



# NYC REMAC

## PUBLIC NOTICE

### PROPOSED REVISIONS PREHOSPITAL TREATMENT PROTOCOLS

The Regional Emergency Medical Advisory Committee (REMAC) of New York City Prehospital Treatment Protocols define the minimum standard of care provided to patients by Certified First Responders (CFRs), Emergency Medical Technicians (EMTs), and Advanced Emergency Medical Technicians-Paramedic (AEMT-Ps) in New York City. These protocols reflect both the curriculum and certification requirements of the New York State Department of Health Bureau of Emergency Medical Services and the Regional Emergency Medical Advisory Committee (REMAC) of New York City.

**The REMAC of New York City has proposed revisions to the current regional Rescue Paramedic Protocols.**

In order to meet regional needs, the REMAC of New York City is conducting a public notice and is requesting comments from the Emergency Medical community. Comments must be submitted in writing on the attached 'Comment Form' or via email to [mdiglio@nycremsco.org](mailto:mdiglio@nycremsco.org). If available, appropriate supporting documentation should also be submitted. **Comments must be received no later than September 27, 2019.**

**Draft revised protocols can be reviewed on-line at [www.nycremsco.org](http://www.nycremsco.org) (under "News and Announcements"). All NYC REMAC Protocols can be accessed in their entirety at [www.nycremsco.org](http://www.nycremsco.org).**

Date Distributed/Posted: September 27, 2019

**DIRECT ALL INQUIRES AND COMMENTS TO:**

**Jessica van Voorhees, MD**  
**Chair, Protocol Committee**  
**Regional Emergency Medical Advisory Committee of New York City**  
**c/o Regional EMS Council of NYC**  
**475 Riverside Drive, Suite 1929**  
**New York, New York 10115**  
**Email: [mdiglio@nycremsco.org](mailto:mdiglio@nycremsco.org)**

**PLEASE BE ADVISED THAT** pursuant to Section 3004-A of Article 30 of the Public Health Law of the State of New York, the Regional Emergency Medical Advisory Committee (REMAC) of New York City is responsible to develop prehospital triage, treatment, and transportation protocols that are consistent with the standards of the State Emergency Medical Advisory Committee and that address specific local conditions with regards to the provision of prehospital medical care rendered by NYS Department of Health certified First Responders, Emergency Medical Technicians and Advanced Emergency Medical Technicians within the City of New York.

THE REGIONAL EMERGENCY MEDICAL SERVICES COUNCIL OF NEW YORK CITY, INC.

**Regional Emergency Medical Advisory Committee (REMAC) of New York City  
Protocol Revision Comment Form**

Name:	
Mailing Address:	
Telephone Number:	Fax Number:
e-mail:	Title (e.g., MD, DO, EMT, EMTP, RN, etc.):

Protocol Number: N/A	Protocol Title: <a href="#">Rescue Paramedic Protocols</a> (revised)
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**Comments: (Please Type)**

  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
**(Continue on additional sheet if necessary)**

If available, appropriate supporting documentation should be submitted

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**This form may be duplicated as needed**

# THE REGIONAL EMERGENCY MEDICAL SERVICES COUNCIL OF NEW YORK CITY

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

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**These General Operating Procedures and Protocols Apply ONLY to FDNY Rescue Paramedics**

### **Purpose**

To establish protocols defining the scope of the New York City Fire Department's (FDNY) Advanced Emergency Medical Technician - Paramedic (AEMT-P) Rescue Units (i.e. Rescue Paramedics) operating in the pre-hospital 911 system during Special Operations.

### **Scope**

The New York City Fire Department has extensively trained a select group of AEMT-Ps to perform advanced pre-hospital emergency medical care in the Special Operations environment. The Rescue Paramedics may operate under these protocols when they are utilized as a specialty resource, or when determined necessary by an on-duty HazTac Officer. The Fire Department has established specific protocols, contained herein, that shall be used exclusively by these Paramedics when operating as a specialty resource. Rescue Paramedics may be required to perform advanced pre-hospital emergency care as a single provider. These protocols are guidelines that should be used in conjunction with good clinical judgment and are intended to be utilized with existing New York City Regional Emergency Medical Advisory Committee (REMAC) General Operating Procedures and Protocols.

### **Training**

All Rescue Paramedics have met New York State Department of Health Bureau of Emergency Medical Services and REMAC of New York City requirements. The Rescue Paramedics are FDNY Hazardous Medical Technicians and are graduates of the FDNY Technical Rescue School. Additionally, Rescue Paramedics are trained to use specialized medications and medical equipment. Training records are maintained at the FDNY HazTac Battalion.

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

### FDNY Rescue Paramedics General Operating Procedure

This general operating procedure and protocols are designed for use specifically by FDNY EMS Paramedics that have been trained and credentialed to the level of "Rescue Paramedic." Any treatment beyond standing orders requires direction from an OMA Response Physician.

**NOTE:** Medication dosages are for adult and pediatric patients unless otherwise specified

### Initial Management

1. Begin Basic Life Support procedures
2. Begin cardiac and pulse oximetry monitoring as soon as conditions permit
3. When appropriate, place personal protective equipment on the patient, including helmet, eye protection, and ear protection. Protect the patient's airway from particulates using any of the following:
  - a. Surgical mask
  - b. N95 mask
  - c. P 100 mask
  - d. Non-rebreather O<sub>2</sub> mask
  - e. SCBA mask:
    - i. SCBA mask and breathing circuit may be used for patients who are members of service and have been fit tested (any agency)
    - ii. SCBA mask may be used as a loose-fitting protective device with free flow air for all other patients
4. Begin airway management (Protocol 4: Airway Management)
5. Establish intravenous access using an age appropriate large bore IV catheter or intraosseous access at extremity and sternal sites. Administer Lactated Ringers (LR) or Normal Saline (NS) to maintain a systolic blood pressure (SBP) of at least 80 mmHg or normal mental status
  - a. In the presence of Traumatic Brain Injury (TBI), use a SBP  $\geq$  90 mmHg as an end point for fluid resuscitation
  - b. For patients with suspected traumatic injury that require fluid administration, administer warm fluids when available

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

**NOTE:** Except in adult patients with concomitant TBI or pediatric patients, fluid resuscitation in the setting of trauma is guided by a permissive hypotension strategy

LR is the preferred crystalloid solution in the Special Operations environment unless otherwise specified (i.e. Prolonged Field Care, Protocol 1: Compressive Syndrome, Protocol 2: Environmental Emergencies-Hypothermia)

- c. If intraosseous access is established on a conscious patient, infuse preservative-free 2% Lidocaine 0.5 mg/kg IO (maximum 50 mg) prior to infusion
  - e. For continued discomfort or pain due to infusion, repeat preservative-free 2% Lidocaine 0.25 mg/kg IO (maximum 25 mg)
6. Administer Tranexamic Acid 1 g IV/IO (Pediatric: 15 mg/kg IV/IO, maximum 1 g) by mixing the Tranexamic Acid in 100 ml of crystalloid solution (D<sub>5</sub>W, NS, or LR). Tranexamic Acid shall be administered when all of the following conditions are met:
- a. Suspected internal hemorrhage
  - b. Delay in transport
  - c. Patient's injury occurred less than three (3) hours of Tranexamic Acid administration
7. Field blood product transfusion for patients with suspected massive hemorrhaging shall be administered by OMA Response Physicians and Rescue Paramedics in the Special Operations environment
- a. Blood components to be administered in the field:
    - i. Type O<sup>-</sup> pRBCs
    - ii. Type AB plasma
    - iii. Type O<sup>-</sup> whole blood (if available)
  - b. Blood Transportation and Monitoring:
    - i. Following notification of a field blood transfusion (Protocol 7: Blood Transfusion for Suspected Massive Hemorrhage), a Fire Department representative will be assigned to obtain the required blood products from a designated Blood Bank (Appendix B: Designated NYC Blood Banks)
    - ii. The closest available designated Blood Bank will place either four (4) units of type O<sup>-</sup> pRBC and four (4) units of type AB thawed plasma; or four (4) units of type O<sup>-</sup> whole blood into a Thermal Insulated Container (TIC). A time-and-date seal will be placed on the TIC and shall remain intact until arrival at the scene

**NOTE:** In the event that thawed Type AB plasma is not available, low-titer Type A may be used for transfusion

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

- iii. If multiple patients are identified that require blood product transfusion, a separate TIC will be assigned for use with each patient, depending upon TIC and blood product availability. Each TIC will be labelled for use for each patient per 7.e.v. and 7.e.vi as below
- c. The temperature within the TIC shall be maintained between 33.8-42.8 °F (1-6 °C). A temperature monitoring device within the TIC will monitor and record the temperature
- d. Upon arrival on the scene, the TIC containing the blood products will be given to the HazTac Officer or the OMA Response Physician
- e. Blood Product Administration Guidelines
  - i. Blood products shall remain in the TIC until needed for transfusion
  - ii. Blood products must be administered within four (4) hours of removal from the TIC. Any blood products that have been removed from the TIC longer than four (4) hours, whether partially used or unused, must be discarded as biohazard waste
  - iii. Only OMA Response Physicians can order and initiate blood product therapy. Blood product therapy will be closely monitored by the OMA Response Physician and Rescue Paramedics
  - iv. At least two (2) patient identifiers must be used prior to initiation of blood product transfusion; including, name, assigned ePCR number or social security number
  - v. If the patient is unable to give identifying information due to clinical condition, then the patient shall be identified as "TRAUMA#, STAT" in all patient care documentation. The "#" refers to the corresponding ordinal number designation of the entrapped patients in cases where multiple patients requiring blood product transfusion have been identified
  - vi. Transfusion shall be initiated with type AB Plasma followed by type O<sup>-</sup> pRBC or type O<sup>-</sup> whole blood as per Protocol 7: Blood Transfusion for Suspected Massive Hemorrhage
    - A. Obtain and record pre-transfusion vital signs, including temperature. If the current operational situation does not allow for temperature measurement; it should be measured at the first available opportunity
    - B. Standard precautions, including the use of gloves and protective eyewear, shall be used when handling blood products
    - C. All blood products shall be administered through a dedicated large bore IV/IO using blood tubing that has been flushed with Normal Saline

**NOTE:** Do not add any medications or IV fluids to the blood products

Standard blood tubing with an in-line filter must always be used when transfusing blood products

- D. Prior to transfusion, two (2) EDTA pink-top blood tubes shall be drawn from the patient and labelled with the patient name (or "TRAUMA#, STAT" if applicable), ePCR number, date, and initials of the person drawing the specimen

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

- E. Visually inspect each blood product unit to ensure it is free of any gross abnormalities
  - F. Ensure that the blood product is not expired by verifying the expiration date
  - G. Ensure that the blood product to be transfused are type AB plasma and type O<sup>-</sup> pRBCs or type O<sup>-</sup> whole blood if available
  - H. Blood should be transfused through a blood warming device when available
  - I. Start the transfusion at a slow rate of approximately 50 ml over 15 minutes in a non-extremis patient. Continually monitor the patient during the first 15 minutes. If there are no signs or symptoms of an adverse reaction, the flow rate may be increased
  - J. If the patient is in extremis, blood product infusion shall be initially administered at a high flow rate using a pressure bag (150-300 mmHg) or IV pump rated for blood transfusion
  - K. Continuously monitor the patient during the first 15 minutes of blood product transfusion. Check and record vital signs (including temperature if opportunity allows) after the first 15 minutes of infusion, and then at the end of each unit
  - L. Observe patient for signs and symptoms of reaction to blood products including: chills, back or chest pain, hives, rash, fever, and/or wheezing, shortness of breath (Appendix A: Blood Transfusion Reactions). Refer to Reaction to Blood Products section in Protocol 7: Blood Transfusion for Suspected Massive Hemorrhage if these occur
- f. The transfused patient shall be transported to the nearest trauma center
  - g. Upon completion of the assignment, any unused blood products shall be returned to the Blood Bank from which it was dispensed
  - h. Training/Quality Assurance:
    - i. Only Rescue Paramedics who are trained and approved by OMA will be allowed to assist with blood product transfusion
    - ii. A mandatory QA/QI review shall be performed any time blood products are transfused in the field
8. Monitor patient for hypothermia or hyperthermia and provide necessary treatment as per Protocol 2: Environmental Emergencies
- NOTE:** For patients with suspected traumatic injury, ensure the patient is kept warm using external warming measures and warm fluids as appropriate
9. For sedation refer to Protocol 5: Sedation
10. For pain management refer to Protocol 6: Pain Management
11. For case of an entrapped patient with either a difficult extrication or rapid deterioration of the patient and/or environment, and when all other means of safely extricating the patient have been exhausted, consider discussing with the OMA Response Physician for limb amputation as a procedure of last resort (Appendix F: Limb Amputation)

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

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### Prolonged Field Care

1. Re-assess and re-evaluate the patient for any changes in condition
2. Consider re-administration or discontinuation of any medications, fluids, and/or treatments
  - a. Tourniquets shall be assessed for conversion to hemostatic or pressure dressings as conditions permit unless the patient is in shock, the wound cannot be monitored for re-bleeding, or the tourniquet is applied to an amputated extremity

**NOTE:** Re-administration or discontinuation of medications, fluids, and/or treatments shall be discussed with the OMA Response Physician
3. Assess equipment for any needed rehabilitation or replacement as available
4. Repeat any point-of-care testing as appropriate
5. Consider oral intake for fluids and/or medications if patient is capable of swallowing and protecting the airway
6. For patients who require maintenance intravenous fluids, administer D<sub>5</sub> ½ NS based on ideal body weight according to the following:
  - < 10 kg: 4 ml/kg/hr
  - 10 – 20 kg: 40 ml/hr + 2 ml/kg/hr (for every kg over 10 kg)
  - > 20 kg: 60 ml/hr + 1 ml/kg/hr (for every kg over 20 kg, maximum 120 ml/hr)

**NOTE:** Patients may require more or less maintenance fluids depending on clinical and environmental conditions

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### OMA RESPONSE PHYSICIAN MEDICAL CONTROL / PROLONGED FIELD CARE OPTIONS

1. Consider foley insertion by the OMA Response Physician to monitor urine output especially in cases of Compressive Syndrome or severe burns
2. Consider administering Furosemide 0.5 mg/kg IV/IO (maximum 40 mg) for hypervolemia
3. Consider administering prophylactic antibiotics for patients with open or penetrating traumatic injuries, surgical procedures and/or a delay in transport under the direction of an OMA Response Physician

OPTION A: Ertapenem 1 g IV/IO/IM (Pediatric: 15 mg/kg IV/IO/IM, maximum 500 mg)

OPTION B: Cefotetan 2 g IV/IO/IM (Pediatric: 30 mg/kg IV/IO/IM, maximum 2 g)

**NOTE:** Consider administering Ertapenem for patients who are allergic to Penicillin



**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

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**Procedures**

1. Maintain standard universal precautions as conditions permit
2. Prepare procedure field with antiseptic solution as available
3. For sedation and pain management, see Protocol 5: Sedation and Protocol 6: Pain Management
4. Certain procedures are critically time sensitive, and when indicated, are to be performed only by the OMA Response Physician (Appendix F: Peripheral Nerve Block, Appendix G: Limb Amputation, Appendix H: Escharotomy, Appendix I: Fasciotomy, Appendix J: Suprapubic Needle Cystostomy, Appendix K: Lateral Canthotomy)

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**PROTOCOLS**

1. COMPRESSIVE SYNDROME
2. ENVIRONMENTAL EMERGENCIES
3. BURNS
4. AIRWAY MANAGEMENT
5. SEDATION
6. PAIN MANAGEMENT
7. BLOOD TRANSFUSION FOR SUSPECTED MASSIVE HEMORRHAGE

**APPENDICIES**

- A: BLOOD TRANSFUSION REACTIONS
- B: DESIGNATED NYC BLOOD BANKS
- C: KETAMINE INFUSION DRIP RATES
- D: MECHANICAL VENTILATOR
- E: CRICOTHYROTOMY
- F: PERIPHERAL NERVE BLOCKS
- G: LIMB AMPUTATION
- H: ESCHAROTOMY
- I: FASCIOTOMY
- J: SUPRAPUBIC NEEDLE CYSTOSTOMY
- K: LATERAL CANTHOTOMY

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**1.**

**COMPRESSIVE SYNDROME**

**NOTE:** Consider that the entrapped patient may be in the early stages of Compressive Syndrome based on the amount of compressive force, involved muscle mass and duration of time

1. Perform initial management
2. Obtain and record baseline EKG
3. Administer IV fluids and treat for hyperkalemia according to the following Adult and Pediatric Guidelines listed below
4. Obtain urine and test for pH and the presence of hemoglobin/myoglobin via point-of-care testing, if possible and as available. Maintain urine pH  $\geq$  6.5
5. Obtain blood and test for electrolyte abnormalities via point-of-care testing, if possible and as available
6. If possible and appropriate, consider placing a loose tourniquet on the affected extremity proximal to the injury that may be quickly tightened in the event of unrecognized and/or uncontrolled bleeding during extrication or if immediate evacuation is required

**ADULT:**

1. Administer isotonic Sodium Bicarbonate solution 20 ml/kg (maximum 2 L) IV/IO bolus by mixing three (3) ampules of 7.5% Sodium Bicarbonate (44 mEq in 50 ml) in D<sub>5</sub>W 1 L

**NOTE:** Remove 150 ml of D<sub>5</sub>W prior to adding Sodium Bicarbonate

2. Administer Lactated Ringers 20 ml/kg (maximum 2 L) IV/IO at 1 L/hr
3. For patients with EKG findings or point-of-care testing consistent with hyperkalemia:
  - a. Administer 10% Calcium Gluconate or 10% Calcium Chloride 1 g IV/IO slowly over 2 minutes

**NOTE:** Discontinue Calcium administration if severe bradycardia develops

- b. Administer 0.5% Albuterol 20 mg nebulized
- c. If possible, obtain a blood glucose level and administer D<sub>50</sub> IV/IO as follows:
  - i. D<sub>50</sub> 50 g IV/IO for serum glucose  $\leq$  60 mg/dl
  - ii. D<sub>50</sub> 25 g IV/IO for serum glucose  $>$  60 mg/dl and  $<$  300 mg/dl
  - iii. Do not administer D<sub>50</sub> for serum glucose  $\geq$  300 mg/dl
  - iv. D<sub>50</sub> 25 g IV/IO if unable to obtain serum glucose level
- d. Administer Regular Insulin 10 Units IV/IO

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

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**OMA RESPONSE PHYSICIAN MEDICAL CONTROL / PROLONGED FIELD CARE OPTIONS**

1. For patients with persistent EKG findings or point-of-care testing consistent with hyperkalemia, administer additional dosing of medications to treat hyperkalemia
2. Monitor urine output using foley catheter and titrating fluids such that urine output is as follows:
  - a. Adult: Urine output goal 0.5 ml/kg/hr
  - b. Pediatric: Urine output goal 0.5-1 ml/kg/hr
3. Administer Mannitol 0.25 g/kg IV/IO with in-line filter over 30 minutes if renal failure/insufficiency is suspected AND the patient produces urine
4. Consider fasciotomy to be performed by the OMA Response Physician for cases of compartment syndrome and delayed transport (Appendix I: Fasciotomy)

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

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**PEDIATRIC:**

1. Administer isotonic Sodium Bicarbonate solution 20 ml/kg (maximum 2 L) IV/IO bolus by mixing three (3) ampules of 7.5% Sodium Bicarbonate (44 mEq in 50 ml) in D<sub>5</sub>W 1 L

**NOTE:** Remove 150 ml of D<sub>5</sub>W prior to adding Sodium Bicarbonate

2. Administer Lactated Ringers IV/IO according to the patient's weight as follows:
  - < 10 kg: 4 ml/kg/hr
  - 10 - 20 kg: 40 ml/hr + 2 ml/kg/hr (for every kg over 10 kg)
  - > 20 kg: 60 ml/hr + 1 ml/kg/hr (for every kg over 20 kg, maximum 120 ml/hr)
3. For patients with EKG findings or point-of-care testing consistent with hyperkalemia:
  - a. Administer 10% Calcium Gluconate 100 mg/kg (1 ml/kg) or 10% Calcium Chloride 20 mg/kg (0.2 ml/kg) IV/IO slowly over 3-5 minutes  
**NOTE:** Discontinue Calcium administration if severe bradycardia develops
  - b. Administer 0.5% Albuterol nebulized according to patient weight as follows:
    - i. < 30 kg: 0.5% Albuterol 10 mg nebulized
    - ii. ≥ 30 kg: 0.5% Albuterol 20 mg nebulized
  - c. If possible, obtain blood glucose level and administer Dextrose IV/IO according to patient age as follows:
    - i. < 5 yr: D<sub>10</sub> 5 ml/kg IV/IO
    - ii. ≥ 5 yr: D<sub>25</sub> 2 ml/kg IV/IO
  - d. Administer Regular Insulin 0.1 Units/kg IV/IO (maximum 10 Units)

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**OMA RESPONSE PHYSICIAN MEDICAL CONTROL / PROLONGED FIELD CARE OPTIONS**

1. For patients with persistent EKG findings or point-of-care testing consistent with hyperkalemia administer additional dosing of medications to treat hyperkalemia
2. Consider fasciotomy to be performed by the OMA Response Physician for cases of compartment syndrome and delayed transport (Appendix I: Fasciotomy)

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**2.**

**ENVIRONMENTAL EMERGENCIES**

**ADULT/PEDIATRIC:**

**Hyperthermia**

1. Perform initial management
2. Remove excessive clothing as possible
3. Obtain core temperature, if possible and as available
4. If unable to move the patient to a cooler environment, cool the patient by wrapping the patient in sheets soaked in cold water or placing ice packs in the neck, axillary, and the groin regions.
5. For fluid-dependent hyperthermia, administer LR or 0.9% NS 20 ml/kg (maximum 2 L) IV/IO bolus, unless contraindicated
6. If the patient has excessive shivering during cooling administer:  
OPTION A: Midazolam 0.1 mg/kg (maximum 2 mg), IV/IO. Repeat doses of Midazolam 0.1 mg/kg, IV/IO as needed (maximum cumulative dose 5 mg)  
OPTION B: Diazepam 0.5 mg/kg (maximum 5 mg) IV/IO. Repeat doses of Diazepam 0.5 mg/kg IV/IO as needed (maximum cumulative dose 10 mg)  
OPTION C: Fentanyl 1 mcg/kg (maximum 100 mcg) IV/IO

**Hypothermia**

1. Perform initial management
2. Remove wet clothing as possible
3. Insulate the patient from the ground as possible
4. Cover the patient with a vapor barrier in addition to using blankets, heating sheets and heat packs placed on the chest and upper back
5. Insulate the patient, including the head and neck
6. Protect the patient from evaporative heat loss from the wind or wet clothing
7. Administer warm 0.9% Normal Saline 20 ml/kg (maximum 2 L) IV/IO bolus unless contraindicated

**NOTE:** Patients with moderate to severe hypothermia should be handled gently and kept horizontal as possible to improve circulation and avoid dysrhythmias

If the patient requires assisted ventilations, do not hyperventilate the patient as hypocapnia may reduce the threshold for dysrhythmias

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**3.**

**BURNS**

**ADULT/PEDIATRIC:**

1. Perform initial management
2. For pain management refer to Protocol 6: Pain Management
3. Cover burns with sterile water-impregnated gel burn dressing if available
4. Initiate the following fluid resuscitation for any patient with second degree (partial thickness) or third degree (full thickness) burns whose involved total body surface area (TBSA) exceeds 20%

**ADULT:**

1. Estimate burn size to the nearest 10%
2. For patients weighing between 40-80 kg, administer LR IV/IO at a rate according to the following formula:
  - $IV \text{ Fluid Rate (ml/hr)} = \%TBSA \times 10$
3. For every 10 kg above 80 kg, increase the rate by 100 ml/hr

**PEDIATRIC:**

1. Administer LR 20 ml/kg IV/IO (maximum 2L)
2. Administer LR IV/IO according to patient's weight as follows:
  - < 10 kg: 4 ml/kg/hr
  - 10 - 20 kg: 40 ml/hr + 2 ml/kg/hr (for every kg over 10 kg)
  - > 20 kg: 60 ml/hr + 1 ml/kg/hr (for every kg over 20 kg, maximum 120 ml/hr)

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

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**OMA RESPONSE PHYSICIAN MEDICAL CONTROL / PROLONGED FIELD CARE OPTIONS**

1. Provide D<sub>5</sub> ½ NS as additional maintenance fluids as follows:
  - < 10 kg: 4 ml/kg/hr
  - 10 - 20 kg: 40 ml/hr + 2 ml/kg/hr (for every kg over 10 kg)
  - 20 kg: 60 ml/hr + 1 ml/kg/hr (for every kg over 20 kg, maximum 120 ml/hr)
2. Monitor urine output using foley catheter and titrating fluids such that urine output is as follows:
  - i. Adult: Urine output goal 0.5 ml/kg/hr
  - ii. Pediatric: Urine output goal 0.5-1 ml/kg/hr
3. Consider escharotomy to be performed by the OMA Response Physician for cases of compartment syndrome and delayed transport (Appendix H: Escharotomy)



**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**4.**

**AIRWAY MANAGEMENT**

**ADULT/PEDIATRIC:**

1. Perform initial management
2. Consider application of non-invasive positive airway pressure device (Continuous or Bi-Level) when appropriate
3. If necessary, perform advanced airway management
  - a. Induction:
    - i. In the spontaneously breathing patient with an intact gag reflex administer:  
OPTION A: Etomidate 0.3 mg/kg IV/IO  
OPTION B: Ketamine 2 mg/kg IV/IO
    - ii. If patient age is < 1 year old, consider Atropine 0.02 mg/kg (minimum 0.1 mg, maximum 1 mg) IV/IO to be administered BEFORE induction agents
    - iii. Consider inducing paralysis by administering Rocuronium 1 mg/kg IV/IO
  - b. Advanced Airway Techniques:
    - i. Intubate using endotracheal tube via direct or video laryngoscopy
    - ii. If unable to obtain endotracheal intubation, supraglottic airway devices may be utilized
    - iii. If adequate airway management cannot be achieved by any other means, perform cricothyrotomy for patients > 8 years old (Appendix E: Cricothyrotomy)
  - c. Post-Airway Management Sedation and Monitoring:
    - i. Patient shall be placed on cardiac respiratory monitor with end-tidal CO<sub>2</sub> as soon as possible
    - ii. For continued sedation after successful advanced airway maneuvers see Protocol 5: Sedation

**ADULTS ONLY**

4. Awake Advanced Airway Placement
  - a. Administer 4% Lidocaine 10 ml using Mucosal Atomizer Device (MAD)
  - b. Administer Midazolam 0.1mg/kg (maximum 2 mg) IV/IO
  - c. Administer Ketamine 1 mg/kg IV/IO

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**5.**

**SEDATION**

**NOTE:** Use waveform capnography if special operation conditions permit

**ADULT/PEDIATRIC:**

**Anxiolysis**

1. If sedation is necessary for anxiolysis in event of difficult or prolonged extrication:

OPTION A: Midazolam 0.1 mg/kg (maximum 2 mg) IV/IO or 0.3 mg/kg (maximum 5 mg) IM/IN

OPTION B: Ketamine 0.5 mg/kg IM/IN

**Procedural**

2. If sedation is necessary for disentanglement or difficult procedure:

OPTION A: Diazepam 0.5 mg/kg IV/IO (maximum 5 mg). Repeat doses of Diazepam 0.5 mg/kg IV/IO as needed (maximum cumulative dose 10 mg)

OPTION B: Midazolam 0.1 mg/kg (maximum 2mg) IV/IO. Repeat doses of Midazolam 0.1 mg/kg IV/IO as needed (maximum cumulative dose 5 mg)

OPTION C: Ketamine 1 mg/kg IV/IO

**Post-Intubation Sedation**

3. For continued sedation after successful advanced airway maneuvers:

OPTION A: Diazepam 0.5 mg/kg IV/IO (maximum 5 mg). Repeat doses of Diazepam 0.5 mg/kg IV/IO as needed (maximum cumulative dose 10 mg)

OPTION B: Midazolam 0.1 mg/kg (maximum 2mg) IV/IO. Repeat doses of Midazolam 0.1 mg/kg, IV/IO as needed (maximum cumulative dose 5 mg)

OPTION C: Ketamine 1 mg/kg IV/IO

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

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**OMA RESPONSE PHYSICIAN MEDICAL CONTROL OPTIONS / PROLONGED FIELD CARE**

1. Consider additional pain medications for analgesia during difficult procedures and post-intubation sedation when only using benzodiazepines
  - a. Fentanyl 1 mcg/kg IV/IO (maximum dose 100 mcg). Repeat doses of Fentanyl 1 mcg/kg IV/IO as needed (maximum cumulative dose 200 mcg)
2. Ketamine infusion for post-intubation sedation:
  - a. Add 10 ml of a Ketamine solution (50 mg/ml concentration) to 250 ml Normal Saline (500 mg/250 ml = 2 mg/ml)
  - b. Administer Ketamine infusion at 1-4 mg/kg/hr (Appendix C: Ketamine Infusion Drip Rates)

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ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

6.

PAIN MANAGEMENT

**ADULT/PEDIATRIC:**

1. Perform initial management
2. Begin cardiac, pulse oximetry, and capnography monitoring if Rescue Operations permit for analgesics with sedative properties
3. Administer an analgesic as below:
  - a. Analgesic medication with sedative properties
    - OPTION A: Morphine 0.1 mg/kg IV/IO/IM (maximum 5 mg). Repeat doses of Morphine 0.1 mg/kg IV/IO/IM as needed (maximum cumulative dose 10 mg)  
**NOTE:** For hypotensive patients with a systolic blood pressure less than 110 mmHg, consider alternative means of pain management to morphine
    - OPTION B: Fentanyl 1 mcg/kg IV/IO or 2 mcg/kg IM/IN (maximum 100 mcg). Repeat doses of Fentanyl 1 mcg/kg IV/IO or 2 mcg/kg IM/IN as needed (maximum cumulative dose 200 mcg)
    - OPTION C: Fentanyl 400 mcg transmucosal (Adult only option)
    - OPTION D: Ketamine 0.3 mg/kg IV/IO or 1 mg/kg IM/IN
  - b. Analgesic medications without sedative properties
    - OPTION A: Acetaminophen 1000 mg PO/IV/IO  
(Pediatric 15 mg/kg PO/IV/IO, maximum 1000 mg)
    - OPTION B: Ibuprofen 600 mg PO (Pediatric 10 mg/kg PO, maximum 600 mg)
    - OPTION C: Ketorolac 30 mg IM or 15 mg IV/IO  
(Pediatric 0.5 mg/kg IM, maximum 30 mg or 0.5 mg/kg IV/IO, maximum 15 mg)

**OMA RESPONSE PHYSICIAN MEDICAL CONTROL OPTIONS / PROLONGED FIELD CARE**

1. For prolonged on-scene operations, additional dosing may be provided at the discretion of the OMA Response Physician  
**NOTE:** Consider combining synergistic medications for optimal analgesic effect and reduction of adverse effects
2. Consider peripheral nerve block to be performed by the OMA Response Physician (Appendix F: Peripheral Nerve Blocks)

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**7.**

**BLOOD TRANSFUSION FOR SUSPECTED MASSIVE HEMORRHAGE**

This protocol is for patients  $\geq 15$  years old with suspected massive hemorrhage in the setting of delayed transport and/or other extraordinary circumstances

**NOTE:** The decision to transfuse blood products must be determined by the OMA Response Physician. Only OMA Response Physicians can initiate blood product therapy

**TRANSFUSION CRITERIA**

Patients with blunt or penetrating traumatic injury with suspected internal hemorrhage and/or external hemorrhage with two or more of the following criteria shall receive pre-hospital blood products:

- Systolic blood pressure  $\leq 90$  mmHg
- Heart rate  $\geq 120$  beats per minute
- Positive abdominal FAST exam

1. Perform initial management

2. Blood Products:

- a. Blood product transfusion shall only be initiated by the OMA Response Physician.
- b. Blood products shall be transfused using either a 1:1 ratio of plasma:pRBC, starting with plasma and repeating as needed; or whole blood, unless adequate resuscitation is achieved with plasma alone or there is a physician order for only one type of blood product

**NOTE:** If possible, transfuse plasma and pRBC simultaneously using multiple IV/IO access. If this is not possible secondary to limited IV/IO access, then **transfuse plasma first**

Transfusion of blood products (plasma, pRBC, whole blood) takes precedence over TXA when IV/IO access is limited

Do not administer TXA through the same IV/IO as blood products

3. Blood products shall be infused using a “Y” tubing administration set for blood transfusion in conjunction with a fluid warming device, if available
4. During transfusion, continue to monitor the patient and observe for potential adverse reactions (Appendix A: Blood Transfusion Reactions)

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

### 5. Adverse Reactions to Blood Products:

For the initial response to all adverse reactions to blood products (Appendix A: Blood Transfusion Reactions) the following shall be performed:

- a. **Stop the infusion** immediately if **ANY** symptoms are present. Disconnect and change the IV tubing or flush the IV tubing with Normal Saline. Keep the vein open with NS
- b. Obtain additional IV/IO access
- c. Obtain a complete set of vital signs (including temperature if opportunity allows) every 15 minutes and continue cardiac monitoring
- d. Re-verify the blood product type (O<sup>-</sup> for pRBC or AB for plasma or O<sup>-</sup> for whole blood)
- e. Save the unused blood

#### Febrile Reaction

- a. Administer Acetaminophen 1000 mg PO/IV/IO
- b. Monitor vital signs every 15 minutes and continue to observe for symptoms

#### Allergic/Anaphylactic Reaction to Blood Products

- a. Administer Diphenhydramine 50 mg IV/IO
- b. Administer Dexamethasone 12 mg IV/IO or Methylprednisolone 125 mg IV/IO over 2 minutes
- c. If medical status deteriorates or there is shortness of breath, signs of bronchospasm, worsening wheezing, hypotension or alteration in mental status, administer Epinephrine (1:1000 solution) 0.3 ml IM every 5 minutes as needed, up to 3 doses

#### Acute Hemolytic Reaction to Blood Products

- a. Infuse LR or NS 20 ml/kg IV/IO bolus
- b. OMA Response Physician shall place a foley catheter to monitor urine output if time and situation permits

#### Transfusion Related Acute Lung Injury (TRALI)

- a. Continuously monitor patient for signs of respiratory distress
- b. If respiratory status deteriorates, provide respiratory support and perform advanced airway management as indicated as per Protocol 4: Airway Management

#### Transfusion Associated Circulatory Overload (TACO)

- a. Continuously monitor patient for signs of respiratory distress and circulatory overload
- b. If respiratory status deteriorates, provide respiratory support and perform advanced airway management as indicated as per Protocol 4: Airway Management
- c. Administer Furosemide 0.5 mg/kg (maximum 40 mg) IV/IO

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

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Sepsis

- a. Administer Acetaminophen 1000 mg PO/IV/IO
- b. If possible, administer Ertapenem 1 g IV/IO/IM
- c. Monitor vital signs every 15 minutes and continue to observe for symptoms

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# THE REGIONAL EMERGENCY MEDICAL SERVICES COUNCIL OF NEW YORK CITY

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

### APPENDIX A:

### BLOOD TRANSFUSION REACTIONS

TYPE OF REACTION	PATHOPHYSIOLOGY	SIGNS AND SYMPTOMS
<b>Febrile Reaction</b>	<ul style="list-style-type: none"> <li>• Result from cytokine accumulation during blood storage or immune or complement mediated</li> <li>• Does not cause hemolysis</li> <li>• Onset: within minutes to hours of transfusion</li> </ul>	<ul style="list-style-type: none"> <li>• Fever (Temperature increase of at least 1 °C [1.8 °F] above baseline)</li> <li>• Chills</li> <li>• Flushing</li> <li>• Nausea</li> <li>• Headache</li> <li>• Vague discomfort</li> <li>• Tachycardia</li> </ul>
<b>Mild Allergic Reaction</b>	<ul style="list-style-type: none"> <li>• Occurs when transfused allergens in plasma activate recipient's IgE antibodies</li> <li>• Marked by release of histamine by recipient's mast cells and basophils</li> <li>• Onset: Immediately or within 24 hours of transfusion</li> </ul>	<ul style="list-style-type: none"> <li>• Urticaria with or without itching</li> <li>• Localized edema</li> <li>• Flushing</li> </ul>
<b>Anaphylactic Reaction</b>	<ul style="list-style-type: none"> <li>• May occur in patients with IgA deficiency who have anti-IgA antibodies, causing severe to life-threatening immune response</li> <li>• Onset: Immediately or within 24 hours of transfusion</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of fever</li> <li>• Hypotension</li> <li>• Stridor</li> <li>• Bronchospasm</li> <li>• Dyspnea</li> <li>• Cramps</li> <li>• Flushing</li> <li>• Chest tightness</li> <li>• Hypoxemia</li> </ul>
<b>Acute Hemolytic Reaction</b>	<ul style="list-style-type: none"> <li>• Life-threatening complement-mediated immune reaction</li> <li>• Rapid hemolysis can cause simultaneous intravascular coagulation and hemolysis, renal failure, shock, and Disseminated Intravascular Coagulation (DIC)</li> <li>• Onset: within minutes to 24 hours of transfusion</li> </ul>	<ul style="list-style-type: none"> <li>• Fevers/chills</li> <li>• Flank pain</li> <li>• Reddish or brown urine</li> <li>• Dyspnea</li> <li>• Basilar crackles in lungs</li> <li>• Tachycardia</li> <li>• Hypotension</li> <li>• Cardiopulmonary arrest</li> <li>• Death</li> </ul>
<b>TRALI</b> (Transfusion Related Acute Lung Injury)	<ul style="list-style-type: none"> <li>• Non-cardiogenic pulmonary edema related to transfusion</li> <li>• Most commonly due to transfused antibodies that react with donor leukocytes, leading to leakage in the pulmonary vasculature</li> <li>• Onset within 6 hours of transfusion</li> <li>• Can be life threatening</li> </ul>	<ul style="list-style-type: none"> <li>• Respiratory distress</li> <li>• Hypoxemia</li> <li>• Fever</li> <li>• Tachycardia</li> <li>• Hypotension</li> </ul>



# THE REGIONAL EMERGENCY MEDICAL SERVICES COUNCIL OF NEW YORK CITY

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

TYPE OF REACTION	PATHOPHYSIOLOGY	SIGNS AND SYMPTOMS
<b>TACO</b> (Transfusion Associated Circulatory Overload)	<ul style="list-style-type: none"><li>• Cardiogenic pulmonary edema due to relative fluid overload<ul style="list-style-type: none"><li>• Large volume infused compared to fluid loss</li><li>• Impaired cardiac function</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Dyspnea</li><li>• Hypoxemia</li><li>• Chest pain</li></ul>
<b>Sepsis</b>	<ul style="list-style-type: none"><li>• Bacterial contamination of blood products</li><li>• Onset: Immediately or within 24 hours of transfusion</li></ul>	<ul style="list-style-type: none"><li>• Fever</li><li>• Chills</li><li>• Rigors</li><li>• Hypotension</li><li>• Tachycardia</li></ul>

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# THE REGIONAL EMERGENCY MEDICAL SERVICES COUNCIL OF NEW YORK CITY

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

### APPENDIX B:

### DESIGNATED NYC BLOOD BANKS

<b>Hospital Number</b>	<b>Name</b>
	New York Blood Center 45-01 Vernon Blvd Long Island City, NY 11101
2	Bellevue Hospital Center
7	Harlem Hospital Center
25	Jacobi Medical Center
27	Lincoln Medical and Mental Health Center
32	Elmhurst Hospital Center
48	Kings County Hospital Center
62	Staten Island University Hospital – Ocean Breeze Campus (North)

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**C.**

**KETAMINE INFUSION DRIP RATES**

**Ketamine drip rates for dial flow or IV pump**

DOSE (mg/kg/hr)	WEIGHT (kg)			
	40	60	80	100
	INFUSION (ml/hr)			
1	20	30	40	50
2	40	60	80	100
3	60	90	120	150
4	80	120	160	200

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**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX D:**

**MECHANICAL VENTILATOR**

1. Patients may be placed on the ventilator as available and as indicated for the management of patients who are > 8 years old with acute or chronic respiratory distress and/or failure who meet the following criteria:
  - a. Patients in respiratory distress who do not have any of the exclusion criteria as listed in REMAC Appendix P: Use of the Continuous Positive Airway Pressure (CPAP) Device; the patients may be placed on the Non-Invasive Positive Pressure Ventilation (NPPV)
  - b. Patients in acute respiratory failure who require advanced airway management using endotracheal intubation EXCEPT for those patients actively undergoing resuscitation with chest compressions
  - c. Patients who are currently ventilator dependent
2. Any adjustments to the initial ventilator settings, with the exception of FiO<sub>2</sub>, for patients utilizing NPPV or mechanical ventilation must be discussed with the OMA Response Physician
3. For patients who are currently ventilator-dependent, initial ventilator settings must be discussed with the OMA Response Physician
4. For patients in acute respiratory failure and who required advanced airway management; initial ventilator settings shall be set according to the Rescue Paramedic Ventilator Settings Guide as follows:

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

<b>BI-LEVEL (CPAP + PS)</b>	
Mode	CPAP - NPPV
Breaths Per Minute (BPM)	---
I:E Ratio	---
Tidal Volume ( $V_t$ )	---
PEEP (cm H <sub>2</sub> O)	5
Pressure Support (cm H <sub>2</sub> O)	10 - 20
FiO <sub>2</sub>	40 - 100%

<b>LUNG PROTECTIVE</b>	
Mode	AC (V)
Breaths Per Minute (BPM)	16 - 18
I:E Ratio	1:2.5
Tidal Volume ( $V_t$ )	4 - 6 ml/kg
PEEP (cm H <sub>2</sub> O)	5 - 10
Pressure Support (cm H <sub>2</sub> O)	---
FiO <sub>2</sub>	40-100%

<b>OBSTRUCTIVE / REACTIVE</b>	
Mode	AC (V)
Breaths Per Minute (BPM)	10 - 12
I:E Ratio	1:4 - 1:5
Tidal Volume ( $V_t$ )	6 - 8 ml/kg
PEEP (cm H <sub>2</sub> O)	0 - 5
Pressure Support (cm H <sub>2</sub> O)	---
FiO <sub>2</sub>	40 - 100%

**Peak Inspiratory Pressure (PIP) must be < 35 cm H<sub>2</sub>O**

# THE REGIONAL EMERGENCY MEDICAL SERVICES COUNCIL OF NEW YORK CITY

## ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

Height (ft, in)	IBW (kg)	*V <sub>t</sub> (ml) (4 ml/kg)	*V <sub>t</sub> (ml) (6 ml/kg)	*V <sub>t</sub> (ml) (8 ml/kg)
5'	50.0	200	300	400
5'1"	52.3	210	310	420
5'2"	54.6	220	330	440
5'3"	56.9	230	340	460
5'4"	59.2	240	360	470
5'5"	61.5	250	370	490
5'6"	63.8	260	380	510
5'7"	66.1	260	400	530
5'8"	68.4	270	410	550
5'9"	70.7	280	420	570
5'10"	73.0	290	440	580
5'11"	75.3	300	450	600
6'	77.6	310	470	620
6'1"	79.9	320	480	640
6'2"	82.2	330	490	660
6'3"	84.5	340	510	680
6'4"	86.8	350	520	690
6'5"	89.1	360	540	710

$$\text{IBW (kg)} = 50 + 2.3 * (\text{height in inches over } 5')$$

\*V<sub>t</sub> rounded to the nearest 10 ml

Tidal Volume (V<sub>t</sub>) Settings: Male

Height (ft, in)	IBW (kg)	*V <sub>t</sub> (ml) (4 ml/kg)	*V <sub>t</sub> (ml) (6 ml/kg)	*V <sub>t</sub> (ml) (8 ml/kg)
5'	45.5	180	270	360
5'1"	47.8	190	290	380
5'2"	50.1	200	300	400
5'3"	52.4	210	310	420
5'4"	54.7	220	330	440
5'5"	57	230	340	460
5'6"	59.3	240	360	470
5'7"	61.6	250	370	490
5'8"	63.9	260	380	510
5'9"	66.2	270	400	530
5'10"	68.5	270	410	550
5'11"	70.8	280	430	570
6'	73.1	290	440	580
6'1"	75.4	300	450	600
6'2"	77.7	310	470	620
6'3"	80	320	480	640
6'4"	82.3	330	490	660
6'5"	84.6	340	510	680

$$\text{IBW (kg)} = 45.5 + 2.3 * (\text{height in inches over } 5')$$

\*V<sub>t</sub> rounded to the nearest 10 ml

Tidal Volume (V<sub>t</sub>) Settings: Female

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX E:**

**CRICOTHYROTOMY**

This is a procedure of last resort for airway management of patients > 8 years old when all other maneuvers have failed or as clinically appropriate

1. Immobilize the larynx and palpate the cricothyroid membrane
2. Make a 3-5 cm incision vertically midline through the skin overlying the cricothyroid membrane
3. Stabilize the larynx and make a 1 cm incision horizontally through the cricothyroid membrane carefully to avoid injury of the posterior wall of the trachea
4. Once the incision is made, ensure patency and stabilize the opening with a tracheal hook
5. Insert the endotracheal tube and advance into the trachea toward the lungs
6. Remove the tracheal hook
7. Inflate the cuff of the tube as indicated
8. Attach the endotracheal tube to a bag valve device and confirm placement with capnography as conditions permit
9. Secure the endotracheal tube

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX F:**

**PERIPHERAL NERVE BLOCKS**

**OMA RESPONSE PHYSICIAN PROCEDURE**

Facilitate procedure and identification of landmarks with use of ultrasound as available

**NOTE:** Aspirate prior to injection of anesthetic solution to ensure that the needle is not intravascular

**ADULT/PEDIATRIC:**

**Local**

1. Infiltrate the desired area with 2% Lidocaine while withdrawing the needle and slowly inject solution
2. Perform subsequent injections in a triangular geometric pattern to ensure an adequate block. Should deeper tissue levels require anesthetizing, utilize a similar approach

**Hematoma Fracture Block**

1. Inject 2% Lidocaine 5-10 ml into fractured area and around fractured bone

**NOTE:** Aspirate will have blood mixed with fat/marrow, but should not be bright red or pulsatile

Larger fractures may require larger volume of lidocaine

Do not attempt in open fractures

**Digital Block**

1. Infiltrate the dorsal aspect of the digit at the level of the metacarpal/metatarsal head
2. While advancing the needle in the palmar/plantar direction, inject 2% Lidocaine 1-2 ml on each side of the digit



**Wrist Block: Radial Nerve**

1. Extend the thumb against resistance, revealing the area just above the styloid process of the radius (“anatomical snuff box”)
2. Infiltrate the area of the tendon of extensor pollicis longus over the styloid process of the radius. Direct the needle across the dorsum of the wrist towards the ulnar border
3. Inject 2% Lidocaine 5-7 ml SQ as the needle is advanced
4. Withdraw the needle to the insertion point and redirect the tip across the tendon of the flexor pollicis brevis and additionally inject 2% Lidocaine 2-3 ml SQ

**Wrist Block: Ulnar Nerve**

1. Infiltrate the area just lateral to the flexor carpi ulnaris tendon and medial to the ulnar artery (ulnar artery can be palpated with the wrist in flexion)
2. Slowly inject 2% Lidocaine up to 5 ml SQ at approximately 1-1.5 cm in depth
3. Withdraw the needle to the insertion point and redirect the tip laterally around the ulnar aspect of the flexor carpi ulnaris and additionally inject 2% Lidocaine 5 ml SQ

**Ankle Block: Tibial Nerve**

1. Rotate the leg laterally to gain access to the medial posterior aspect of the foot
2. Locate the tibial nerve which lies posterior and lateral to the tibial artery
3. Infiltrate the needle towards the artery, anterior to the Achilles tendon and posterior to the medial malleolus, and inject 2% Lidocaine 5 ml SQ in a fan-like manner while withdrawing the needle

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX G:**

**LIMB AMPUTATION**

**OMA RESPONSE PHYSICIAN PROCEDURE**

This is a procedure of last resort, given the situation, conservative management should be considered

**ADULT/PEDIATRIC:**

1. Once the decision has been made to perform a field limb amputation, if possible, inform patient and other support personnel in the immediate area
2. Check all equipment, including electrical and non-electrical amputation tools
3. Identify the level of amputation, keeping in mind that the length of the extremity should be maximally preserved
4. If possible, apply two (2) tourniquets:
  - a. Proximal tourniquet: place a loose tourniquet proximally to the amputation site that will be tightened as needed for hemorrhage control
  - b. Distal tourniquet: place as far distally as possible, but proximal to the amputation site. Tighten the tourniquet and record the time on the tourniquet

**NOTE:** Do not place tourniquets over a joint

5. With a scalpel, make a circumferential incision and extend it AWAY from the provider. Incise as much of the soft tissue as possible to bone level
6. Horizontal traction should be used to stabilize the extremity, as needed
7. Bone incision should be made with a wire saw or other appropriate tool (e.g. reciprocating saw, hand saw) until the bone is completely cut
8. Use Mayo scissors to cut any remaining soft tissue
9. Tighten the proximal tourniquet as needed for any persistent bleeding
10. Apply hemostatic dressing to the cut surface of the bone

**NOTE:** Be careful not to touch the cut end of the bone as the surface may be sharp

11. Place additional gauze/abdominal pad over the cut surface
12. Wrap the extremity using roller gauze and self-adhesive elastic bandage
13. If you are able to retrieve the amputated limb, place sterile, saline soaked gauze over the end and secure with an elastic bandage. Place the amputated limb in a clean bag and transport to the hospital with the patient. Do NOT place the amputated limb on ice

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX H:  
ESCHAROTOMY**

**OMA RESPONSE PHYSICIAN PROCEDURE**

This is a procedure of last resort, given the situation, conservative management should be considered

**ADULT/PEDIATRIC:**

1. Consider administering local anesthesia, such as 2% Lidocaine 5 ml SQ, as needed in areas where escharotomy incisions are to be extended into unaffected skin
2. Perform full thickness incision using scalpel or electrocautery into subcutaneous fat sufficiently to see obvious separation of wound edges
  - a. Limbs: Incisions should involve releasing both medial and lateral sides along mid axillary lines
  - b. Chest: Incisions should be made along the mid axillary lines continuing over the abdominal wall if the burn extends to the abdomen. Transverse elliptical incisions below the clavicle and across the abdomen below the costal margin can be made to join the vertical incisions to allow for adequate release
3. Palpate along incision to detect any residual restrictive constrictions and release as needed

**NOTE:** Where possible, incisions shall start and finish at least 1 cm on to unburned and healthy tissue

4. Dress wounds with burn dressings as available

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX I:**

**FASCIOTOMY**

**OMA RESPONSE PHYSICIAN PROCEDURE**

This is a procedure of last resort, given the situation, conservative management should be considered

Extremity shall be splinted in a stable and functional position post procedure

Leave wounds open and cover with gauze moistened with saline and wrap with a loose bandage

**ADULT/PEDIATRIC:**

**UPPER EXTREMITY**

**Shoulder/Brachium**

1. Shoulder: Make anterior and posterior incisions along the deltoid muscle to release the shoulder compartment
2. Brachium: Make a medial incision just above the medial intermuscular septum. From this incision, the anterior and posterior compartments may be decompressed by dissecting the fascia of the biceps and triceps

**Forearm**

1. Volar release: Make a gentle S-shaped incision on the volar side of the forearm by starting 1 cm proximal to the medial condyle and curving medially to reach the forearm midline at the junction of the middle and distal third of the forearm. Identify underlying fascia and release
2. Dorsal release: Make longitudinal incision beginning 3-4 cm distal to the lateral epicondyle and toward the Lister tubercle. Identify underlying fascia and release

**Hand**

1. Interosseous and adductor: Make an incision along the dorsal side of the index metacarpal bone and dissect along either side of the metacarpal bone to access the fascia of the first and second dorsal interosseous, the adductor policis and the first palmar interosseous muscles
2. Make a second dorsal incision over the fourth metacarpal bone to provide access to the third and fourth dorsal interosseous muscles and second and third palmar interosseous muscles
3. Thenar decompression: Make a longitudinal incision along the radial side of the thumb metacarpal bone
4. Hypothenar decompression: Make a longitudinal incision along the ulnar aspect of the fifth finger metacarpal bone

## LOWER EXTREMITY

### Lower Leg: Anterior/Lateral Compartments:

1. Make the lateral incision between 12-20 cm in length centered between the fibular shaft and the crest of the tibia
2. To release the anterior compartment, make an incision parallel to the tibial crest approximately 2.5 cm lateral to the tibial crest. The fascial incision should be the length of the skin incision
3. To release the lateral compartment, identify the intermuscular septum approximately half way between the fibula and the anterior crest. Posterior to this septum, incise the fascia from the proximal aspect to the distal third of the foreleg

### Lower Leg: Posterior Compartment:

1. The superficial posterior compartment is decompressed by making an incision at the posteromedial aspect of the leg from the proximal gastrocnemius to the distal third of the foreleg
2. The deep posterior compartment is decompressed by dividing the attachments of the soleus muscle to the tibia

### Thigh

1. Make a lateral incision originating from a point just distal to the intertrochanteric line and extend to the lateral epicondyle of the femur
2. The iliotibial band and fascia of the vastus lateralis are incised the full length of the skin incision to decompress the anterior compartment
3. The posterior compartment is decompressed by reflecting the vastus lateralis muscle medially to expose the lateral intermuscular septum, which is then incised the length of the skin incision
4. If required, a second incision overlying the adductor muscle group is used for medial thigh compartment decompression

### Foot

1. Make two dorsal longitudinal incisions that are positioned medial to the second metatarsal bone and lateral to the fourth metatarsal bone. Each of the interosseous compartments may be accessed between the metatarsal bones as well as the lateral compartment through the lateral dorsal incision
2. The calcaneal compartment underlying the metatarsals may be opened directly
3. The medial compartment may be accessed through an incision along the medial foot, immediately posterior to the first metatarsal

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX J:**

**SUPRAPUBIC NEEDLE CYSTOSTOMY**

**OMA RESPONSE PHYSICIAN PROCEDURE**

Facilitate procedure and identification of landmarks with use of ultrasound as available

**ADULT/PEDIATRIC:**

1. Anesthetize insertion site midline 2 cm above the symphysis pubis with 2% Lidocaine 2 ml SQ as available
2. Slowly insert a large bore IV cannula with an attached syringe. Keeping the needle perpendicular to the skin surface, slowly retract the syringe while inserting the needle until urine is aspirated
3. Remove syringe and needle, leaving the catheter in place
4. Attach IV tubing to catheter and drain urine into container
5. After urine flow ceases, clamp tubing and secure catheter in place
6. Unclamp tubing and drain bladder every 3-6 hours or as needed

**ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS**

**APPENDIX K:**

**LATERAL CANTHOTOMY**

**OMA RESPONSE PHYSICIAN PROCEDURE**

**ADULT/PEDIATRIC:**

1. Anesthetize the lateral canthus with 2% Lidocaine 1-2 ml SQ as available
2. Clamp a straight hemostat horizontally at the lateral canthus for one minute for hemostasis
3. With blunt-tipped scissors, incise approximately 1 cm through the lateral canthus horizontally
4. Grasp the lower lid at the inferior edge of the incision, and in a supine patient, provide upward traction away from the patient
5. Identify the lateral canthal tendon, and with the tips of the scissors pointed inferiorly, cut the tendon 1-2 cm to complete inferior cantholysis
6. Assess success of the procedure by the following findings:
  - a. Lid margin, once released, should move medially to the temporal limbus
  - b. Eyelid should be freed from the globe
  - c. If these objectives are not accomplished, incise more deeply
7. Provide hemostasis by direct compression of the wound at the orbital rim
8. Cover and protect eye with shield and dressings