

THE REGIONAL EMERGENCY MEDICAL SERVICES COUNCIL OF NEW YORK CITY

ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

These General operating Procedures Apply ONLY to FDNY Rescue Paramedics

Purpose

To establish protocols defining the scope of added New York City Fire Department's Advanced Emergency Medical Technician - Paramedic (AEMT-P) Rescue units operating in the prehospital 911 system.

Scope

The New York City Fire Department has extensively trained a limited number of AEMT-Ps to perform Prehospital Advanced Emergency Medical Care during the Rescue/Recovery of entrapped victims. The Fire Department has established specific protocols, contained herein, that shall be used exclusively by these Paramedics when assigned to a rescue unit and under the direction of an FDNY Office of Medical Affairs (OMA) Physician. These protocols are guidelines that should be used in conjunction with on-scene blood chemistry analysis as well as good clinical judgment, and they are intended to be utilized in conjunction with existing New York City REMAC Protocols.

NOTE: UNDER NO CIRCUMSTANCES MAY RESCUE PARAMEDICS PROVIDE TREATMENT USING DISCRETIONARY PROTOCOLS WITHOUT CONTACTING AND RECEIVING PRIOR DIRECTION FROM AN FDNY OMA PHYSICIAN.

Training

All Rescue Paramedics have met New York State Department of Health Bureau of Emergency Medical Services and Regional Emergency Medical Services Committee (REMAC) of New York City. The rescue AEMT-Ps are FDNY HazMat Technicians who have been certified by the New York State Office of Fire Prevention and Control through the FDNY Fire Academy – Technical Rescue School in confined space rescue, structural collapse rescue, trench rescue and high angle rope rescue techniques. The Rescue AEMT-Ps have also received advanced training in the medical management of Crush Syndrome, Compartment Syndrome and other unique medical and surgical problems encountered during a technical rescue situation. Additionally these individuals are credentialed in the use of specialized medical equipment. Training records are maintained at the FDNY HazTac headquarters.

SPECIAL MEDICAL EQUIPMENT AND MEDICATIONS:

(This is in addition to general ALS medications and equipment.)

<u>Equipment</u>	<u>Medications / Solutions</u>
Temperature Probes (oral and rectal)	3% Saline
RAD 57 Monitor	D5W
AirTrak or Glidescope (or equivalent device)	D5W ½ Normal Saline
Foley Catheters (adult and pediatric)	Calcium Gluconate
i-STAT and Cartridges	Hemostatic Dressings
IV Warmer	Fentanyl
King Airway	Insulin
Mechanical Advantage Tourniquet (MAT)	Mannitol
Quick-Trach	Sodium Bicarbonate 4.2%
Portable Ventilator	Succinylcholine
	Vecuronium

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FDNY Rescue Paramedics Protocols

These protocols are designed for used specifically by FDNY EMS Paramedics that have been trained and credentialed to the level of "Rescue Medic". Any treatment beyond standing orders requires direction from an FDNY OMA Physician.

Initial Management

1. Begin Basic Life Support Procedures
2. Protect Patients airway from particulates using any of the following:
 - a. N95 mask
 - b. P 100 mask
 - c. Non rebreather O₂ mask
 - d. Face shield
 - e. SCBA:
 - i. For patients who are Members of Service (any agency if fit tested)
 - ii. As a loose fitting protective device with free flow air
3. Begin pulse oximetry monitoring
4. Perform Endotracheal Intubation, if necessary.
 - a. Endotracheal intubation must be performed utilizing direct in-line stabilization when appropriate.
 - b. In the spontaneously breathing patient with an intact gag reflex:
 - i. Administer etomidate 0.3mg/kg, IV or Saline Lock bolus (maximum dose 20mg)
 - ii. In the event of suspected head trauma, administer lidocaine 1.5mg/kg, IV or Saline Lock bolus.
 - iii. Intubate using endotracheal tube via direct or video/fiberoptic laryngoscopy or wire guided retrograde intubation technique.
 - iv. Administer diazepam 5mg, IV or Saline Lock bolus, for continued sedation after successful endotracheal intubation.
 - v. If unable to obtain endotracheal intubation following the aforementioned techniques, alternative airway measures (Combitube or King Airway) may be utilized.
 - vi. If adequate airway management cannot be achieved by any other means, and patient is non-responsive, utilize the Quick-Trach to perform cricothyrotomy.
5. If Basic Life Support measures fail to control bleeding, a "Hemostatic Agent" shall be used to assist with bleeding control.
6. Begin Cardiac Monitoring. Record and interpret a baseline 12 lead ECG as soon as possible.
7. Establish IV 0.9% Normal Saline using, if possible, a large bore (14-18gauge) catheter and begin infusion of 0.9% Normal Saline.
 - a. For signs and symptoms of hypovolemic shock, administer 1L bolus of 0.9% NS.
 - b. In the absence of signs of hypovolemia, administer 2cc/kg/hr of 0.9% NS.
8. If unable to obtain IV access, establish an IO (if indicated) and begin infusion of 0.9% Normal Saline.

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- a. Use of intraosseus access shall be limited to the extremities and only attempted after traditional methods of intravenous access have been unsuccessful.
9. Monitor patient for hypothermia or hyperthermia. Obtain core temperature measurement. Provide necessary treatment as per sub-protocols.
10. Do not allow patient to eat or drink anything.
11. Draw blood sample and analyze blood chemistry using i-STAT, if possible. Continue analyzing PRN.

ONSCENE OMA PHYSICIAN MEDICAL CONTROL OPTIONS

- Option A:** If intubation unsuccessful due to jaw clenching despite facilitation with etomidate, consider inducing paralysis by administering succinylcholine 1mg/kg, IV or Saline Lock bolus. Vecuronium bromide 0.1mg/kg, IV or Saline Lock bolus, may be substituted for succinylcholine if hyperkalemia and/or crush syndrome is suspected.
- Option B:** Repeat diazepam 5-10mg IV every 20 minutes for prolonged onscene operations.
- Option C:** Pain control should be utilized as necessary with on hand medications.
- a. Morphine
 - i. Initial dose of 0.1mg/kg, IV or Saline Lock bolus (maximum dose 5mg).
 - ii. May provide two additional doses of 0.05mg/kg, IV or Saline Lock bolus, (maximum dose 2.5mg) every 5 minutes (maximum cumulative dose 10mg).
 - iii. For prolonged on-scene operations, may be repeat doses of 0.05mg (maximum 2.5mg) every 20 minutes, as needed at the discretion of the FDNY OMA Physician.
 - b. Fentanyl
 - i. Initial dose of 1mcg/kg, IV or Saline Lock bolus (maximum dose 50mcg).
 - ii. May provide two additional doses of 0.5mcg/kg, IV or Saline Lock bolus (maximum dose 25mcg) every 5 minutes (maximum cumulative dose 100mcg).
 - iii. For prolonged on-scene operations, may be repeat doses of 0.5mg (maximum 25mcg) every 20 minutes, as needed at the discretion of the FDNY OMA Physician.

NOTE: THE USE OF A PARALYTIC AGENT IS ONLY ALLOWED WHEN DIRECTED BY AN FDNY OMA PHYSICIAN AND WHEN WAVEFORM CAPNOGRAPHY IS AVAILABLE FOR CONTINUOUS AIRWAY MONITORING.

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Sub-Protocols

A: CRUSH SYNDROME

B: HYPERKALEMIA

C: HYPONATREMIA

D: HYPERTHERMIA

E: HYPOTHERMIA

F: BURNS

G: SEVERE UNCONTROLLED EXTREMITY HEMORRHAGE

H: LIMB AMPUTATION

ADVANCED EMERGENCY MEDICAL TECHNICIAN (PARAMEDIC) PROTOCOLS

A

CRUSH SYNDROME

Consider that the patient may be in the early stages of Crush Syndrome if the patient remains trapped for a period greater than 1 hour or is presenting with signs and symptoms of Crush Syndrome.

ADULT:

1. Perform Initial Management Protocol
2. Infuse 0.9% Normal Saline or D5W ½ Normal Saline as directed.
3. When possible, obtain urine and test for the presence of hemoglobin / myoglobin. If necessary, insert a foley catheter.
4. Administer IV fluids to correct volume deficit:
 - a. Administer 1L 0.9% NS bolus.
 - b. Administer sodium bicarbonate 44mEq, IV or Saline Lock bolus.
 - c. Mix sodium bicarbonate 88mEq in 1L D5W and administer at a rate of 1L per hour.

ONSCENE OMA PHYSICIAN MEDICAL CONTROL OPTIONS

- Option A:** If the patient is showing early signs of renal failure/insufficiency including "hematuria"/myoglobinuria and has **documented urine output**,
- i. Administer Mannitol^{1,3} 1.5-2.0 g/kg in 1000 cc of D5W ½ Normal Saline to be infused at a rate of 500 cc per hour
 - ii. Lasix 40-80 mg, IV or Saline Lock bolus.

NOTE: ANURIC PATIENTS MAY NOT BE GIVEN MANNITOL.

- Option B:** For extended operations, foley insertion may be required to monitor urinary output and for BBP precautions. Maintain urinary output of 300 cc per hour and a pH ≥7.65.
- Option C:** Obtain serum glucose level with the i-STAT or glucometer.
- Option D:** For patients with i-STAT values or EKG findings consistent with hyperkalemia:
- i. Administer 25 gms of D50 and 10 units of regular Insulin, IV or Saline Lock bolus.
 - ii. Administer Albuterol 10mg via nebulizer or in-line administration device.
 - iii. Administer Calcium Gluconate 1g (10 cc of a 10% solution), IV or Saline Lock bolus, over 2 minutes.

PEDIATRIC:

1. Perform Initial Management Protocol
2. Infuse 0.9% Normal Saline or D5W ½ Normal Saline as directed.

¹ Intravenous infusion: if benefits are not observed after administering 200 grams, mannitol should be discontinued.

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3. Obtain urine and test for the presence of myoglobin. If necessary insert a foley catheter.
4. Administer IV fluids to correct volume deficit (2cc/kg) and ensure renal function and minimize the potential clinical consequences of Acute Renal Failure.
 - a. Administer 20cc/kg of 0.9% NS bolus
 - b. Administer 4.2% sodium bicarbonate 1mEq/kg (maximum 44mEq), IV or Saline Lock bolus.
 - c. Mix 8.4% sodium bicarbonate 88mEq in 1L D5W and administer as follows:
 - i. <10kg: 8cc/kg/hr
 - j. 10-20kg: 80cc/hr + 4cc/kg/hr
 - k. >20kg: 160cc/hr + 2cc/kg/hr

ONSCENE OMA PHYSICIAN MEDICAL CONTROL OPTIONS

- Option A:** If the patient is showing early signs of renal failure/insufficiency including "hematuria"/myoglobinuria and has **documented urine output**:
- i. Administer Mannitol^{1,3} 0.5-1 g/kg (maximum dose 12.5g) in 250 cc of D5W ½ Normal Saline to be infused at a rate of 125 cc per hour
 - ii. Lasix 1-2 mg/kg, IV or Saline Lock bolus.

NOTE: ANURIC PATIENTS MAY NOT BE GIVEN MANNITOL.

- Option B:** For extended operations, foley insertion may be required to monitor urinary output and for BBP precautions. Maintain urinary output of 3cc/kg per hour and a pH ≥ 7.65 .²
- Option C:** Obtain serum glucose level with the i-STAT or glucometer.
- Option D:** For patients with EKG findings consistent with hyperkalemia:
 - i. Administer D25 0.5g/kg (infants D10 5cc/kg) and regular Insulin 0.1units/kg, IV or Saline Lock bolus.
 - ii. Administer Albuterol 10mg via nebulizer or in-line administration device.
- Option E:** Administer Calcium Gluconate 200-500 mg (infants: not more than 200 mg), IV or Saline Lock bolus, over 2 minutes.

² Foley insertion may be required to monitor urinary output and for BBP precautions. This option should be considered for extended operations.

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B

HYPERKALEMIA

ADULT:

1. Perform Initial Management Protocol
2. Administer 44 mEq of Sodium Bicarbonate, IV or Saline Lock bolus.

ONSCENE OMA PHYSICIAN MEDICAL CONTROL OPTIONS

Option A: Administer 10 cc of 10% IV solution over 2 min Calcium Gluconate or 10cc of 10% IV solution of Calcium Chloride, IV or Saline Lock bolus, slowly over 2 min.

NOTE: DISCONTINUE CALCIUM ADMINISTRATION IF SEVERE BRADYCARDIA DEVELOPS.

Option B: Obtain serum glucose level with the i-STAT or glucometer.

Option C: Administer 25 gms D50 and 10 units of regular Insulin, IV or Saline Lock bolus.

Option D: Administer Albuterol 10mg via nebulizer or in-line administration device.

Option E: Lasix 40-80 mg, IV or Saline Lock bolus.

PEDIATRIC:

1. Perform Initial Management Protocol
2. Administer Sodium Bicarbonate IV bolus.
 - a. Infants: 0.5 mEq / kg IV over 5-10 min; repeat in 10 min prn (only use 4.2% solution.
 - b. Children: 1-2 mEq/kg IV over 5-10 min; repeat in 10 min prn.

ONSCENE OMA PHYSICIAN MEDICAL CONTROL OPTIONS

Option A: Administer Calcium Gluconate 200-500 mg (infants: not more than 200 mg), IV or Saline Lock bolus, over 2 minutes.

NOTE: DISCONTINUE CALCIUM ADMINISTRATION IF SEVERE BRADYCARDIA DEVELOPS.

Option B: Obtain serum glucose level with the i-STAT or glucometer.

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- Option C:** Administer D25 0.5g/kg (infants D10 5cc/kg) and regular Insulin 0.1units/kg, IV or Saline Lock bolus.
- Option D:** Administer Albuterol 10mg via nebulizer or in-line administration device.
- Option E:** Lasix 1-2 mg/kg, IV or Saline Lock bolus.

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C

HYPONATREMIA

ADULT:

1. Perform Initial Management Protocol

ONSCENE OMA PHYSICIAN MEDICAL CONTROL OPTIONS

Option A: For the management of patients with documented hyponatremia (<120mEq/dL) and altered neurologic status / seizures, administer 3% saline IV drip at a rate to deliver 100 ml/hr, to raise sodium level to 120 mEq/dL.

PEDIATRIC:

1. Perform Initial Management Protocol

ONSCENE OMA PHYSICIAN MEDICAL CONTROL OPTIONS

Option A: For the management of patients with documented hyponatremia (<120mEq/dL) and altered neurologic status / seizures, administer 3% saline IV slow push until seizures are terminated at a rate to deliver 4cc/kg (assess response and repeat if needed).

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D

HYPERTHERMIA

ADULT:

1. Perform Initial Management Protocol
2. Cool the patient at a rate of at least 0.2°C/min (0.36°F/min) to a core temperature of 39°C (102.2°F). This can be done by wrapping the patient in sheets wetted in cold water or placing ice packs in the axillary region and the groin.
3. Administer intravenous fluids as per 'Initial Management' standing orders.

PEDIATRIC:

1. Perform Initial Management Protocol
2. Cool the patient at a rate of at least 0.2°C/min (0.36°F/min) to a core temperature of 39°C (102.2°F). This can be done by wrapping the patient in sheets wetted in cold water or placing ice packs in the axillary region and the groin.
3. Use intravenous fluid resuscitation only to treat hypovolemia.
4. If the patient presents with a fluid related heat exhaustion, infuse 20-40cc/kg of Normal Saline in the first hour, monitoring electrolytes and fluid administration vs. output and respiratory status.

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E

HYPOTHERMIA

ADULT:

1. Perform Initial Management Protocol
2. Re-warm (decrease/control heat loss) the patient using blankets and heat packs placed in the axillary region, the groin and on the abdomen.
3. Administer IV fluids heated to 45⁰C/113⁰F titrated to a rate to increase measurable temperature by 0.3 to 1.2⁰C per hour.

PEDIATRIC:

1. Perform Initial Management Protocol
2. Re-warm (decrease/control heat loss) the patient using blankets and heat packs placed in the axillary region, the groin and on the abdomen.
3. Administer 0.9% Normal Saline IV fluids at a rate of 20cc/kg heated to 45⁰C/113⁰F titrated to a rate to increase measurable temperature by 0.3 to 1.2⁰C per hour

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F

BURNS

ADULT/PEDIATRIC:

1. Perform Initial Management Protocol
2. Provide morphine or fentanyl for pain management as per Initial Management protocol.
3. Initiate the following fluid resuscitation for any patient with second or third degree burns whose involved body surface area exceeds 20%.
 - a. Using the Parkland Formula ($4 \text{ ml} \times \text{weight in Kg} \times \% \text{ of BSA}$) as a guideline, infuse half the amount at a drip rate to deliver the desired dose over a period of 8 hours from the time of the initial injury. Infuse the 2nd half at a rate to be delivered over 16 hours.
 - b. Additionally provide maintenance fluids as follows:
 - i. Adults: 125cc/hr
 - ii. Pediatrics
 1. <10kg: 4cc/kg/hr
 2. 10-20kg: 40cc +2cc/kg/hr
 3. >20kg: 60cc + 2cc/kg/hr (maximum 125cc/hr)

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G

SEVERE UNCONTROLLED EXTREMITY HEMORRHAGE

ADULT/PEDIATRIC:

1. Perform Initial Management Protocol
2. Apply Mechanical Advantage Tourniquet (MAT) to extremity by using the turnkey mechanism to desired pressure to control bleeding. Once the tourniquet is applied only the onscene physician may release it.
3. Apply hemostatic dressing.

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H

LIMB AMPUTATION

ADULT/PEDIATRIC:

1. OMA Physician may perform limb amputation as required.