



# NYC REMAC

Advisory No.	2010-01
Title:	Revisions / Updates to REMAC Prehospital Treatment & Transport Protocols
Issue Date:	January 1 <sup>st</sup> , 2010
Effective Date:	April 1 <sup>st</sup> , 2010
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The Regional Emergency Medical Advisory Committee (REMAC) of New York City has revised and updated the regional prehospital treatment and transport protocols. All protocols have been approved by the New York State Emergency Medical Advisory Committee for use in the NYC region.

A list of all revised protocols summarizing changes is attached, along with actual protocols identifying specific changes. New Language is **underlined and bold**. Deleted Language is **~~struck-out~~**.

Current and Updated Protocols can be accessed at the Regional EMS Council website:

[www.nycremsco.org](http://www.nycremsco.org).

**REMAC has changed its protocol implementation timetable so that revised protocols will be issued in January and allow several months for training of personnel prior to the **April 1<sup>st</sup>, 2010 effective date.****

Owners/operators of Ambulance and ALS First Response Services providing prehospital medical treatment within the five boroughs of the City of New York are responsible to provide copies of the NYC REMAC Prehospital Treatment Protocols to their personnel, and to ensure that Service Medical Directors and EMS personnel are informed of all changes/updates to the NYC REMAC Prehospital Treatment Protocols.

**In order to provide evidence that all EMS personnel have been updated in current protocols, the EMS Agency must provide a list of updated personnel accompanied by a letter of affirmation signed by the service medical director and Chief Executive Officer no later than FOUR (4) weeks after completion of training/in-service.**

Lewis W. Marshall, Jr., MD, JD  
Chair, Regional Emergency Medical Advisory Committee of New York City

## General Operating Procedures

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- Oxygen Administration – Removal of treatment based purely on respiratory rate. Removal of mouth – to – mouth or mouth –to – nose rescue breathing
- Initiating Transport – Modified to address the need for protocol-specific prioritization of transport versus ALS care.
- Communications with Medical Control Facilities – Removal of 20 minute rule for OLMC contact. *[Agencies should develop and implement their own operational policies regarding excessive on-scene time]*
- Prehospital Sedation – Addition of etomidate only for short-lived procedures. *[All uses of Etomidate for this purpose must be reported to REMAC for QA.]*

## BLS Protocols

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### 401 – Respiratory Distress / Failure

- Removal of treatment based purely on respiratory rate.

### 407 – Wheezing

- This change proposes to administer epi-pen to patients under 33 years old who are experiencing severe asthma or anaphylaxis, without prior permission of on line medical control, without having been prescribed an epi-pen by their personal physicians

### 410 – Anaphylactic Reaction

- This change proposes to administer epi-pen to patients under 33 years old who are experiencing severe asthma or anaphylaxis, without prior permission of on line medical control, without having been prescribed an epi-pen by their personal physicians

### 421 – Head and Spine Injuries

- Clarification of NEXUS criteria within selective immobilization section.

### 423 – Chest Injuries

- Removal of bulky dressing for treatment of flail segments.

### 425 – Bone and Joint Injuries

- Added note to reinforce concept for ALS assistance for pain management.
- Clarification that use of traction splint is for 'closed' femur fractures

### 428 – Burns

- Added note to reinforce concept for ALS assistance for pain management.
- Changed dressings from saline-moistened to dry for burns greater than 10% BSA.

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

## Revision/Update of REMAC Prehospital Treatment & Transport Protocols

### 430 – Emotionally Disturbed Patient

- Added note to reinforce concept for ALS assistance for sedation when necessary (i.e. violent patient).

### 431 – Heat-Related Emergencies

- Removal of recommendation that patient's drink normal saline.

## ALS Protocols

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### 500-A and 500-B – Smoke / Cyanide

- Clarification specific to the use of sodium thiosulfate.

### 502 – Obstructed Airway

- Added language to describe intended right main-stem displacement.
- Removal of needle Cricothyroidotomy. *[Rescue medic protocols retain this procedure.]*

### 503-A – Ventricular Fibrillation / Pulseless Ventricular Tachycardia

- Modification of recommendation for biphasic energies.

### 503-B – Pulseless Electrical Activity (PEA) / Asystole

- Addition of dextrose administration.

### 504 – Suspected Myocardial Infarction

- Note added to reinforce need for OLMC contact.
- Change to prioritize transport over IV initiation.

### 505-A – Supraventricular Tachycardia

- Modification of recommendation for biphasic energies.

### 505-B – Atrial Fibrillation/Atrial Flutter

- Modification of recommendation for biphasic energies.

### 505-C – Ventricular Tachycardia with a Pulse / Wide Complex Tachycardia of Uncertain Type

- Modification of recommendation for biphasic energies.

### 505-D – Bradydysrhythmias and Complete Heart Block

- Removal of epinephrine infusion.

### 506 – Acute Pulmonary Edema

- Modification placing furosemide into OLMC options rather than as standing order.

### 510 – Anaphylactic Reaction

- Removal of epinephrine infusion.

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

## *Revision/Update of REMAC Prehospital Treatment & Transport Protocols*

### 521- Head Injuries

- Addition of language to guide controlled hyperventilation in the case of increased intracranial pressure.

### 540 – Obstetric Complications

- Removal of oxytocin
- Rename protocol: Severe Pre-Eclampsia / Eclampsia

### 555 – Pediatric Anaphylactic Reaction

- Removal of epinephrine infusion.

### 551 – Pediatric Obstructed Airway

- Added language to describe intended right main-stem displacement.
- Removal of needle Cricothyroidotomy.

**REGIONAL EMERGENCY MEDICAL ADVISORY COMMITTEE**

**NEW YORK CITY**

**PREHOSPITAL TREATMENT PROTOCOLS**

# **GENERAL OPERATING PROCEDURES**

**July 2009**

Version 070109b

**Recommended Changes**

**Protocol Committee**

**October 9, 2009**

**Presented to:**

**Medical Standards – 10/20/09**

**REMAC – 10/20/09**

**REMAC approved version**

**10/20/2009**

**Public Notice: October 28, 2009**

**Approved by SEMAC December 2009**

## INTERPRETATION OF PROTOCOLS

The Advanced Life Support (Paramedic) Treatment Protocols are for the use of the AEMT-P in the field and the Medical Control physician. They have been developed to ensure high quality, standardized prehospital emergency medical care. The protocols are specific for Advanced Life Support treatment. Patient assessment and Basic Life Support treatment have not been enumerated herein. However, they are the foundation upon which these protocols are based, and are always to be performed as necessary. All references to Basic Life Support procedures refer to the appropriate Regional Emergency Medical Advisory Committee (REMAC) of New York City Basic Life Support Treatment Protocols.

~~Protocols 501 through 521, and 530 apply to adult patients 14 years of age and older. (For patients 14 years of age and older who weigh less than 40 kg, see the Pharmacology Table for appropriate drug dosages.) Protocols 527 through 529 apply to all patients. Protocols 540 through 559 apply to pediatric patients 13 years of age or younger.~~

## INITIATING TRANSPORT

When CFRs, EMTs and AEMT-Ps are on the scene of an assignment and requesting advanced life support, other medical assistance, or ambulance transport, patient transport procedures should begin in accordance with their level of training. For non-transporting EMS Agencies, ambulance transport should begin once an appropriate transport vehicle from the designated transporting agency is available.

When EMTs are on the scene of an assignment and requesting Advanced Life Support assistance, transport procedures should begin. If the time of arrival of Advanced Life Support exceeds the time to the hospital, transport from the scene should not be delayed unless otherwise specified in a particular protocol.

### **Rationale – Initiating Transport**

Given the number of protocols (particularly cardiac arrest) which require extensive on-scene treatment, this wording change is recommended merely to avoid the appearance of conflict.

## OXYGEN ADMINISTRATION

**NOTE: ALL PATIENTS WHO ARE IN RESPIRATORY ARREST MUST HAVE VENTILATORY ASSISTANCE UNLESS A VALID DNR ORDER EXISTS.**

**DO NOT USE A DEMAND VALVE RESUSCITATOR DUE TO THE POSSIBILITY OF CAUSING SEVERE, LIFE-THREATENING COMPLICATIONS.**

Adult patients who require supplemental oxygen should receive high concentration oxygen via a non-rebreathing mask set at 10 to 15 liters per minute. The reservoir bag must remain at least one-third full following inspiration. If a mask is not tolerated by the patient, a nasal cannula set at 6 liters per minute should be used and such use properly documented.

Patients who are chronically maintained on oxygen and do not require high concentration oxygen shall be administered oxygen at their prescribed rate of flow.

**NOTE: THERE IS NO REASON TO WITHHOLD HIGH CONCENTRATION OXYGEN WHEN REQUIRED IN ADULT PATIENTS.**

For Adult patients ~~breathing at a rate less than 8 or greater than 24 times per minute~~ with signs of on-going hypoxia, inability to adequately protect their airway, and/or exhibiting signs of inadequate respiration, assisted ventilations may be required. The presence of a valid DNR order does not alter this requirement for a patient who is not in respiratory or cardiac arrest. This should be done utilizing one of the following methods:

### Rationale – Oxygen Administration

In spite of the arbitrary numbers referred to in some curricula or texts, we recommend that our providers (of all certification levels) be taught and guided by protocols that recommend artificial ventilation when it is physiologically indicated, not based simply upon respiratory rate.

- Pocket mask with supplemental oxygen set at 10-15 liters/minute.
- Bag-Valve-Mask and reservoir with flow set at 10-15 liters/minute.
- ~~Mouth-to-mouth or mouth-to-mouth and nose (at provider option, only when adjuncts are not available).~~

Pediatric patients who require oxygen should receive high concentration oxygen via the mask that best fits around the mouth and nose, preferably a non-rebreathing mask. Humidified oxygen is preferred. If a mask is not tolerated, then "blow by" oxygen is acceptable.

**NOTE: HIGH CONCENTRATION OXYGEN SHOULD ALWAYS BE USED IN PEDIATRIC PATIENTS.**

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

## Revision/Update of REMAC Prehospital Treatment & Transport Protocols

Pediatric patients exhibiting signs of respiratory failure require assisted ventilations via a mask that completely covers the mouth and nose, but not the eyes. This shall be done utilizing one of the following methods:

- Pocket mask with supplemental oxygen set at 10-15 liters/minute;
- Bag-Valve-Mask and reservoir with flow set at 10-15 liters/minute;
- ~~Mouth-to-mouth (or mouth and nose) at provider option, only when adjuncts are not available.~~

## PREHOSPITAL SEDATION

### Definition of Prehospital Sedation:

Prehospital sedation is a fully monitored pharmacologic intervention applied in instances where conscious patients may need short-term analgesic and/or anxiolytic therapy for procedures that may be painful or anxiety producing, such as Endotracheal Intubation, Synchronized Cardioversion, and Transcutaneous Pacing. Prior Permission from Medical Control Is Required.

### Indications for Prehospital Sedation:

#### Conscious patients requiring *Endotracheal Intubation*

- Administer Diazepam 5 – 10 mg, IV/Saline Lock bolus. Repeat doses of Diazepam 5 – 10 mg, IV/Saline Lock bolus, may be given as necessary. (Maximum total dosage is 20 mg.)  
OR
- Administer Midazolam 1 – 2 mg, IV/IN/Saline Lock bolus. Repeat doses of Midazolam 1 mg, IV/IN/Saline Lock bolus, may be given as necessary. (Maximum total dosage is 5 mg.)  
OR
- Administer Etomidate 0.3 mg/kg, IV/Saline Lock bolus, over 30-60 seconds. (Maximum total dose is 20 mg.) After successful intubation, administer Diazepam 5 mg IV/Saline Lock bolus or Lorazepam 2 mg, IV/Saline Lock or IM, for continued sedation.

#### Conscious patients requiring *Synchronized Cardioversion* OR *Transcutaneous Pacing*

- Administer Diazepam 5 – 10 mg, IV/Saline Lock bolus. Repeat doses of Diazepam 5 – 10 mg, IV/Saline Lock bolus, may be given as necessary. (Maximum total dosage is 20 mg.)  
OR
- Administer Midazolam 1 – 2 mg, IV/IN/Saline Lock bolus. Repeat doses of Midazolam 1 mg, IV/ IN/Saline Lock bolus, may be given as necessary. (Maximum total dosage is 5 mg.)  
OR
- For synchronized Cardioversion only, administer Etomidate, 0.15mg/kg, IV/Saline Lock bolus. (Maximum total dose is 10mg.)

**Rationale – Prehospital Sedation**

Because of the hemodynamic profile of etomidate, particularly when compared to benzodiazepines, we recommend this change to allow for short-acting, hemodynamically safe sedation for the patient requiring synchronized cardioversion.

**NOTE: PATIENTS RECEIVING PREHOSPITAL SEDATION MUST BE CONTINUOUSLY ADMINISTERED HIGH CONCENTRATION OXYGEN AND MUST BE CONTINUOUSLY MONITORED USING CARDIAC MONITORING AND PULSE OXIMETRY.**

**COMMUNICATIONS WITH MEDICAL CONTROL FACILITIES**

~~Under no circumstances is an AEMT-P to operate at the scene for more than 20 minutes after making patient contact without attempting to contact Medical Control.~~

In the event of failure of voice contact with Medical Control, AEMT-Ps will perform only those procedures which come under Standing Orders and will be required to transport the patient.

**Rationale – Communication with Medical Control Facilities**

As you will recall, past discussions centered around the recommendation that this section be removed from the GOPs given the median and mean scene times for EMS calls in this City, both exceeding 20 minutes, and the inability of any OLMC facility to handle this number of calls were this GOP to be enforced. As discussed at the Protocol Committee meeting, the greatly expanded use of standing orders now allows paramedics to operate without needing OLMC interaction for a much longer period of time than in the past. Additionally, any limitation imposed for on-scene operations was felt to be an operational issue for each agency and therefore not required within these medical protocols.

# BASIC LIFE SUPPORT PROTOCOLS

**July 2009**  
Version 070109b

**Recommended Changes  
Protocol Committee  
October 9, 2009  
Presented to:**

**Medical Standards – 10/20/09  
REMAC – 10/20/09**

**REMAC approved version  
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Public Notice: October 28, 2009  
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401

RESPIRATORY DISTRESS/FAILURE

**NOTE: ALL PATIENTS WHO ARE IN RESPIRATORY ARREST MUST HAVE VENTILATORY ASSISTANCE UNLESS A VALID NEW YORK STATE PREHOSPITAL DNR ORDER AND/OR MOLST IS PRESENTED TO THE CREW.**

1. Monitor the airway.
2. If an obstructed airway is suspected, see Protocol #402.
3. Administer oxygen.
4. For patients over one (1) year of age who are experiencing exacerbation of asthma or wheezing, see protocol #407.
5. Do **NOT** permit physical activity.
6. Request Advanced Life Support assistance.
7. Monitor breathing for adequacy.

**NOTE: MONITOR BREATHING CONTINUOUSLY. BE ALERT FOR SIGNS OF HYPOXIA AND/OR INCREASING RESPIRATORY DISTRESS.**

8. Place the patient in a Fowler's, semi-Fowler's position, or in a position of comfort.
9. Transport.
10. **For If** the patient ~~is breathing at a rate less than 8 or greater than 24 times per minute with signs of on-going hypoxia, inability to adequately protect their airway,~~ and/or exhibiting signs of inadequate respiration, assisted ventilations may be required. The presence of a valid DNR order does not alter this requirement for a patient who is not in respiratory or cardiac arrest. This should be done utilizing one of the following methods:
  - Pocket mask with supplemental oxygen set at 10-15 liters/minute.
  - Bag-Valve-Mask and reservoir with flow set at 10-15 liters/minute.
  - ~~Mouth-to-mouth or mouth-to-mouth and nose (at provider option, only when adjuncts are not available).~~

**NOTE: DO NOT USE A DEMAND VALVE RESUSCITATOR DUE TO THE POSSIBILITY OF CAUSING SEVERE, LIFE-THREATENING COMPLICATIONS**

11. Transport.

**Rationale – 401**

In spite of the arbitrary numbers referred to in some curricula or texts, we recommend that our providers (of all certification levels) be taught and guided by protocols that recommend artificial ventilation when it is physiologically indicated, not based simply upon respiratory rate.

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407

WHEEZING

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For patients over one (1) year of age who are experiencing exacerbation of asthma or wheezing.

1. Assess the airway
2. Administer oxygen
3. Monitor breathing

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**NOTE: IF PATIENT EXHIBITS SIGNS OF IMMINENT RESPIRATORY FAILURE, REFER TO PROTOCOL #401 – ADULT RESPIRATORY DISTRESS/FAILURE OR #450 – PEDIATRIC RESPIRATORY DISTRESS/FAILURE.**

4. Do not permit physical activity
5. Place the patient in a Fowler's or Semi-Fowler's position
6. Assess the following prior to administration of the first nebulized treatment:
  - Vital signs
  - Patient's ability to speak in complete sentences
  - Accessory muscle use
  - Wheezing
7. **Administer Albuterol Sulfate 0.083%, one (1) unit dose or 3 cc via nebulizer at a flow rate that will deliver the solution over 5 minutes to 15 minutes. Do not delay transport to complete medication administration.**
8. Begin transport.

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**NOTE: FOR PATIENTS IN SEVERE RESPIRATORY DISTRESS, CALL FOR ADVANCED LIFE SUPPORT ASSISTANCE. DO NOT DELAY TRANSPORT.**

9. If symptoms persist, Albuterol Sulfate 0.083% may be repeated twice for a total of three (3) doses, with the third occurring during transport.

**10. If the patient is having severe respiratory distress or shock and is under 33 years of age, administer 0.3 mg Epinephrine (ONE DOSE ONLY) via an auto-injector.**

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**NOTE: ADMINISTRATION OF EPINEPHRINE VIA AUTO-INJECTOR MUST BE REPORTED TO ON-LINE MEDICAL CONTROL AND YOUR AGENCY'S MEDICAL DIRECTOR AS SOON AS POSSIBLE**

**11. Contact On-Line Medical Control for authorization to administer a second administration of 0.3 mg Epinephrine via an auto-injector, if needed.**

12. Upon completion of patient treatment or transfer of patient care to an ALS Provider or a 911 Receiving Hospital, reassess the patient. See Step # 6.

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**NOTE: MEDICAL CONTROL MUST BE CONTACTED FOR ANY PATIENT REFUSING MEDICAL ASSISTANCE OR TRANSPORT.**

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**Rationale:**

This change proposes to administer epi-pen to patients under 33 years old who are experiencing severe asthma or anaphylaxis, without prior permission of on line medical control, without having been prescribed an epi-pen by their personal physicians

ANAPHYLACTIC REACTION

**NOTE: ANAPHYLAXIS CAN BE A POTENTIALLY LIFE THREATENING SITUATION MOST OFTEN ASSOCIATED WITH A HISTORY OF EXPOSURE TO AN INCITING AGENT/ALLERGEN (BEE STING OR OTHER INSECT VENOM, MEDICATIONS/DRUGS, OR FOODS SUCH AS PEANUTS, SEAFOOD, ETC.). THE PRESENCE OF RESPIRATORY DISTRESS (UPPER AIRWAY OBSTRUCTION [STRIDOR], SEVERE BRONCHOSPASM [WHEEZING]) AND/OR CARDIOVASCULAR COLLAPSE/HYPOTENSIVE SHOCK CHARACTERIZE THE CLINICAL FINDINGS THAT AUTHORIZE AND REQUIRE TREATMENT ACCORDING TO THIS PROTOCOL. THIS PROTOCOL APPLIES TO PATIENTS 9 YEARS OF AGE OR OLDER, OR PATIENTS WEIGHING MORE THAN 30 KG (66 LBS).**

1. Determine that the patient's history includes a history of anaphylaxis, severe allergic reaction and/or recent exposure to an allergen or inciting agent.
2. Request Advanced Life Support assistance, if available. Do NOT delay transport.
3. Administer high concentration oxygen.
4. Assess the cardiac and respiratory status of the patient.
  - a. If both the cardiac and respiratory status of the patient are normal, initiate transport.
  - b. If either the cardiac or respiratory status of the patient is abnormal, proceed as follows:
    - i. If the patient is having severe respiratory distress or shock and has been prescribed an Epinephrine auto-injector, assist the patient in administering the Epinephrine (0.3 mg via an auto-injector). If the patient's auto-injector is not available or expired administer the Epinephrine (0.3 mg via an auto-injector).
    - ii. If the patient has not been prescribed an Epinephrine auto-injector and is under 33 years of age, begin transport and contact On-Line Medical Control for authorization to administer 0.3 mg Epinephrine (ONE DOSE ONLY) via an auto-injector.

**~~NOTE: IN THE EVENT THAT YOU ARE UNABLE TO MAKE CONTACT WITH ON-LINE MEDICAL CONTROL (RADIO FAILURE, NO COMMUNICATIONS) AND THE PATIENT IS UNDER 33 YEARS OF AGE, YOU MAY ADMINISTER 0.3 mg EPINEPHRINE (ONE DOSE ONLY) VIA AN AUTO-INJECTOR IF INDICATED. THE INCIDENT~~**

**NOTE: ADMINISTRATION OF EPINEPHRINE VIA AUTO-INJECTOR MUST BE REPORTED TO ON-LINE MEDICAL CONTROL AND YOUR AGENCY'S MEDICAL DIRECTOR AS SOON AS POSSIBLE**

- iii. Contact On-Line Medical Control for authorization to administer a second administration of 0.3 mg Epinephrine via an auto-injector, if needed.
- iv. Refer immediately to the REMAC Prehospital Treatment Protocol for Respiratory Distress/Failure (#401), Obstructed Airway (#402), or Shock (#415) as appropriate.

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

## Revision/Update of REMAC Prehospital Treatment & Transport Protocols

5. If cardiac arrest occurs, refer immediately to the REMAC Prehospital Treatment Protocol for Non-Traumatic Cardiac Arrest (#403).

MANDATORY QUALITY ASSURANCE COMPONENT: FOR EVERY ADMINISTRATION OF EPINEPHRINE VIA AUTO-INJECTOR, THE ACR/PCR DOCUMENTATION MUST BE REVIEWED BY THE SERVICE MEDICAL DIRECTOR, WHO IS THEN RESPONSIBLE FOR FORWARDING A COPY OF THE ACR/PCR TO THE NYC REMAC FOR SYSTEM-WIDE QA PURPOSES. FOR THE PURPOSES OF PATIENT CONFIDENTIALITY, COPIES OF THE PCR/ACR CAN BE MAILED TO: THE REGIONAL EMS COUNCIL OF NYC, 475 RIVERSIDE DRIVE, SUITE 1929, NEW YORK, NEW YORK 10115. PLEASE LABEL THE ENVELOPE "CONFIDENTIAL QA".

### **Rationale:**

This change proposes to administer epi-pen to patients under 33 years old who are experiencing severe asthma or anaphylaxis, without prior permission of on line medical control, without having been prescribed an epi-pen by their personal physicians

421

HEAD AND SPINE INJURIES

1. Establish and maintain airway control while stabilizing the cervical spine.

**NOTE: DO NOT USE A NASOPHARYNGEAL AIRWAY IN PATIENTS WITH FACIAL INJURIES OR IF SEVERE HEAD INJURY HAS OCCURRED.**

2. Patients meeting one or more of the following criteria, **either at the time of evaluation or at any time following the injury in question**, must be immobilized:
  - i. Altered mental status for any reason, including possible intoxication due to drugs or alcohol.
  - ii. GCS <15
  - iii. Complaint of, or inability of the provider to assess for, neck and/or spine pain or tenderness.
  - iv. Weakness, paralysis, tingling, or numbness of the trunk or extremities at any time since the injury.
  - v. Deformity of the spine not present prior to the injury.
  - vi. Distracting injury or circumstances, including anything producing an unreliable physical exam or history.
  - vii. High risk mechanism (axial load such as diving or tackling, high-speed motor vehicle accidents, rollover accidents, falls greater than standing height).
  - viii. Provider concern for potential spinal injury.

**NOTE: ONCE SPINAL IMMOBILIZATION HAS BEEN INITIATED, IT MUST BE COMPLETED. SPINAL IMMOBILIZATION MAY NOT BE REMOVED IN THE PREHOSPITAL SETTING.**

**Rationale – 421**

Consistent with the intent of this protocol, having noted several issues where providers felt that these conditions were only applicable at the time of their evaluation, and in keeping with the intent of the NEXUS criteria upon which this protocol is based, we recommend this wording change to more accurately communicate this protocol.

3. If necessary to initiate spinal immobilization, utilize the Rapid Takedown technique **ONLY** if the patient is standing.
4. Administer oxygen.
5. Monitor breathing for adequacy.

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**NOTE: MONITOR BREATHING CONTINUOUSLY. BE ALERT FOR SIGNS OF HYPOXIA AND/OR INCREASING RESPIRATORY DISTRESS.**

- Control external bleeding.
- If the patient meets any of the criteria described in #2, is not awake or is unstable, immobilize the patient's head and spine with a rigid collar and appropriate immobilization device.
- Assess and monitor the Glasgow Coma Score. (See Appendix E.)

NOTE: If the Glasgow Coma Scale (GCS) score is less than 8, ventilate the patient with high concentration oxygen at a rate of 12 breaths per minute for an adult patient and up to 20 breaths per minute for a pediatric patient.

NOTE: If the Glasgow Coma Scale (GCS) score is less than 8, and active seizures or one or more of the following signs of brain herniation are present, hyperventilate the patient with high concentration oxygen at a rate of 20 breaths per minute for an adult patient and up to 25 breaths per minute for a pediatric patient.

- a. Fixed or asymmetric pupils
- b. Abnormal flexion or extension (neurologic posturing)
- c. Hypertension and bradycardia (Cushing's Reflex)
- d. Intermittent apnea (periodic breathing)
- e. Further decrease in GCS score of 2 or more points (neurologic deterioration)

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**1. DO NOT HYPERVENTILATE UNLESS THE ABOVE CRITERIA ARE MET.**

- Assess for shock and treat, if appropriate. (See Protocol #415.)
- Transport. (See Appendix F.)

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423

**CHEST INJURIES**

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1. Monitor the airway.
2. Observe spinal injury precautions, if appropriate. (See Protocol #421.)
3. Administer oxygen.

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**NOTE: DO NOT USE A DEMAND VALVE RESUSCITATOR DUE TO THE POSSIBILITY OF CAUSING SEVERE, LIFE-THREATENING COMPLICATIONS.**

1. Monitor breathing for adequacy.
2. Control external bleeding.
3. For Special Considerations, see below.
4. Assess for shock and treat, if appropriate. (See Protocol #415.)
5. Position the patient on the affected side unless it will complicate the injury.
6. Transport. (See Appendix F.)

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**NOTE: DECREASED BREATH SOUNDS AND MUFFLED HEART SOUNDS INDICATE LIFE-THREATENING CHEST INJURIES. THE PATIENT SHOULD BE TRANSPORTED IMMEDIATELY.**

**SPECIAL CONSIDERATIONS**

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**OPEN CHEST WOUND:**

1. Place an occlusive dressing over the wound and tape on three sides.
2. If the patient's condition worsens, remove the occlusive dressing and have the patient fully exhale. Replace and re-tape the occlusive dressing on three sides after exhalation, and request Advanced Life Support assistance.

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**CLOSED CHEST WOUND:**

1. If the patient's condition worsens, request Advanced Life Support assistance.

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**FLAIL CHEST:**

1. ~~Secure bulky dressings with tape over the flail segment.~~ **If the patient's condition worsens, request Advanced Life Support assistance**

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**IMPALED OBJECTS:**

1. Do **NOT** remove the object.
2. Support and secure the object with bulky dressings.

**Rationale – 423**

Current recommendations no longer include the use of bulky dressings to treat suspected flail segments (the thought being that the increased pain and work of breathing may counteract any benefit gained by splinting the affected area. We therefore recommend this change.

425

**BONE AND JOINT INJURIES**

1. Monitor the airway.
2. Administer oxygen, if appropriate.
3. Control external bleeding.
  - Avoid excessive pressure over injury sites.
4. Assess for shock and treat, if appropriate. (See Protocol #415.)

**NOTE: IF TRANSPORT IS DELAYED OR SEVERE PAIN PREVENTS APPROPRIATE TREATMENT, REQUEST ADVANCED LIFE SUPPORT ASSISTANCE FOR PAIN MANAGEMENT.**

5. Manually stabilize the injury.
6. Cover protruding bones and associated wounds with dry, sterile dressings.
7. Immobilize the injury.

**NOTE: CHECK FOR PERIPHERAL (DISTAL) PULSES, MOTOR FUNCTION, AND SENSATION IN THE INJURED EXTREMITY BEFORE AND AFTER IMMOBILIZATION.**

- Angulated long bone deformities should be straightened provided resistance is not felt, into a splintable position.
  - Joints above and below the deformity should be immobilized.
  - A deformed joint should be immobilized in the position found, unless it cannot be effectively immobilized in this position.
  - A traction splint is the splint of choice for all isolated **closed** femur fractures.
8. Elevate the injury site, if possible.

**NOTE: SPLINTING SHOULD NOT DELAY TRANSPORT OF THE CRITICAL OR UNSTABLE PATIENT.**

9. Transport. (See Appendix F.)

**Rationale – 425**

As we do in other protocols, we recommend this change to refer BLS providers to the ability of ALS providers to provide appropriate care in these circumstances.

428

BURNS

1. Monitor the airway.
2. Observe spinal injury precautions, if appropriate. (See Protocol #421.)
3. Administer oxygen.

**NOTE: PATIENTS WITH INHALATION INJURY SHOULD RECEIVE HUMIDIFIED OXYGEN (IF AVAILABLE) AND REQUIRE ADVANCED LIFE SUPPORT ASSISTANCE.**

4. Stop the burning process.
5. Prevent contamination of the wound. Avoid making contact with non-sterile materials if possible. Do not remove clothing adherent to the wound.
6. Monitor breathing for adequacy.
7. Assess for shock and treat, if appropriate. (See Protocol #415.)

**NOTE: IF TRANSPORT IS DELAYED OR SEVERE PAIN PREVENTS APPROPRIATE TREATMENT, REQUEST ADVANCED LIFE SUPPORT ASSISTANCE FOR PAIN MANAGEMENT.**

8. For Special Considerations, see below.
9. Calculate the percentage and degree of affected areas. (See Appendix G.)
10. For burns less than 10% BSA, cover the affected areas with saline-moistened, sterile dressings, then wrap in dry, sterile sheets. For burns greater than 10% BSA, cover the affected areas with dry, sterile dressings, then wrap in dry, sterile sheets.
11. Maintain body temperature.

**NOTE: LARGE BODY SURFACE AREA INVOLVEMENT MAY LEAD TO RAPID HEAT LOSS IN THE BURN PATIENT.**

12. Transport. (See Appendices G and H.)

**Rationale – 428**

The most important caution when treating burns is to prevent the loss of body heat. In burns less than 10%BSA, loss of body heat is less likely and moist dressings are less likely to adhere to the burnt area. In larger burns, the more serious concern is loss of body heat, so dry sterile bandages and sheets are used. The other change is to remind BLS providers that ALS is available to provide pain management for patients.

## SPECIAL CONSIDERATIONS

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### THERMAL BURNS:

1. Cool hot or smoldering skin (up to 20% of the body surface area at a time) with cool water or Normal Saline (0.9% NS), ~~or saline-moistened, sterile dressings.~~

### CHEMICAL BURNS:

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**NOTE: TAKE PRECAUTIONS TO AVOID CONTAMINATION OF YOURSELF AND OTHERS.**

1. Obtain the name of the product, if possible.
2. Remove any contaminated clothing or personal articles.
3. Brush dry agents off the skin, then flush with water for at least 10 minutes.
4. Blot any excessive liquids from the skin, then flush liquid chemical agents with water:
  - a. From the skin for at least 10 minutes.
  - b. From the eyes for at least 20 minutes.

### ELECTRICAL BURNS:

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**NOTE: BE ALERT FOR CERVICAL SPINE AND OTHER SKELETAL INJURIES.**

1. Begin Basic Cardiac Life Support procedures, if appropriate. (See Protocol #403.)
2. Observe spinal injury precautions, if appropriate. (See Protocol #421.)
3. Request Advanced Life Support assistance.
4. Locate and bandage the **obvious** entrance and exit wounds.
5. Treat skeletal injuries, if appropriate. (See Protocol #425.)

430

EMOTIONALLY DISTURBED PATIENT

**NOTE: EMOTIONALLY DISTURBED PATIENTS MUST BE PRESUMED TO HAVE AN UNDERLYING MEDICAL OR TRAUMATIC CONDITION CAUSING AN ALTERED MENTAL STATUS.**

**ASSESS SUCH PATIENTS FOR AN UNDERLYING MEDICAL OR TRAUMATIC CONDITION CAUSING AN ALTERED MENTAL STATUS AND TREAT AS NECESSARY.**

1. Assess the situation for potential or actual danger and establish a safe zone, if necessary.

**NOTE: ALL SUICIDAL OR VIOLENT THREATS OR GESTURES MUST BE TAKEN SERIOUSLY. THESE PATIENTS SHOULD BE IN POLICE CUSTODY IF THEY POSE A DANGER TO THEMSELVES AND/OR OTHERS.**

2. If an underlying medical or traumatic condition causing an altered mental status is not apparent; the patient is fully conscious, alert, and able to communicate; and an emotional disturbance is suspected, proceed as follows:

- Request police assistance, if appropriate.

**NOTE: IF THE PATIENT IS AT RISK FOR RESPIRATORY OR CARDIAC ARREST BY CONTINUING TO STRUGGLE WHILE BEING PHYSICALLY RESTRAINED BY POLICE, REQUEST ADVANCED LIFE SUPPORT ASSISTANCE.**

- Open communications with the patient.
- Attempt to determine the cause of the immediate crisis.
- Attempt to obtain a past medical history.
- Document the exact nature of the problem, including the patient's own words.
- If, in the judgment of the EMT/AEMT, the patient requires and is refusing treatment and the patient's judgment may be impaired, contact Medical Control.
- The EMT/AEMT may participate in restraining a patient if a police officer requests assistance or when it becomes necessary for self-protection.

**NOTE: ONLY THE AMOUNT OF FORCE REQUIRED TO EFFECTIVELY RESTRAIN THE PATIENT MAY BE USED.**

**Rationale – 430**

As we do in other protocols, we recommend this change to refer BLS providers to the ability of ALS providers to provide appropriate care in these circumstances.

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## *Revision/Update of REMAC Prehospital Treatment & Transport Protocols*

3. If the patient continues to struggle while being physically restrained, request ALS for possible chemical restraint.
4. Transport.
5. Assess and monitor Glasgow Coma score. (See Appendix E.)
  - Do **NOT** delay transport.

---

431

**HEAT-RELATED EMERGENCIES**

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1. Cool the environment or move the patient to a cooler environment.
2. Remove excessive clothing.
3. Administer oxygen.
4. Restrict physical activity.
5. Assess for shock and treat, if appropriate. (See Protocol #415.)
6. For Special Considerations, see below.
7. Transport.

**SPECIAL CONSIDERATIONS**

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**HEAT CRAMPS:**

Provide water by mouth.

**HEAT EXHAUSTION:**

Provide water by mouth if the patient is conscious, has a gag reflex, and is able to drink without assistance.

**HEAT STROKE:**

Monitor the airway.

Cool the patient **rapidly**.

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**NOTE: DO NOT LOWER BODY TEMPERATURE SO AS TO PRODUCE SHIVERING. THE COOLING OF THE PATIENT SHOULD NOT DELAY TRANSPORT.**

**Rationale – 431**

Has anyone attempted to drink normal saline? In order to avoid unnecessary nausea and vomiting, we recommend that this be removed from this protocol.

THE REGIONAL EMERGENCY MEDICAL ADVISORY COMMITTEE  
NEW YORK CITY

PREHOSPITAL TREATMENT PROTOCOLS

# ADVANCED LIFE SUPPORT (PARAMEDIC) PROTOCOLS

July 2009  
Version 070109a

**Recommended Changes  
Protocol Committee  
October 9, 2009**

**Presented to:**

**Medical Standards – 10/20/09  
REMAC – 10/20/09**

**REMAC approved version  
10/20/2009  
Public Notice: October 28, 2009  
Approved by SEMAC December 2009**

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500-A

**SMOKE INHALATION AND/OR SUSPECTED CARBON MONOXIDE EXPOSURE**

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This protocol should be utilized ONLY for the management of symptomatic patients after exposure to smoke in an enclosed space.

1. Begin Basic Life Support Procedures
2. If necessary, perform Endotracheal Intubation\*.
3. Begin cardiac & pulse oximetry monitoring.
4. Begin SpCO monitoring, if available
5. Begin two IV infusions of Normal Saline (0.9% NS). Refer also to Protocol #528 for all patients with burns.
6. Patients with the following symptoms, after exposure to smoke in an enclosed space, should be administered the medications listed in Table 1, if available.
  - Hypotension not attributable to other obvious causes
  - Altered mental status
  - Coma
  - Seizures
  - Respiratory arrest
  - Cardiac arrest

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**NOTE: PRIOR TO ADMINISTRATION OF HYDROXOCOBALAMIN, OBTAIN THREE BLOOD SAMPLES USING THE TUBES PROVIDED IN THE CYANIDE TOXICITY KIT.**

**NOTE: WHENEVER HYDROXOCOBALAMIN IS ADMINISTERED, FOLLOW WITH A 20ML FLUSH OF NORMAL SALINE (0.9% NS) PRIOR TO ADMINISTRATION OF ANY OTHER MEDICATION.**

TABLE 1		
AGE GROUP	HYDROXOCOBALAMIN*	SODIUM THIOSULFATE
Infant/Toddler (0-2 years)	¼ bottle	250mg/kg ( <u>3cc/kg prepared solution**</u> <del>1cc/kg of a 25% solution</del> ) administered over 10 minutes, IV
Preschool (3-5 years)	½ bottle	
Grade School (6-13 years)	1 bottle	
Adult (≥14 years)	2 bottles (entire kit)	12.5g ( <del>50cc of a 25%</del> <u>150mL of a prepared solution**</u> ) administered over 10 minutes IV

\* Hydroxocobalamin may be mixed with D5W, normal saline, or lactated ringers. The vented macro drip tubing that accompanies the cyanokit, should be used, wide open to ensure correct administration time of approximately 15 minutes (7.5 minutes per bottle).

\*\* Sodium thiosulfate solution should be prepared by adding 12.5g (50mL) to a 100cc bag of D5W.

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**NOTE: IN THE EVENT THAT ONLY ONE INTRAVASCULAR ACCESS LINE IS ESTABLISHED, ADMINISTER HYDROXOCOBALAMIN FIRST BEFORE SODIUM THIOSULFATE.**

**MEDICAL CONTROL OPTIONS:**

**OPTION A:** Administer Dopamine 5 ug/kg/min, IV/Saline Lock drip. If there is insufficient improvement in hemodynamic status, the infusion rate may be increased until the desired therapeutic effects are achieved or adverse effects appear. (Maximum dosage is 20 ug/kg/min, IV/Saline Lock drip.)

**OPTION B:** Transportation Decision.

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**NOTE: FOR PATIENTS EXHIBITING SIGNS AND SYMPTOMS CONSISTENT WITH CARBON MONOXIDE POISONING, REFER TO GENERAL OPERATING PROCEDURES – TRANSPORTATION DECISIONS AND PROCEDURES: HYPERBARIC CANDIDATES.**

**CYANIDE TOXICITY KIT** (if available)

- 2 – 2.5g bottles of crystalline powder hydroxocobalamin
- 1 – 12.5g bottles of sodium thiosulfate (50 mL of 25% solution)
- 2 – 100mL bag 0.9% NS, D<sub>5</sub>W, LR
- 1 – 100mL bag D<sub>5</sub>W**
- 1 – 2 ml fluoride oxalate whole blood tube
- 1 – 2ml K2 EDTA tube
- 1 – 2ml lithium heparin tube

**Rationale – 500-A and 500-B**

Dr. Isaacs of the FDNY has held a number of discussion with experts in the field of toxicology and other individuals with expertise in this particular area. Based upon those discussions, he has been able to clarify an issue identified by the field related to the proper method of administration of sodium thiosulfate under these two protocols. Those recommendations are described above.

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## 500-B

### CYANIDE EXPOSURE

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**This protocol should be utilized ONLY for the management of critically ill patients with suspected exposure to cyanide.**

*If operating at a scene with suspected cyanide exposure where the total patient count is greater than 5, a class order<sup>1</sup> is required by an FDNY-OMA Medical Director to utilize this protocol due to the likelihood of a Weapons of Mass Destruction attack. Refer to REMSCO WMD protocol management decisions. The class order may be issued by a FDNY-OMA Medical Director who is on-scene or as relayed through an FDNY-OMA Medical Director through On-Line Medical Control (Telemetry) or through FDNY Emergency Medical Dispatch.*

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**NOTE: THE ISSUANCE OF ANY CLASS ORDER SHALL BE CONVEYED TO ALL REGIONAL MEDICAL CONTROL FACILITIES FOR RELAY TO UNITS IN THE FIELD.**

If operating at a scene of with suspected documented cyanide exposure where the total patient count is 5 or less at one time, the following protocol remains as a Standing Order.

TREATMENT WITHIN THE “HOT” AND “WARM” ZONES MAY BE PERFORMED ONLY BY APPROPRIATELY TRAINED PERSONNEL WEARING APPROPRIATE CHEMICAL PROTECTIVE CLOTHING (CPC) AS DETERMINED BY THE FDNY INCIDENT COMMANDER.

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**NOTE: IF PROVIDERS ENCOUNTER A PATIENT WHO HAS NOT BEEN APPROPRIATELY DECONTAMINATED FROM LIQUID CYANIDE, THE PROVIDERS SHOULD LEAVE THE AREA IMMEDIATELY UNTIL SUCH TIME AS APPROPRIATE DECONTAMINATION HAS BEEN PERFORMED.**

1. Begin Basic Life Support Procedures.
2. If necessary, perform Endotracheal Intubation\*.
3. Begin cardiac & pulse oximetry monitoring.
4. Begin two IV infusions of Normal Saline (0.9% NS).
5. Patients with the following symptoms, after exposure to cyanide, should be administered the medications listed in Table 1, if available.
  - Hypotension not attributable to other obvious causes
  - Altered Mental Status
  - Coma
  - Seizures
  - Respiratory arrest

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<sup>1</sup> Class Order - A general order given by a FDNY-OMA Medical Director to perform a specific intervention or interventions at a specific location/s during a specified time period. This order is generally reserved for disaster situations.

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

Revision/Update of REMAC Prehospital Treatment & Transport Protocols

- Cardiac arrest

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**NOTE:** IF THERE ARE NO SIGNS OF CARDIAC/RESPIRATORY ARREST, HYPOTENSION, AMS, COMA, SEIZURES, DECOMPENSATED SHOCK, OR IS NOT OTHERWISE DEEMED CRITICAL: **DO NOT ADMINISTER HYDROCOBALAMIN OR SODIUM THIOSULFATE**. BEGIN TREATMENT AND REFER TO MEDICAL CONTROL OPTION B FOR TRANSPORTATION DECISION.

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**NOTE:** PRIOR TO ADMINISTRATION OF HYDROXOCOBALAMIN, IF POSSIBLE, OBTAIN THREE BLOOD SAMPLES USING THE TUBES PROVIDED IN THE CYANIDE TOXICITY KIT.

AGE GROUP	HYDROXOCOBALAMIN*	SODIUM THIOSULFATE
Infant/Toddler (0-2 years)	¼ bottle	250mg/kg ( <b>3cc/kg prepared solution**</b> <del>4cc/kg of a 25% solution</del> ) administered over 10 minutes, IV
Preschool (3-5 years)	½ bottle	
Grade School (6-13 years)	1 bottle	
Adult (≥14 years)	2 bottles (entire kit)	12.5g ( <del>50cc of a 25%</del> <b>150mL of a prepared solution**</b> ) administered over 10 minutes IV

\* Hydroxocobalamin may be mixed with D5W, normal saline, or lactated ringers. The vented macro drip tubing that accompanies the cyanokit, should be used, wide open to ensure correct administration time of approximately 15 minutes (7.5 minutes per bottle).

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**NOTE:** WHENEVER HYDROXOCOBALAMIN IS ADMINISTERED, FOLLOW WITH A 20ML FLUSH OF NORMAL SALINE (0.9% NS) PRIOR TO ADMINISTRATION OF ANY OTHER MEDICATION.

## MEDICAL CONTROL OPTIONS:

**OPTION A:** Administer Dopamine 5 ug/kg/min, IV/Saline Lock drip. If there is insufficient improvement in hemodynamic status, the infusion rate may be increased until the desired therapeutic effects are achieved or adverse effects appear. (Maximum dosage is 20 ug/kg/min, IV/Saline Lock drip.)

**OPTION B:** Transportation Decision.

## CYANIDE TOXICITY KIT (if available)

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- 2 – 2.5g bottles of crystalline powder hydroxocobalamin
- 1 – 12.5g bottles of sodium thiosulfate (50 mL of 25% solution)
- 2 – 100mL bag 0.9% NS, D<sub>5</sub>W, LR

### **1 – 100mL bag D<sub>5</sub>W**

- 1 – 2 ml fluoride oxalate whole blood tube
- 1 – 2ml K<sub>2</sub> EDTA tube
- 1 – 2ml lithium heparin tube

### **Rationale – 500-A and 500-B**

Dr. Isaacs of the FDNY has held a number of discussion with experts in the field of toxicology and other individuals with expertise in this particular area. Based upon those discussions, he has been able to clarify an issue identified by the field related to the proper method of administration of sodium thiosulfate under these two protocols. Those recommendations are described above.

502

OBSTRUCTED AIRWAY

1. Begin Basic Life Support Obstructed Airway procedures.
2. Perform Direct Laryngoscopy. Attempt to remove the foreign body with Magill Forceps.
3. Perform Endotracheal Intubation.
- ~~4. If unable to perform endotracheal intubation and the airway remains obstructed, perform Needle Cricothyroidotomy. (See Appendix N)~~
4. **If able to confirm intubation via direct visualization but unable to ventilate:**
  - a. **Note the endotracheal tube depth**
  - b. **Deflate the endotracheal tube cuff**
  - c. **Advance the endotracheal tube to its deepest depth**
  - d. **Return the endotracheal tube to its original depth**
  - e. **Re-inflate the endotracheal tube cuff and attempt ventilation again**
  - f. **If unable to effectively ventilate the patient using the above maneuvers, immediately initiate transport**
5. Transportation Decision.

**Rationale – Protocol 502**

**First Issue – Intentional Right Mainstem Displacement**

As you will recall, this language was actually accepted by the REMAC last year but was subsequently rejected by the SEMAC. One of their stated reasons was that this technique had never been described in the literature. Since that time, FDNY paramedics have successfully used this technique to save the life of a child. This case was added to others and has been submitted for publication in the peer-reviewed literature. Failure to use this technique would have resulted in a 20-plus minute anoxic time for this particular three year-old. We believe the value to this technique merits its inclusion in this protocol and resubmission to the SEMAC.

**Second Issue – Removal of Needle Cricothyroidotomy**

One published case series is often used to describe the efficacy of this procedure, with no immediate fatalities reported as a result of this procedure (Patel RG. Percutaneous transtracheal jet ventilation. Chest 1999;116:1689–94. - <http://www.mdconsult.com/das/article/body/159240626-8/jorg=journal&source=MI&sp=11141198&sid=886415344/N/161055/1.html?issn=0012-3692> ) But this series included the use of transtracheal jet ventilation. Low pressure ventilation (i.e. BVM) was initially described in 1909 by Meltzer (Meltzer SJ, Auer J: Continuous respiration without respiratory movement. *J Exp Med* 1909; 11:622.) but reported the success of this procedure in anesthetized dogs for whom the technique allowed for 30 minute survival when the dogs were neither hypoxic nor hypercarbic at the time of the procedure.

The FDNY performed a review of all adult and pediatric patients on whom this procedure was performed. Every patient who was pulseless at the time of the procedure remained pulseless upon ED arrival. Every patient with intact perfusion at the time of procedure progressed to cardiopulmonary arrest prior to ED arrival. No patient in either group survived. We therefore recommend its removal.

503

NON-TRAUMATIC CARDIAC ARREST

1. Begin Basic Life Support Non-Traumatic Cardiac Arrest procedures.
2. Begin Cardiac Monitoring, record and evaluate EKG rhythm, ~~preferably using quick-look paddles.~~

Sub-Protocols\*

- 503-A Ventricular Fibrillation/Pulseless Ventricular Tachycardia
- 503-B Pulseless Electrical Activity (PEA)/Asystole

- \* In the event that initial EKG rhythm changes, refer to the appropriate cardiac arrest sub-protocol. Complete Standing Orders without repetition of previously administered drugs and contact Medical Control for further orders.

**Rationale – Protocol 503**

In addition to the fact that most manufacturers no longer produce manual defibrillators that utilize “paddles,” the American Heart Association also states in its 2005 Guidelines that “self-adhesive pads should be used routinely instead of standard paddles (Class IIa; LOE 2, 4).” ([http://circ.ahajournals.org/cgi/reprint/112/24\\_suppl/IV-35](http://circ.ahajournals.org/cgi/reprint/112/24_suppl/IV-35)) We therefore recommend the removal of the language noted above.

503-A

VENTRICULAR FIBRILLATION/PULSELESS VENTRICULAR TACHYCARDIA

1. Continue CPR with minimal interruption.

NOTE:IN ARRESTS WITNESSED BY EMS, PERFORM CPR UNTIL DEFIBRILLATOR IS ATTACHED

IN ARRESTS NOT WITNESSED BY EMS, PERFORM TWO (2) MINUTES OF CPR PRIOR TO DEFIBRILLATOR USE

2. Defibrillate using **the maximum joule setting possible (may vary depending on the defibrillator in use).**

NOTE:IF PATIENT HAS A PERMANENT PACEMAKER IN PLACE, POSITION THE PADDLES OR AUTOMATED DEFIBRILLATOR PADS AT LEAST ONE (1) INCH AWAY FROM THE PACEMAKER DEVICE.

3. Continue CPR. If after two minutes of additional CPR if there is no change in the rhythm, Defibrillate a 2<sup>nd</sup> time as previously stated.-
4. Continue CPR. If after two minutes of additional CPR if there is no change in the rhythm, Defibrillate a 3<sup>rd</sup> time as previously stated.-
5. Perform Endotracheal Intubation.

**Rationale – Protocol 503A**

**Removal of Term “Biphasic Equivalent”**

The 2005 AHA Guidelines noted that there was insufficient evidence to recommend a particular energy setting for biphasic defibrillators. This lack of evidence is made more difficult to interpret in light of the various waveforms (truncated exponential, rectilinear, etc.) than have been patented by each of the manufacturers. In recent years, emerging science from Europe has found that higher energy biphasic defibrillation may yield greater efficacy (first shock success) with no increase in harm (mortality) in the treatment of VF. (D. Mueller, J. Breckwoldt, G. Möhl, H. Arntz Efficacy of biphasic 150J and 200J shocks in out-of-hospital ventricular fibrillation *Resuscitation*, Volume 77, Issue null, Pages S18-S18) In order to take this literature into account and to avoid confusion, we recommend that the protocol be changed to direct providers to deliver higher energy biphasic defibrillation as above.

6. If, after every two minute interval of additional CPR, there is no change in the rhythm, Defibrillate\* as previously stated.
7. Begin an IV/IO infusion of Normal Saline (0.9% NS) to keep vein open, or a Saline Lock.
8. Administer Vasopressin 40 unit IV/IO/Saline Lock Bolus, single dose.
9. If there is no change in the rhythm, administer Amiodarone 300mg, diluted up to a total of 20mL of D<sub>5</sub>W, IV / IO / Saline Lock bolus.

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10. If there is no change in the rhythm within 3 – 5 minutes after the administration of Vasopressin, administer Epinephrine 1 mg (10 ml of a 1:10,000 solution), IV/IO/Saline Lock bolus, every 3 – 5 minutes.
11. If there is insufficient improvement in hemodynamic status, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:-

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### **MEDICAL CONTROL OPTIONS:**

- OPTION A:** If Ventricular Fibrillation or Pulseless Ventricular Tachycardia recurs, a repeat dose of 150 mg Amiodarone diluted up to a total of 10 ml D<sub>5</sub>W, IV/IO/Saline Lock Bolus may be given.
- OPTION B:** Administer Sodium Bicarbonate 44-88 mEq IV/IO/Saline Lock bolus. Repeat doses of Sodium Bicarbonate 44 mEq, IV/IO/Saline Lock bolus, may be given every 10 minutes.
- OPTION C:** Administer Magnesium Sulfate 2 gm, IV/IO/Saline Lock bolus, diluted in 10 ml of Normal Saline (0.9% NS), over 2 minutes.
- OPTION D:** In cases of hyperkalemia or Calcium Channel Blocker overdose administer Calcium Chloride (CaCl<sub>2</sub>) 1 gm, SLOWLY, IV/IO/Saline Lock bolus. Follow with a Normal Saline (0.9% NS) flush.
- OPTION E:** Transportation Decision.

503-B

PULSELESS ELECTRICAL ACTIVITY (PEA)/ASYSTOLE

NOTE: CONSIDER THE POSSIBILITY OF CONDITIONS MASQUERADING AS PEA/ASYSTOLE WHICH REQUIRE IMMEDIATE TREATMENT.

1. Continue CPR with minimal interruption.
2. If a tension pneumothorax is suspected, perform Needle Decompression. (See Appendix O.)
3. Perform Endotracheal Intubation.
4. Begin an IV/IO/ infusion of Normal Saline (0.9% NS) to keep vein open, or a Saline Lock.
5. Administer Vasopressin 40 unit IV/IO/Saline Lock Bolus, single dose.
- 6. Administer Dextrose 25 gm (50 ml of a 50% solution), IV/Saline Lock bolus.**

**Rationale – Protocol 503B**

First Issue – Dextrose for Undifferentiated PEA / Asystole

We were recently presented with a case from the NYC Poison Control Center in which a 23 year-old male was transported to the ED without ROSC after full attempts at prehospital resuscitation. As part of the ED resuscitation, the patient was found to have a glucose <35 mg/dL and was administered glucose. Despite a >50 minute resuscitation time, the patient achieved ROSC, survived to hospital admission, and was discharged from the hospital alive.

Past discussions at protocol committee and REMAC have included the thought that the provision of epinephrine to such patients should have resulted in glycolysis and gluconeogenesis, both of which would have remedied this problem. The error in this logic is that it assumes adequate glycogen stores in these patients.

A review of SmartCPR data from the past two years was performed to look at the impact of D50 administration on immediate cardiac arrest outcomes. To address its use among patients with a known history of diabetes and those without such a history, patients were divided accordingly. While ROSC rates were mixed among patients who received D50 (30.7% vs 33.5% in diabetics, 21.1% vs 27.6% in nondiabetics), sustained ROSC rates were uniformly increased in both groups when D50 was administered (22.3% versus 20.6%, 19.1% versus 17.4%).

While multivariate analyses are needed to more clearly define the role of D50 in the undifferentiated PEA / asystole, its use presents no defined risk for such patients and may clearly convey some benefit. We therefore recommend its inclusion in this protocol as noted above.

7. If there is no change in the rhythm within 3 – 5 minutes after administration of Vasopressin, administer Epinephrine 1 mg (10 ml of a 1:10,000 solution), IV/IO/Saline Lock bolus, every 3 – 5 minutes.
8. If the patient has a heart rate (based on rhythm strip) less than 60 beats/min, administer Atropine Sulfate 1 mg, IV/IO/Saline Lock bolus. If the heart rate, remains less than 60 bpm, repeat

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Atropine Sulfate 1 mg, IV/IO/Saline Lock bolus, every 3 – 5 minutes. (Maximum total dosage is 3 mg.)

9. If there is insufficient improvement in hemodynamic status, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

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### **MEDICAL CONTROL OPTIONS:**

**OPTION A:** Administer Sodium Bicarbonate 44-88 mEq IV/IO/Saline Lock bolus. Repeat doses of Sodium Bicarbonate 44 mEq, IV/IO/Saline Lock bolus, may be given every 10 minutes.

**OPTION B:** In cases of hyperkalemia or Calcium Channel Blocker overdose administer Calcium Chloride (CaCl<sub>2</sub>) 1 gm, SLOWLY, IV/IO/Saline Lock bolus. Follow with a Normal Saline (0.9% NS) flush.

**OPTION C:** Begin rapid IV/IO/Saline Lock infusion of Normal Saline (0.9% NS), up to three (3) liters.

**OPTION D:** Transportation Decision.

504

SUSPECTED MYOCARDIAL INFARCTION

1. Begin Basic Life Support Chest Pain procedures.
2. Begin Cardiac Monitoring, record and evaluate EKG rhythm.
3. Perform, record, and evaluate a 12 Lead EKG.

NOTE: AN UNSTABLE DYSRHYTHMIA MUST BE TREATED PRIOR TO INITIATION OF A 12 LEAD EKG.

NOTE: [FOR PATIENTS EXHIBITING ST ELEVATION, REFER TO GENERAL OPERATING PROCEDURES – TRANSPORTATION DECISIONS AND PROCEDURES: STEMI PATIENTS](#)

4. **Initiate transport.**

5. Begin an IV infusion of Normal Saline (0.9% NS) to keep vein open, or a Saline Lock.
6. Monitor vital signs every 2 - 3 minutes.

Sub-Protocols

504-A Drug Therapy of Myocardial Ischemia

504-B Cardiogenic Shock

**Rationale – Protocol 504**

**First Issue –Note Regarding STEMI**

This note is found in the following protocol (504A) and is recommended for inclusion here as well in order to emphasize the need for OLMC contact early in the care of STEMI patients.

**Second Issue – Initiation of Transport Prior to IV Initiation**

In speaking with field paramedics, one of the items that seems to delay the transport of suspected AMI / STEMI patients is the perceived need to establish IV access prior to transport. This recommended change is meant to address that perception. Because the previous note addresses the treatment of dysrhythmias, there is no other common reason to require IV access prior to transport. Even the rare patient who progresses to cardiopulmonary arrest does not require any IV intervention for several minutes as per our existing protocols. With this in mind, and recognizing the need to minimize scene times for AMI / STEMI patients, we recommend that the transport initiation be placed in this protocol as noted above.

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505-A

SUPRAVENTRICULAR TACHYCARDIA

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1. In patients with unstable supraventricular tachycardia, perform Synchronized Cardioversion\* using 100 joules, ~~or equivalent biphasic~~. If this fails to convert the dysrhythmia and the patient still has a pulse, Synchronized Cardioversion may be repeated as necessary, using, 200, 300 and 360 joules, ~~or equivalent biphasic~~.

**NOTE: WHEN USING A DEFIBRILLATOR FOR WHICH THE MAXIMUM JOULE SETTING IS LESS THAN 360 JOULES, FURTHER REPEATED ATTEMPTS AT SYNCHRONIZED CARディオVERSION SHOULD BE PERFORMED USING THE DEFIBRILLATOR'S MAXIMUM SETTING IN PLACE OF THE ENERGIES NOTED ABOVE.**

2. In patients with stable supraventricular tachycardia, administer Adenosine as follows:
  - a. Administer Adenosine 6 mg, IV/Saline Lock bolus, rapidly, followed by a Normal Saline (0.9% NS) flush.
  - b. Observe EKG monitor for 1 – 2 minutes for evidence of cardioversion.
  - c. If there is no evidence of cardioversion, administer Adenosine 12 mg, IV/Saline Lock bolus, rapidly, followed by a Normal Saline (0.9% NS) flush.
  - d. If there is still no evidence of cardioversion, repeat Adenosine 12 mg IV/Saline Lock bolus, rapidly, followed by a Normal Saline (0.9% NS) flush.
1. If Adenosine fails to convert the dysrhythmia or the patient has evidence of low cardiac output, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

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**MEDICAL CONTROL OPTIONS:**

**OPTION A:** If complex width is narrow and blood pressure is normal or elevated, administer Diltiazem 0.25 mg/kg, IV/Saline Lock bolus, slowly, over 2 minutes, monitoring blood pressure continuously.

**OPTION B:** If complex width is narrow and blood pressure is low, perform Synchronized Cardioversion\* using 100 joules, ~~or equivalent biphasic~~. If this fails to convert the dysrhythmia and the patient still has a pulse, Synchronized Cardioversion\* may be repeated as necessary using, 200, 300, and 360 joules, ~~or equivalent biphasic~~.

**OPTION C:** Administer Amiodarone 150 mg, diluted in 100 ml D<sub>5</sub>W over 10 minutes.

**OPTION D:** Transportation Decision.

- 
- *If the patient is alert prior to performing Cardioversion, refer to Prehospital Sedation in General Operating Procedures. Prior Permission from Medical Control Is Required.*

**Rationale – Protocol 505A**

The 2005 AHA Guidelines noted that there was insufficient evidence to recommend a particular energy setting for biphasic defibrillators. This lack of evidence is made more difficult to interpret in light of the various waveforms (truncated exponential, rectilinear, etc.) than have been patented by each of the manufacturers. In recent years, emerging science from Europe has found that higher energy biphasic defibrillation may yield greater efficacy (first shock success) with no increase in harm (mortality) in the treatment of VF. (D. Mueller, J. Breckwoldt, G. Möhl, H. Arntz Efficacy of biphasic 150J and 200J shocks in out-of-hospital ventricular fibrillation *Resuscitation*, Volume 77, Issue null, Pages S18-S18) In order to take this literature into account and to avoid confusion, we recommend that the protocol be changed to direct providers to deliver higher energy biphasic defibrillation as above.

Review of cardioverted patients in this EMS system suggest that there is not a high degree of first-shock efficacy (termination of the dysrhythmia). For this reason, to avoid the injury that may result from cumulative energies, and recognizing the greater efficacy of biphasic cardioversion as opposed to monophasic cardioversion, we recommend beginning biphasic cardioversion at the same energies as those used for monophasic defibrillators.

505-B

ATRIAL FIBRILLATION / ATRIAL FLUTTER

1. In patients with unstable Atrial Fibrillation or Atrial Flutter, perform Synchronized Cardioversion\* using 100 joules, ~~or equivalent biphasic~~. If this fails to convert the dysrhythmia and the patient still has a pulse, Synchronized Cardioversion may be repeated as necessary, using, 200, 300 and 360 joules, ~~or equivalent biphasic~~.

**NOTE: WHEN USING A DEFIBRILLATOR FOR WHICH THE MAXIMUM JOULE SETTING IS LESS THAN 360 JOULES, REPEATED ATTEMPTS AT SYNCHRONIZED CARDIOVERSION SHOULD BE PERFORMED USING THE DEFIBRILLATOR'S MAXIMUM SETTING IN PLACE OF THE ENERGIES NOTED ABOVE.**

2. If Synchronized Cardioversion fails to convert the dysrhythmia, or the patient has stable Atrial Fibrillation or Atrial Flutter with a heart rate of 150 beats per minute or higher, contact Medical Control for implementation of one or more of the following Medical Control options:

**MEDICAL CONTROL OPTIONS:**

**OPTION A:** If complex width is narrow and blood pressure is normal or elevated, administer Diltiazem 0.25 mg/kg, IV/Saline Lock bolus, slowly, over 2 minutes, monitoring blood pressure continuously.

**OPTION B:** Administer Amiodarone 150 mg, diluted in 100 ml D<sub>5</sub>W over 10 minutes.

**OPTION C:** Transportation Decision.

\* *If the patient is alert prior to performing Cardioversion, refer to Prehospital Sedation in General Operating Procedures. Prior Permission from Medical Control Is Required.*

**Rationale – Protocol 505B**

The 2005 AHA Guidelines noted that there was insufficient evidence to recommend a particular energy setting for biphasic defibrillators. This lack of evidence is made more difficult to interpret in light of the various waveforms (truncated exponential, rectilinear, etc.) than have been patented by each of the manufacturers. In recent years, emerging science from Europe has found that higher energy biphasic defibrillation may yield greater efficacy (first shock success) with no increase in harm (mortality) in the treatment of VF. (D. Mueller, J. Breckwoldt, G. Möhl, H. Arntz Efficacy of biphasic 150J and 200J shocks in out-of-hospital ventricular fibrillation *Resuscitation*, Volume 77, Issue null, Pages S18-S18) In order to take this literature into account and to avoid confusion, we recommend that the protocol be changed to direct providers to deliver higher energy biphasic defibrillation as above.

Review of cardioverted patients in this EMS system suggest that there is not a high degree of first-shock efficacy (termination of the dysrhythmia). For this reason, to avoid the injury that may result from cumulative energies, and recognizing the greater efficacy of biphasic cardioversion as opposed to monophasic cardioversion, we recommend beginning biphasic cardioversion at the same energies as those used for monophasic defibrillators.

505-C

VENTRICULAR TACHYCARDIA WITH A PULSE/  
WIDE COMPLEX TACHYCARDIA OF UNCERTAIN TYPE

NOTE: IN PATIENTS WITH PULSELESS VENTRICULAR TACHYCARDIA, SEE SUB-PROTOCOL 503-A.

1. In patients with unstable ventricular tachycardia with a pulse, perform Synchronized Cardioversion\* using 100 joules, ~~or equivalent biphasic~~. If this fails to convert the dysrhythmia and the patient still has a pulse, Synchronized Cardioversion\* may be repeated as necessary using 200, 300 and 360 joules, ~~or equivalent biphasic~~.

**NOTE: WHEN USING A DEFIBRILLATOR FOR WHICH THE MAXIMUM JOULE SETTING IS LESS THAN 360 JOULES, REPEATED ATTEMPTS AT SYNCHRONIZED CARDIOVERSION SHOULD BE PERFORMED USING THE DEFIBRILLATOR'S MAXIMUM SETTING IN PLACE OF THE ENERGIES NOTED ABOVE.**

2. Administer Amiodarone 150 mg, diluted in 100 ml D<sub>5</sub>W over 10 minutes.
3. If Amiodarone fails to convert the dysrhythmia or the patient has evidence of low cardiac output, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

**MEDICAL CONTROL OPTIONS**

**OPTION A:** Perform Synchronized Cardioversion\* using 100 joules, ~~or equivalent biphasic~~. If this fails to convert the dysrhythmia and the patient still has a pulse, Synchronized Cardioversion may be repeated as necessary using 200, 300, and 360 joules, ~~or equivalent biphasic~~.

**Rationale – Protocol 505C**

The 2005 AHA Guidelines noted that there was insufficient evidence to recommend a particular energy setting for biphasic defibrillators. This lack of evidence is made more difficult to interpret in light of the various waveforms (truncated exponential, rectilinear, etc.) than have been patented by each of the manufacturers. In recent years, emerging science from Europe has found that higher energy biphasic defibrillation may yield greater efficacy (first shock success) with no increase in harm (mortality) in the treatment of VF. (D. Mueller, J. Breckwoldt, G. Möhl, H. Arntz Efficacy of biphasic 150J and 200J shocks in out-of-hospital ventricular fibrillation *Resuscitation*, Volume 77, Issue null, Pages S18-S18) In order to take this literature into account and to avoid confusion, we recommend that the protocol be changed to direct providers to deliver higher energy biphasic defibrillation as above.

Review of cardioverted patients in this EMS system suggest that there is not a high degree of first-shock efficacy (termination of the dysrhythmia). For this reason, to avoid the injury that may result from cumulative energies, and recognizing the greater efficacy of biphasic cardioversion as opposed to monophasic cardioversion, we recommend beginning biphasic cardioversion at the same energies as those used for monophasic defibrillators.

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- OPTION B:** Administer Magnesium Sulfate 2 gm, IV/Saline Lock bolus, diluted in 10 ml of Normal Saline (0.9% NS), over 2 minutes.
- OPTION C:** In cases of hyperkalemia or Calcium Channel Blocker overdose administer Calcium Chloride (CaCl<sub>2</sub>) 1 gm, SLOWLY, IV/Saline Lock bolus. Follow with a Normal Saline (0.9% NS) flush.
- OPTION D:** Administer Sodium Bicarbonate 44 - 88 mEq, IV/Saline Lock bolus, for pre-existing acidosis. Repeat doses of Sodium Bicarbonate 44 mEq, IV/Saline Lock bolus, may be given every 10 minutes.
- OPTION E:** Transportation Decision.

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\* *If the patient is alert prior to performing Cardioversion, refer to Prehospital Sedation in General Operating Procedures. Prior Permission from Medical Control Is Required.*

505-D

BRADY DYSRHYTHMIAS and COMPLETE HEART BLOCK

1. If the patient has a ventricular rate of less than 60 beats/min and signs of decompensated shock:
  - a. Administer Atropine Sulfate 0.5 mg, IV/Saline Lock bolus.
  - b. Begin Transcutaneous Pacing\*.
2. If there is insufficient improvement in cardiac status, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

**MEDICAL CONTROL OPTIONS:**

**OPTION A:** Repeat Atropine Sulfate 0.5 mg, IV/Saline Lock bolus every 3 – 5 minutes. (Maximum total dosage is 3 mg.)

**OPTION B:** Administer Dopamine 2 ug/kg/min, IV/Saline Lock drip. If there is insufficient improvement in hemodynamic status, the infusion may be increased until the desired therapeutic effects are achieved or adverse affects appear. (Maximum dosage is 10 ug/kg/min, IV/Saline Lock drip.)

~~**OPTION C:** Administer Epinephrine 2 ug/min, IV/Saline Lock drip. Prepare infusion by adding 1 mg of Epinephrine (1 ml of a 1:1,000 solution) to 250 ml of Normal Saline (0.9% NS) (1 ug/min = 15 ml/hr = 15 gtts/min). If there is insufficient improvement in hemodynamic status, the infusion may be increased until the desired therapeutic effects are achieved or adverse affects appear. (Maximum dosage is 10 ug/min, IV/Saline Lock drip.)~~

**OPTION C:** In cases of hyperkalemia or Calcium Channel Blocker overdose administer Calcium Chloride (CaCl<sub>2</sub>) 1 gm, SLOWLY, IV/Saline Lock bolus. Follow with a Normal Saline (0.9% NS) flush.

**OPTION D:** Administer Sodium Bicarbonate 44 - 88 mEq, IV/Saline Lock bolus, for pre-existing acidosis. Repeat doses of Sodium Bicarbonate 44 mEq, IV/Saline Lock bolus, may be given every 10 minutes.

**OPTION E:** Transportation Decision.

\* *If the patient is alert prior to performing Transcutaneous Pacing, refer to Prehospital Sedation in General Operating Procedures. Prior Permission from Medical Control Is Required.*

**Rationale – Protocol 505D**

The difficulties of the preparation and act of infusing in this step aside (particularly in the absence of IV infusion pumps), the reality is that this step is not utilized. In light of its potential for harm (should any mixing or infusion rate errors occur), and recognizing that this step is not utilized, we recommend its removal.

ACUTE PULMONARY EDEMA

1. Begin Basic Life Support Respiratory Distress procedures.
2. Begin Cardiac Monitoring, record and evaluate EKG rhythm.
3. Begin an IV infusion of Normal Saline (0.9% NS) to keep vein open, or a Saline Lock.
4. Monitor vital signs every 2-3 minutes.
5. Administer Nitroglycerin Tablet 1/150 gr or Spray 0.4 mg, sublingually, every 5 minutes, for a total of 3 doses. Before each administration, check the patient's pulse and blood pressure to ensure the patient is hemodynamically stable.

**NOTE: UNLESS OTHERWISE DIRECTED BY ON-LINE MEDICAL CONTROL, NITROGLYCER SHALL NOT BE ADMINISTERED TO PATIENTS:**

- **WHO HAVE USED ERECTILE DYSFUNCTION MEDICATIONS IN THE PREVIOUS 72 HOURS**

**AND/OR**

- **WITH A SYSTOLIC BLOOD PRESSURE OF LESS THAN 100 mm Hg**

- ~~6. Administer Furosemide 20 – 80 mg, IV/Saline Lock bolus. (Maximum combined total dosage is 80 mg.)~~
7. Initiate CPAP Therapy, if available, (see Appendix P)
8. Contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

**MEDICAL CONTROL OPTIONS:**

**OPTION A:** Administer Morphine Sulfate 0.1mg/kg (not to exceed 5mg), IV/Saline Lock bolus. Repeat doses of Morphine Sulfate 0.1mg/kg (not to exceed 5mg) IV/Saline Lock bolus, may be given as necessary. (Maximum total dosage is 15 mg.)

**NOTE: IF HYPOVENTILATION DEVELOPS, ADMINISTER NALOXONE UP TO 2 MG, IV/SALINE LOCK BOLUS**

**OPTION B:** Administer Lorazepam 1 – 2 mg, IV/IN Saline Lock bolus.

OR

Administer Midazolam 1 – 2 mg, IV/IN Saline Lock bolus.

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**OPTION C:** Repeat Nitroglycerin Tablet 1/150 gr. or Spray 0.4 mg, sublingually.

**OPTION D:** Administer Furosemide 20 – 80 mg, IV/Saline Lock bolus. (Maximum combined total dosage is 80 mg.)

**OPTION D:** Transportation Decision.

MANDATORY QUALITY ASSURANCE COMPONENT: FOR EVERY APPLICATION OF A CPAP ON A PATIENT, THE ACR/PCR DOCUMENTATION MUST BE REVIEWED BY THE SERVICE MEDICAL DIRECTOR, WHO IS THEN RESPONSIBLE FOR FORWARDING A COPY OF THE ACR/PCR TO THE NYC REMAC FOR SYSTEM-WIDE QA PURPOSES.

FOR THE PURPOSES OF PATIENT CONFIDENTIALITY, COPIES OF THE PCR/ACR CAN BE MAILED TO: THE REGIONAL EMS COUNCIL OF NYC, 475 RIVERSIDE DRIVE, SUITE 1929, NEW YORK, NEW YORK 10115. PLEASE LABEL THE ENVELOPE "CONFIDENTIAL QA".

## **Rationale – Protocol 506**

In light of the STEMI and Project Hypothermia Initiatives, as well as the SmartCPR Trial and other on-going efforts to improve cardiac care in the New York City Region, the FDNY formed a Cardiac Quality Assurance Committee comprised of experts in the fields of cardiology, critical care, and emergency medicine from around the City, as well as representatives of the GNYHA, HHC, and REMAC / REMSCO. At its most recent meeting, the issue of the use of furosemide as a standing order for the management of acute pulmonary edema was introduced for discussion.

The literature, reviewed at prior Protocol, Medical Standards, and REMAC meetings, was also discussed. This included discussions of the accuracy of a presumptive diagnosis of APE in the field or upon initial ED evaluation as well as the hemodynamic status of those patients with proved APE (where ~40% are euvolemic or hypovolemic). In addition, we reviewed the literature which notes that the broad use of furosemide in the initial management of APE results in an increase in the number of patients who require ETI, the number admitted to ICUs, the ICU length of stay, and overall morbidity and mortality.

It was the recommendation of this committee that the REMAC remove furosemide from standing orders and move it to the Medical Control Options. For that reason, consistent with past recommendations, we recommend the changes noted above.

510

ANAPHYLACTIC REACTION

- 1) Begin Basic Life Support Anaphylactic Reaction procedures.
- 2) If the patient is exhibiting obvious airway compromise, perform Endotracheal Intubation\*.
- 3) Administer Epinephrine 0.3 mg (0.3 ml of a 1:1,000 solution), IM.
- 4) If the patient has signs of bronchospasm, administer Albuterol Sulfate 0.083% (one unit dose bottle of 3 ml), by nebulizer, at a flow rate that will deliver the solution over 5 – 15 minutes.
- 5) Monitor vital signs every 5 minutes.
- 6) Begin Cardiac Monitoring, record and evaluate EKG rhythm.
- 7) Begin an IV infusion of Normal Saline (0.9% NS) or Ringer's Lactate (RL) via a large bore (14 - 16 gauge) catheter to keep vein open, or a Saline Lock.
- 8) If the patient has signs of decompensated shock:
  - a) Administer Epinephrine 0.1 mg (1 ml of a 1:10,000 solution), diluted in 50 ml Normal Saline (0.9% NS), IV/Saline Lock-drip, over 5 minutes, and
  - b) Begin rapid IV/Saline Lock infusion of Normal Saline (0.9% NS) or Ringer's Lactate (RL), up to 3 liters via macro-drip.
- 9) If the patient has no signs of shock, administer Diphenhydramine 50 mg, IV/Saline Lock bolus, or IM, if IV/Saline Lock access has not been established.
- 10) Contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

**MEDICAL CONTROL OPTIONS:**

**OPTION A:** Repeat any of the above Standing Orders.

**OPTION B:** ~~Administer Epinephrine 1 ug/min, IV/Saline Lock drip. Prepare infusion by adding 1 mg of Epinephrine (1 ml of a 1:1,000 solution) to 250 ml of Normal Saline (0.9% NS) (1 ug/min = 15 ml/hr = 15 gtts/min). If there is insufficient improvement in hemodynamic status, the infusion may be increased until the desired therapeutic effects are achieved or adverse affects appear. (Maximum dosage is 4 ug/min, IV/Saline Lock drip.)~~

**Rationale – Protocol 510**

The difficulties of the preparation and act of infusing in this step aside (particularly in the absence of IV infusion pumps), the reality is that this step is not utilized. In light of its potential for harm (should any mixing or infusion rate errors occur), and recognizing that this step is not utilized, we recommend its removal.

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**OPTION B:** Administer Dopamine 5 ug/kg/min, IV/Saline Lock drip. If there is insufficient improvement in hemodynamic status, the infusion rate may be increased until desired therapeutic effects are achieved or adverse effects appear. (Maximum dosage is 20 ug/kg/min, IV/Saline Lock drip.)

**OPTION C:** Administer Methylprednisolone 125 mg, IV/Saline Lock bolus, slowly, over 2 minutes.

**OR**

Administer Dexamethasone 12 mg, IV/Saline Lock bolus, slowly over 2 minutes.

**OPTION D:** Transportation Decision.

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\* *If the patient is alert prior to performing Endotracheal Intubation, refer to Prehospital Sedation in General Operating Procedures. Prior Permission from Medical Control Is Required.*

HEAD INJURIES

In patients with head trauma with a Glasgow Coma Scale (GCS) score of 13 or lower

1. Begin Basic Life Support Head and Spine Injuries procedures.
2. Begin an IV infusion of Normal Saline (0.9% NS) to keep vein open, or a Saline Lock.
3. Begin Cardiac Monitoring, record and evaluate EKG rhythm.
4. Perform Endotracheal Intubation\* in patients with a Glasgow Coma Scale score of less than 8, if less invasive methods of airway management are not effective.

5. If a seizure is witnessed:

- a. Administer Lorazepam 2 mg, IV/Saline Lock bolus, or, if IV access is unavailable, IN or IM. A single repeat dose of Lorazepam 2 mg, may be given after 5 minutes if seizure activity persists or recurs.

OR

- b. Administer Diazepam 5 mg, IV/Saline Lock bolus. A single repeat dose of Diazepam 5 mg, IV/Saline Lock bolus, may be given if seizure activity persists or recurs. (Rate of administration may not exceed 5 mg/min.)

OR

- c. Administer Midazolam 10 mg, IM or IN, if IV access is unavailable.

**6. If the Glasgow Coma Scale (GCS) score is less than 8, and active seizures or one or more of the following signs of brain herniation are present, hyperventilate the patient to maintain a continuous end-tidal waveform capnography value between 30-35mmHg.**

- a. – Fixed or asymmetric pupils
- b. – Abnormal flexion or extension (neurologic posturing)
- c. – Hypertension and bradycardia (Cushing's Reflex)
- d. – Intermittent apnea (periodic breathing)
- e. – Further decrease in GCS score of 2 or more points (neurologic deterioration)

7. If seizure activity persists, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

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**MEDICAL CONTROL OPTIONS:**

**OPTION A:** Repeat Lorazepam 2 mg, IV/Saline Lock bolus, or, if IV access is unavailable, IN or IM.

OR

Repeat Diazepam 5 mg, IV/Saline Lock bolus. (Rate of administration may not exceed 5 mg/min.)

OR

Repeat Midazolam 10 mg, IN or IM, if IV access is unavailable.

**OPTION B:** Transportation Decision.

- 
- \* *If the patient is alert prior to performing Endotracheal Intubation, refer to Prehospital Sedation in General Operating Procedures. Prior Permission from Medical Control Is Required.*

**Rationale – 521**

In the face of evidence of increasing intracranial pressure, one accepted measure to offset the intracranial pressure rise is controlled hyperventilation. A reduction of pCO<sub>2</sub> into the 30-35 mmHg range is expected to produce a lowering of the ICP by up to 25% (Cruz J: *Severe acute brain trauma*. In: Cruz J, ed. *Neurologic and Neurosurgical Emergencies*, Philadelphia: Saunders; 1998.) which begins to occur within 30 seconds and peaks by around eight minutes. Given the availability of waveform capnography, this should now be our standard to prevent overshoot (i.e. a patient initially ventilated with a tidal volume of 800cc at 12 breaths per minute whose rate is then increased to 20 breaths per minute, if their pCO<sub>2</sub> was initially normal (40mmHg) would then be expected to experience a pCO<sub>2</sub> of 24mmHg, resulting in intracerebral vasodilation and potential worsening insult).

SEVERE PRE-ECLAMPSIA / ECLAMPSIA

For patients with severe pre-eclampsia, eclampsia ~~or post-partum hemorrhage~~:

**NOTE:** SEVERE PRE-ECLAMPSIA IS CHARACTERIZED BY A SYSTOLIC BLOOD PRESSURE OF 160 mmHg OR HIGHER, A DIASTOLIC BLOOD PRESSURE OF 110 mmHg OR HIGHER, AND/OR SEVERE HEADACHES, VISUAL DISTURBANCES, ACUTE PULMONARY EDEMA, OR UPPER ABDOMINAL TENDERNESS.

1. Begin Basic Life Support Obstetric Emergencies procedures.
2. Begin an IV/Saline Lock infusion of Normal Saline (0.9% NS) to keep vein open, or a Saline Lock.
3. Contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

**MEDICAL CONTROL OPTIONS:**

**OPTION A:** For severe pre-eclampsia or eclampsia, administer Magnesium Sulfate 2 gm, IV/Saline Lock drip, diluted in 50 - 100 ml of Normal Saline (0.9% NS), over 10 - 20 minutes. If seizures develop, continue, or recur in transport, repeat Magnesium Sulfate 2 gm, IV/Saline Lock drip, diluted in 100 ml of Normal Saline (0.9% NS), over 10 - 20 minutes.

~~**OPTION B:** For post-partum hemorrhage, administer Oxytocin 20 mU/min, IV/Saline Lock drip (if available). Prepare infusion by adding 5 U (0.5 mL) of Oxytocin to 250 mL of Normal Saline (0.9% NS) or Ringer's Lactate (RL); using a microdrip administration set (20 mU/min = 60 gtts/min = 1 gtts/sec). If there is insufficient improvement in control of post-partum hemorrhage, the infusion rate may be increased until the desired therapeutic effects are achieved or adverse effects appear. (Maximum dosage is 40 mU/min, IV/Saline Lock drip.)~~

~~Begin rapid IV/Saline Lock infusion of Normal Saline (0.9% NS) or Ringer's Lactate (RL) via one to two large bore (14 – 16) gauge catheters, up to 3 liters, via a macro-drip administration set.~~

~~**NOTE:** DO NOT ADMINISTER OXYTOCIN IF THE PLACENTA HAS NOT BEEN COMPLETELY EXPELLED, OR SIGNS OF PRE-ECLAMPSIA OR ECLAMPSIA ARE PRESENT.~~

~~**FAILURE TO RESPOND TO OXYTOCIN MAY INDICATE THAT PLACENTAL REMNANTS, OR AN UNDELIVERED TWIN, REMAIN WITHIN THE UTERINE CAVITY.**~~

**OPTION B:** Transportation Decision.

**Rationale – Protocol 540**

To date, there has been no evidence presented supporting the need of oxytocin in this protocol. If the removal of this Medical Control Option is not approved, suggesting a perceived need among our patient population, we would suggest a mandated quality assurance reporting to the REMAC so that the rest of the system may more appropriately modify its use / supply of this medication.

PEDIATRIC OBSTRUCTED AIRWAY

For pediatric patients who are unconscious or cannot breathe, cough, speak, or cry:

1. Begin Basic Life Support Pediatric Obstructed Airway procedures.
2. Perform Direct Laryngoscopy. Attempt to remove the foreign body with appropriate size Magill Forceps.

**NOTE: IF AN ENLARGED EPIGLOTTIS IS VISUALIZED, SEE PROTOCOL #552.**

3. Perform Endotracheal Intubation, if less invasive methods of airway management are not effective.
4. ~~Consider Needle Cricothyroidotomy only if all less invasive methods of airway management are not effective.~~

**4. If able to confirm intubation via direct visualization but unable to ventilate:**

- a. Note the endotracheal tube depth
- b. Deflate the endotracheal tube cuff
- c. Advance the endotracheal tube to its deepest depth
- d. Return the endotracheal tube to its original depth
- e. Reinflate the endotracheal tube cuff and attempt ventilation again
- f. If unable to effectively ventilate the patient using the above maneuvers, immediately initiate transport

5. Transportation Decision.

**Rationale – Protocol 551**

**First Issue – Intentional Right Mainstem Displacement**

As you will recall, this language was actually accepted by the REMAC last year but was subsequently rejected by the SEMAC. One of their stated reasons was that this technique had never been described in the literature. Since that time, FDNY paramedics have successfully used this technique to save the life of a child. This case was added to others and has been submitted for publication in the peer-reviewed literature. Failure to use this technique would have resulted in a 20-plus minute anoxic time for this particular three year-old. We believe the value to this technique merits its inclusion in this protocol and resubmission to the SEMAC.

**Second Issue – Removal of Needle Cricothyroidotomy**

One published case series is often used to describe the efficacy of this procedure, with no immediate fatalities reported as a result of this procedure (Patel RG. Percutaneous transtracheal jet ventilation. Chest 1999;116:1689–94. - <http://www.mdconsult.com/das/article/body/159240626-8/jorg=journal&source=MI&sp=11141198&sid=886415344/N/161055/1.html?issn=0012-3692> ) But this series included the use of transtracheal jet ventilation. Low pressure ventilation (i.e. BVM) was initially described in 1909 by Meltzer (Meltzer SJ, Auer J: Continuous respiration without respiratory movement. *J Exp Med* 1909; 11:622.) but reported the success of this procedure in anesthetized dogs for whom the technique allowed for 30 minute survival when the dogs were neither hypoxic nor hypercarbic at the time of the procedure.

The FDNY performed a review of all adult and pediatric patients on whom this procedure was performed. Every patient who was pulseless at the time of the procedure remained pulseless upon ED arrival. Every patient with intact perfusion at the time of procedure progressed to cardiopulmonary arrest prior to ED arrival. No patient in either group survived. We therefore recommend its removal.

PEDIATRIC ASTHMA/WHEEZING

*For pediatric patients with acute asthma and/or active wheezing:*

1. Begin Basic Life Support Pediatric Respiratory Distress/Failure procedures.
2. Administer Albuterol Sulfate 0.083% (one unit dose vial of 3 ml), by nebulizer, at a flow rate that will deliver the solution over 5 – 15 minutes. (Refer to Length Based Dosing Device) May be repeated twice during transport (total of 3 doses).
3. **Administer** Ipratropium Bromide 0.02% (one unit dose vial of 0.5mL in children 6 years of age or older, one half unit dose vial of 0.5mL in children under 6 years of age), by nebulizer, **may-be mixed-with in conjunction with each** Albuterol Sulfate **dose**. (Refer to Length Based Dosing Device)
4. In patients one (1) year of age or older with severe respiratory distress, respiratory failure, and/or decreased breath sounds, administer Epinephrine 0.01 mg/kg (0.01 ml/kg of a 1:1,000 solution), IM. Maximum dose is 0.3 ml. (Refer to Length Based Dosing Device)

**NOTE: SEVERE RESPIRATORY DISTRESS IN A CHILD IS CHARACTERIZED BY MARKEDLY INCREASED RESPIRATORY EFFORT, I.E., SEVERE AGITATION, DYSPNEA, TRIPOD POSITION, AND SUPRASTERNAL AND SUBSTERNAL RETRACTIONS.**

**A SILENT CHEST IS AN OMINOUS SIGN THAT INDICATES RESPIRATORY FAILURE AND ARREST ARE IMMINENT.**

During transport, or if transport is delayed:

4. If the patient develops or remains in severe respiratory distress or respiratory failure, and/or continues to have decreased breath sounds, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

**MEDICAL CONTROL OPTIONS:**

- OPTION A:** Repeat Albuterol Sulfate 0.083% (one unit dose bottle of 3 ml), by nebulizer, at a flow rate that will deliver the solution over 5 to 15 minutes. (Refer to Length Based Dosing Device)
- OPTION C:** Repeat Epinephrine 0.01 mg/kg (0.01 ml/kg of a 1:1,000 solution), IM, 20 minutes after the initial dose. (Refer to Length Based Dosing Device)
- OPTION D:** Begin an IV infusion of Normal Saline (0.9% NS) to keep vein open, or a Saline Lock. Attempt IV no more than twice.
- OPTION E:** Transportation Decision.

**Rationale – Protocol 503A**

We have been told of some confusion among field providers regarding the intent of this protocol. The language change above is meant to reflect the fact that the protocol intends to state that one ipratropium dose be provided with each albuterol dose.

555

PEDIATRIC ANAPHYLACTIC REACTION

1. Begin Basic Life Support Anaphylactic Reaction procedures.
2. If the patient develops signs of respiratory failure, airway obstruction, or decompensated shock:
  - a. Perform Endotracheal Intubation, and
  - b. Administer Epinephrine 0.01 mg/kg (0.1 ml/kg of a 1:10,000 solution), via the Endotracheal Tube. (Refer to Length Based Dosing Device)
3. If Endotracheal Intubation cannot be accomplished, administer Epinephrine 0.01 mg/kg (0.01 ml/kg of 1:1,000 solution), IM. Maximum dose is 0.3 mg (0.3 ml of a 1:1,000 solution.) (Refer to Length Based Dosing Device)

During transport, or if transport is delayed:

4. If abdominal distention occurs, pass a Nasogastric Tube. If unsuccessful, pass an Orogastric Tube.
5. If the patient develops or remains in decompensated shock, contact Medical Control for implementation of one or more of the following MEDICAL CONTROL OPTIONS:

**MEDICAL CONTROL OPTIONS:**

**OPTION A:** Repeat any of the above Standing Orders.

**OPTION B:** Begin an IV or IO infusion of Normal Saline (0.9% NS) via a large bore IV (18-22 gauge) or IO catheter to keep the vein open, or a Saline Lock. Attempt vascular access no more than twice.

**OPTION C:** Begin rapid IV/Saline Lock or IO infusion of Normal Saline (0.9% NS), 20 ml/kg. Repeat as necessary. (Refer to Length Based Dosing Device)

~~**OPTION D:** Administer Epinephrine 0.1 ug/kg/min, IV/Saline Lock or IO drip. Prepare infusion by adding 1 mg of Epinephrine (1 ml of a 1:1,000 solution to 1 liter of Normal Saline (0.9% NS) (0.1 ug/kg/min = 6 ml/kg/hr = 6 gtts/kg/min). If there is insufficient improvement in hemodynamic status, the infusion rate may be increased until the desired therapeutic effects are achieved or adverse effects appear. Maximum dosage is 1.5 ug/kg/min, IV/ Saline Lock or IO drip. (Refer to Length Based Dosing Device)~~

**OPTION E:** Transportation Decision.

**Rationale – Protocol 555**

The difficulties of the preparation and act of infusing in this step aside (particularly in the absence of IV infusion pumps), the reality is that this step is not utilized. In light of its potential for harm (should any mixing or infusion rate errors occur), and recognizing that this step is not utilized, we recommend its removal.