia • Pulmonary fibrosis

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Anesthetic spray or Lidocaine jelly Trade: Class: Local anesthetic	7, 41	• Advanced airway procedure	• Known hypersensitivity to local anesthetics	• Bradycardia • Hypotension • Arrhythmias
Aspirin Trade: Various Class: Antiplatelet	14, 21	• Cardiac chest pain	• Known hypersensitivity • Hypersensitivity to salicylates • Peptic ulcer disease	• Nausea/vomiting • Hepatotoxicity • Occult blood loss • Anaphylaxis
Atropine sulfate Trade: Atropine sulfate , Atropen Class: Parasympathetic blocker	16, 27, 45, 53, 62, 63	• Asystole • Symptomatic bradycardia • PEA • Organophosphate poisoning • Nerve agent exposure	• None in emergency situations	• Tachycardia • Blurred vision • Dilated pupils • Palpitations • Drowsiness • Confusion
Atrovent Trade: Atrovent Generic: ipratropium bromide Class: Anticholinergic bronchodilator	11, 12	• bronchospasm	• Known hypersensitivity • Hypersensitivity to Atropine	• Headaches • Dizziness • Tachycardia • Palpitations
CANA Kit Generic: Class:	62	• antidote for organophosphorus (nerve agent/insecticide) poisoning		

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Calcium chloride 3 Trade: CaCl Class: Inotropic agent (electrolyte)	27, 35, 53	• Hyperkalemia • Overdose of calcium channel blocker	• Patients taking digitalis based medications	• Bradycardia • Hypotension • Syncope
Cimetidine Trade: Tagamet Class: Selective antihistamine (H2) blocker	22	• Allergic reaction	• Known hypersensitivity	• Diarrhea • Headaches • Confusion
Cyanokit Generic: hydroxocobalamin Class:	13	• suspected cyanide poisoning	• None in emergency situations	• Chromaturia (red colored urine) • Erythema • Blood pressure increased
Dextrose (D_{10}) Trade: Glucose Class: Hyperglycemic agent, hypertonic solution	24, 36, 50	• Hypoglycemia • Altered mental status	• None in emergency situations	• venous thrombosis or phlebitis • pain and venous irritation
Dextrose (D_{50}) Trade: Glucose Class: Hyperglycemic agent, hypertonic solution	24, 36, 50	• Hypoglycemia • Altered mental status	• None in emergency situations	• Thrombophlebitis • Rhabdomyolysis

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Diazepam Trade: Valium Class: Sedative, benzodiazepine, anticonvulsant	9, 21, 25, 30, 36, 39, 52, 53, 55	• Seizure • Pre-TCP • Pre-cardioversion	• Shock • Unresponsive patient • Depressed vital signs	• Hypotension • Reflex tachycardia • Respiratory depression • Ataxia • Psychomotor impairment • Confusion • Nausea
Diltiazem Trade: Cardizem Class: Calcium channel blocker	17, 57	• SVT refractory to adenosine • A-fib • A-flutter	• Heart blocks • Hypotension • VT • Wolf Parkinson White SVT	• Headache • Dysrhythmias • N/V • Chest pain
Diphenhydramine Trade: Benadryl Class: Antihistamine	22, 27, 39, 49, 53, 55	• Allergic reactions	• Glaucoma • Acute asthma • COPD • Pregnancy • Hypertension	• Hypotension • Drowsiness • Tachycardia • Bradycardia • Palpitations
Dopamine Trade: Intropin Class: Sympathomimetic agent (catecholamine)	15, 16, 21, 22, 28, 38, 49, 51	• Bradycardia • Allergic reaction • Shock	• Patients with pheochromocytoma • Hypovolemia	• Hypertension (high dose) • Hypotension (low dose) • Tachycardia • Dyspnea

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Epinephrine 1:1000 Trade: Adrenaline Class: Sympathomimetic agent (catecholamine)	11, 22, 45, 47, 49	• Bronchial asthma • Allergic reaction • Cardiac arrest • Asystole • PEA • VF	• Hypertension • Hypovolemia • Narrow angle glaucoma	• Headache • Nausea • Restlessness • Weakness • Dysrhythmias • Hypertension
Epinephrine 1:10,000 Trade: Adrenaline Class: Sympathomimetic agent (catecholamine)	11, 19, 22, 43, 44, 45, 49, 56	• Bronchial asthma • Allergic reaction • Cardiac arrest • Asystole • PEA • VF	• Hypertension • Hypovolemia • Narrow angle glaucoma	• Headache • Nausea • Restlessness • Weakness • Dysrhythmias • Hypertension
Etomidate Trade: Amidate Class: Sedative	9	• RSI		• muscle movements • Apnea • Hypotension • Eye movements • Nausea
Famotidine Trade: Pepcid Class: Selective antihistamine (H2) blocker (AEMT-CC/AEMT-P Optional Medication)	22	• Allergic reaction	• Patients with renal insufficiency	• Dysrhythmias • Dizziness • Headache • Nausea
Fluticortisone Trade: Florinef Acetate Class: synthetic adrenocortical steroid	29, 54	• Adrenocortical insufficiency • Adrenal Crisis	• Systemic Fungal Infections	• CHF • Edema • Hypertension

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Fentanyl Trade: Class: narcotic (opioid) analgesic	33, 34, 35, 37, 39, 55, 80	• Analgesia	• known intolerance to the drug	• Respiratory depression • Tachycardia • Dizziness
Furosemide Trade: Lasix Class: Diuretic	12	• Acute pulmonary edema • Congested heart failure	• Hypotension • Pregnancy • Anuria	• Hypotension • Dehydration • Hyperglycemia • Tinnitus • Hypokalemia • Ototoxicity
Glucagon Trade: none Class: Hyperglycemic agent (pancreatic hormone)	24, 27, 36, 50, 53	• Alcohol abuse • Beta blocker OD • Hypoglycemia	• Hypersensitivity • Patients with pheochromocytoma	• Tachycardia • Hypertension • N/V
Hydrocortisone Trade: Class: Steroid	29, 54	• Adrenal Crisis	• Hypersensitivity	• Hives • Shortness f Breath • Swelling of throat, lips, tongue
Ipratropium Trade: Atrovent Class: Parasympatholytic Bronchodilator	47	• Asthma • COPD	• Hypersensitivity to atropine	• Blurred vision • Bitter taste • Nausea • Headache
Ketamine HCL Trade: Ketalar Class: Dissociative anesthetic, hallucinogen, psychotomimetic	9, 30	• Medication Facilitated Intubation • Excited Delirium Syndrome	• Hypersensitivity to drug • Significant hypertension	• Anxiety • Chest Pain • Delirium • Seizures

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Ketorolac Trade: Toradol Class: NSAID	39	• Pain management	• Hypersensitivity to drug • Peptic ulcer disease, recent GI bleeding or perforation, • Advanced renal impairment • Nursing women	• Abdominal pain • Diarrhea, dizziness, drowsiness, • Headache, indigestion, nausea
Lorazepam Trade: Ativan Class: Sedative, benzodiazepine	9, 21, 25, 30, 36, 39, 52, 53, 55	• Seizure • Pre-TCP • Pre-cardioversion	• Pregnancy/Nursing mother	• Amnesia • Drowsiness • Hypertension • Hypotension • Weakness
Magnesium sulfate Trade: Same Class: Antidysrhythmic, electrolyte	11, 17, 19, 25, 43, 47	• Refractory VF / Pulseless VT • Torsades de Pointes • Seizures related to eclampsia	• Heart block	• Diaphoresis • Hypotension • Bradycardia • Dysrhythmias • Depressed reflexes
MARK-I atropine and pralidoxime chloride injection	62	• antidote for organophosphorus (nerve agent/insecticide) poisoning	• None in emergency situations	
Methylprednisolone Trade: Medrol Class: Synthetic corticosteroid	11, 22, 29, 47, 49, 54	• Allergic reaction • Bronchospasm	• Hypersensitivity to corticosteroids	• CHF • Seizure • Hypertension • Dizziness • Diaphoresis
Metoprolol Trade: Lopressor Class: Beta-blockers	15, 17, 21	• MI • Angina • Hypertension	• heart block • sick sinus syndrome, • slow heart rate.	• Chest Pain • Syncope • Shortness of Breath

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Midazolam Trade: Versed Class: benzodiazepine	9, 21, 25, 27, 30, 35, 36, 39, 52, 53, 55	• Sedation • Seizure	• Hypersensitivity	• respiratory depression • apnea • respiratory and/or cardiac arrest
Morphine Trade: Same Class: Narcotic analgesic	14, 15, 33, 34, 35, 37, 39, 55, 80	• Cardiac chest pain • Non-cardiac pain management	• Hypersensitivity • Diarrhea caused by poisoning • Hypovolemia • Hypotension • Head injury	• Hypotension • N/V • Tachycardia • Bradycardia • Syncope • Respiratory depression • Seizure
NAAK Trade: Mark 1 atropine and pralidoxime chloride injection	62	• antidote for organophosphorus (nerve agent/insecticide) poisoning	• None in emergency situations	
Naloxone Trade: Narcan Class: Narcotic antagonist	27, 53, 79	• Altered mental status • Narcotic OD • Neonatal resuscitation	• Hypersensitivity	• Tachycardia • Hypertension • Dysrhythmias • N/V • Diaphoresis

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Nitroglycerine ointment and/or tablets Trade: Nitrostat Class: Vasodilator	12, 14, 15	• Cardiac chest pain • Congested heart failure	• Hypersensitivity • Pericardial tamponade • Restrictive cardiomyopathy • Constrictive pericarditis • BP < than 100 mm Hg or if a drug for erectile dysfunction taken with in 24 hours	• Transient headache • Postural syncope • Reflex tachycardia • Hypotension • N/V • Diaphoresis
Ondansetron Trade: Zofran Class: Antiemetic	39, 55	• Nausea and Vomiting	• Hypersensitivity	• Headache • Bradycardia • Hypotension • Drowsiness
Oral Glucose Trade: Glucose Class: Hyperglycemic agent,	24, 50	• Hypoglycemia • Altered mental status/conscious	• Unconsciousness	• Aspiration
Prednisone Trade: Deltasone Class: Steroid	11, 22, 47	• Allergic reaction • Bronchospasm	• Hypertension • Kidney disorders • Peptic ulcers • Osteoporosis	• Euphoria • Hypertension
Procainamide Trade: Pronestyl, Procan Class: Antidysrhythmic	17	• Refractory VF • VT	• Myasthenia gravis • 2nd and 3rd degree blocks	• Dizziness • Hypotension • AV block • VF • Tachycardia

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Ranitidine Trade: Zantac Class: Selective antihistamine (H2) blocker	22	• Allergic reaction	• Hypersensitivity	• Anemia • Headache • Dizziness • N/V/D • Bradycardia
Rocuronium Trade: Zemuron Class: Non-depolarizing neuromuscular blocker, skeletal muscle relaxant	9	• Medication Facilitated Intubation	Hypersensitivity	• Brady-or-Tachycardia • Hyper-or-Hypotension • Bronchospasm • Anaphylaxis-rash • Hypothermia • Excessive salivation
Sodium Bicarbonate Trade: Same Class: Alkalinizing agent, Electrolyte	27, 30, 35, 53	• Cardiac arrest • OD	Patients with chloride loss from: • nausea or vomiting • Metabolic and respiratory • alkalosis • Hypocalcemia • Hypokalemia	• Metabolic alkalosis • Hypoxia • Seizure • Rise in intercellular PCO_2 and increased tissue acidosis
Sodium Thiosulfate Trade: Pentahydrate Class: Cyanide antagonist	13, 48	• Smoke inhalation/cyanide poisoning • Toxic exposure	• None known	• Blurred vision • Muscle cramps • N/V
Succinylcholine Trade: Anectine Class: Neuromuscular Blocker (Depolarizing)	9	• Facilitate Intubation • Terminate Laryngospasm • Muscle relaxation	• Penetrating eye injury • Inability to control the airway	• Hypotension • Bradycardias • Dysrhythmias • Allergic reactions

Generic/Trade name Classification	Reference Page	Indications	Contraindications	Adverse Effects
Terbutaline Trade: Brethine Class: Sympathomimetic agent, bronchodilator	11, 47	• Asthma	• Hypersensitivity	• Dizziness • Tachycardia • N/V • Diaphoresis
Vasopressin Trade: Pitressin Class: Hormone, vasopressor	19, 20	• VF	• None in cardiac arrest	• Tremor • Diaphoresis • Vertigo • Drowsiness • N/V • Headache • Seizure • Coma
Vecuronium Trade: Norcuron Class: Skeletal muscle relaxant/ neuromuscular blocker	9	• RSI for muscle paralysis	• Hypersensitivity	• Allergic reaction • Extreme or ongoing muscle weakness
Verapamil Trade: Calan, Isoptin Class: Calcium channel blocker	17	• PSVT refractory to adenosine • A-fib • A-flutter	• WPW • AV blocks • Hypotension • CHF • Cardiogenic shock • Digitalis toxicity • Cardiomegaly	• Headache Hypotension • Bradycardia • CHF • Severe tachycardia • AV block • Nausea