

**Monroe-Livingston Regional EMS  
Protocols**

**Section 8**

**Tox-Medic  
Hazardous Materials Protocols**

## TABLE OF CONTENTS

Special Level of Care Explanation .....	8.0
Cholinesterase Inhibitors .....	8.1
Corrosives .....	8.2
Cyanide .....	8.3
Hydrazines.....	8.4
Hydrocarbons .....	8.5
Hydrofluoric Acid and Fluorides .....	8.6
Irritant Gases .....	8.7
Methemoglobinemia .....	8.8
Ocular Contamination.....	8.9
Tox-Medic Formulary.....	8.10

## **8.0 SPECIAL LEVEL OF CARE EXPLANATION**

### **OVERVIEW**

There are certain situations where additional treatments beyond the scope of the standard MLREMS protocols are beneficial for the patient. Hazardous materials exposures require additional training for patients to be recognized and treated appropriately. This training includes the specific toxidromes most commonly associated with the exposure, antidotes, pharmaceutical interventions, and familiarity with operating in the vicinity of an ongoing hazard.

These protocols are to be used by regionally-credentialed specially trained paramedics under strict physician oversight. It is recognized that these Tox-Medics have primary responsibility to the Hazardous Materials Team operating at an incident, and it is more likely that these Tox-Medics will be required to constantly monitor the occupational hazards incurred by a Hazardous Materials Technician rather than civilians affected by such an exposure. The Tox-Medic must have a close working relationship with responding hazardous materials team in order to be an effective advocate for their health and safety.

### **CREDENTIALING**

The following is required to operate at the MLREMS Tox-Medic level and utilize the protocols contained herein:

1. Certified and cleared at the paramedic level in the Monroe-Livingston Region.
2. Certified in ACLS, PALS/PEPP and ITLS/PHTLS.
3. Successfully completed an approved Hazmat Operations and Advanced HazMat Life Support course.
4. Member of a Hazardous Materials Medical Response Team.
5. Attend a minimum 8 hours per year of Hazmat /Toxmedic specific training.
6. Participate in a minimum of 50% of Hazardous Materials Response Team training drills and one live drill per year.
7. Receive approval from the System Medical Director or his/her designee to participate at such a level.

### **STANDARD OF CARE**

These "Hazardous Materials Protocols" are only to be used by personnel regionally credentialed as Tox-Medics. These protocols are to be used in concert with the EMT-P scope of practice outlined in the MLREMS Standards of Care and are NOT to be used for routine Advanced Life Support care. These protocols are meant to act as general guidelines for rendering medical care and/or treatments and may not be inclusive for every situation. The protocols should be regarded as the prevailing norms of treatment and should be considered prudent in the delivery of medical care. Deviation from these protocols may be necessary based on patient need and must be documented.

## **MEDICAL CONTROL**

The following protocols are considered standing order for credentialed Tox-Medics when operating at the scene of a hazardous materials incident. In these circumstances, all MLREMS EMT-P Standards of Care are also standing order for the Tox-Medic except in cases identified as Absolute On-Line with no exception for radio or phone failure. Any deviation from the Hazardous Material Protocols requires Absolute On-Line Medical Control.

Medical Control for Tox-Medics is provided by the Regional Medical Director On-Call, the Hazmat Team Toxicologist, or Poison Control Center Physician. The Tox-Medic must have a means of direct communication to Medical Control at any time during their care of the patient. In the event of being unable to contact Tox-Medic Medical Control, the Tox-Medic should institute direct contact with standard medical control. In the event of failure of all the above, treatment protocols will be regarded as standing order, however procedures requiring absolute on-line medical command should not be undertaken unless a life threatening emergency.

## 8.1 CHOLINESTERASE INHIBITORS

### CRITERIA

Exposure to cholinesterase inhibitors including nerve agents may result in the following:

Mild Symptoms	Moderate Symptoms	Severe Symptoms
Salivation	Mild symptoms plus:	Moderate symptoms plus:
Lacrimation	Fasciculations	Vomiting
Pinpoint Pupils	Diarrhea	Confusion
Wheezing/Coughing	Difficulty breathing	Unresponsiveness
		Seizures

### TOX-MEDIC

1. Routine Standing Orders.
2. Rapid transport once necessary decontamination completed.
3. Establish intravenous access and cardiac monitoring.
4. Exposures with none of the above symptoms should be given oxygen and observed for signs and symptoms. No antidotes should be administered for asymptomatic patients.
5. **Do not administer Furosemide or morphine.**
6. If exposure and symptoms, administer the following:

#### Mild Symptoms

##### Adult

1 Mark I Kit/ or Atropine 2 mg IV/IM/IO every 5 minutes until secretions resolve  
1 Duodote Kit Pralidoxime 1 g IV/IM/IO over 10 minutes

##### Pediatric

1 Mark I Kit/ or Atropine 0.02 mg/kg IV/IM/IO every 5 minutes until secretions resolve  
1 Duodote Kit Pralidoxime 40 mg/kg IV/IM/IO over 10 minutes

#### Moderate Symptoms

##### Adult

2 Mark I Kits/ or Atropine 4 mg IV/IM/IO every 5 minutes until secretions resolve  
2 Duodote Kits Pralidoxime 2 g IV/IM/IO over 10 minutes

##### Pediatric

2 Mark I Kits/ or Atropine 0.02 mg/kg IV/IM/IO every 5 minutes until secretions resolve  
2 Duodote Kits Pralidoxime 40 mg/kg IV/IM/IO over 10 minutes

#### Severe Symptoms

##### Adult

3 Mark I Kits/ or Atropine 6 mg IV/IM/IO every 5 minutes until secretions resolve  
3 Duodote Kits Pralidoxime 2 g IV/IM/IO over 10 minutes  
1 CANA Diazepam 10 mg IV/IM/IO

##### Pediatric

3 Mark I Kits/ or Atropine 0.04 mg IV/IM/IO every 5 minutes until secretions resolve  
3 Duodote Kits Pralidoxime 40 mg/kg IV/IM/IO over 10 minutes  
1 CANA Diazepam 0.2 mg/kg IV/IM/IO

## 8.2 CORROSIVES

### CRITERIA

1. Inhalation of a corrosive may result in the following signs or symptoms:
  - a. Coughing, burning, or difficulty breathing
  - b. Laryngospasm, bronchospasm, and/or edema of the upper/lower airway
  - c. Dysphonia, throat tightness, hoarseness, stridor, and aphonia
2. Dermal exposure to a corrosive may result in the following signs or symptoms:
  - a. Burn(s)/pain at area of contamination
  - b. Hypovolemia
  - c. Prolonged QT interval, dysrhythmias
  - d. Anxiety, confusion, agitation, seizures, possible decreased level of consciousness
  - e. Liquefactive necrosis of tissue (Alkali burns)
  - f. Coagulative necrosis of tissue (Acid burns)

### TOX-MEDIC

1. Routine Standing Orders.
2. Minimize recumbent position to avoid aspiration risks.
3. Flush all affected skin surfaces with normal saline for at least 15 minutes even after complete decontamination.
4. Establish intravenous access and cardiac monitoring.
5. Provide care directed to the patients symptoms:
  - a. Altered Mental Status – Refer to Altered Mental Status Protocol
  - b. Dysrhythmias – Refer to relevant Dysrhythmia protocol
  - c. Hypotension – Refer to Hypotension/Shock Protocol
  - d. Nausea/Vomiting
    - i. **Avoid Promethazine**
  - e. Pulmonary Edema
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP
    - ii. **Do not administer Furosemide or nitroglycerin**
  - f. Respiratory Distress/Bronchospasm
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP
    - ii. Albuterol 5.0 mg by nebulizer. May give via bag-valve mask or CPAP if necessary. May repeat up to 30 mg/hr.
    - iii. Ipratropium Bromide (Atrovent) 0.5 mg by nebulizer. May mix with Albuterol to give simultaneously, may not repeat.
  - g. Seizures
    - i. Administer 5 mg diazepam IV/IO, may repeat as needed.
6. If ocular irritation present refer to Ocular Contamination Protocol.

## 8.3 CYANIDE

### CRITERIA

1. Known or suspected exposure to cyanogenic compound.
2. Signs and symptoms including any of the following:
  - a. Tachypnea
  - b. Tachycardia
  - c. Central and peripheral cyanosis
  - d. Throbbing headache
  - e. Hypotension
  - f. Syncope
  - g. Weakness
  - h. Agitation
  - i. Seizures

### TOX-MEDIC

1. Routine Standing Orders.
2. Rapid transport once necessary decontamination completed. Transport patients who have ingested cyanide salts in vehicles with windows open and/or good ventilation.
3. Establish intravenous access and cardiac monitoring.
4. Mild exposures with conscious and alert patients should be given oxygen and observed for signs and symptoms. No antidotes should be administered for mild exposure.
5. If patient is exhibiting life-threatening symptoms (severe respiratory compromise or arrest, shock, seizures, coma) and there is no concomitant CO exposure:
  - a. Determine and treat blood glucose as appropriate.
  - b. Administer 300 mg of 3% Sodium Nitrite diluted in 100 mL of Normal Saline and given IV/IO over 5 minutes. Decrease infusion rate if hypotension develops.
  - c. Administer 12.5 gm Sodium Thiosulfate IV/IO over 10 minutes.
  - d. If adequate ventilation has been established, administer Sodium Bicarbonate 1 mEq/kg IV/IO.
  - e. One half the dose of Sodium Nitrite and Sodium Thiosulfate may be repeated if adequate clinical response has not occurred in 30 minutes.
6. Provide supportive care directed to the patients symptoms:
  - a. Hypotension – Refer to Hypotension/Shock Protocol
  - b. Seizures
    - i. Administer 5 mg diazepam IV/IO, may repeat as needed
7. If ocular irritation present refer to Ocular Contamination Protocol.

## 8.4 HYDRAZINES

### CRITERIA

1. Respiratory signs and symptoms secondary to known or suspected hydrazine exposure:
  - a. Burning sensation
  - b. Upper airway edema, coughing, dysphonia, stridor, laryngospasm
  - c. Wheezing/rales
  - d. Tachypnea
2. Presentation can also include:
  - a. Tachydysrhythmias
  - b. Chest pain
  - c. Ischemic changes (inverted T waves and/or ST segment depression/elevation)
  - d. Seizures
  - e. Coma
  - f. Hematemesis
  - g. Abdominal pain, nausea, and vomiting

### TOX-MEDIC

1. Routine Standing Orders.
2. Minimize recumbent position to avoid aspiration risks.
3. Establish intravenous access and cardiac monitoring.
4. Provide care directed to the patients symptoms:
  - a. Altered Mental Status – Refer to Altered Mental Status Protocol
  - b. Chest Pain – Refer to Chest Pain Protocol
  - c. Dysrhythmias – Refer to relevant Dysrhythmia protocol
  - d. Hypotension – Refer to Hypotension/Shock Protocol
  - e. Pulmonary Edema
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP.
    - ii. **Do not administer Furosemide or nitroglycerin.**
  - f. Respiratory Distress/Bronchospasm
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP
    - ii. Albuterol 5.0 mg by oxygen powered nebulizer. May give via bag-valve mask or CPAP if necessary. May repeat up to 30 mg/hr.
    - iii. Ipratropium Bromide (Atrovent) 0.5 mg by nebulizer. May mix with Albuterol to give simultaneously, may not repeat.
  - g. Seizures
    - i. Administer 5 mg diazepam IV/IO, may repeat as needed.
5. If ocular irritation present refer to Ocular Contamination Protocol.

## 8.5 HYDROCARBONS

### CRITERIA

1. Known exposure to hydrocarbons.
2. Signs and symptoms including any of the following:
  - a. CNS – Confusion, combativeness, decreased level of consciousness, seizures
  - b. G.I. – Nausea, vomiting
  - c. Cardiac – Dysrhythmias
  - d. Pulmonary – Pulmonary edema, wheezing, rhonchi
  - e. Dermatologic – Dermatitis and burns

### TOX-MEDIC

1. Routine Standing Orders.
2. Minimize recumbent position to avoid aspiration risks.
3. Establish intravenous access and cardiac monitoring.
4. Provide care directed to the patients symptoms:
  - a. Altered Mental Status – Refer to Altered Mental Status Protocol
  - b. Dysrhythmias
    - i. **Avoid epinephrine**
    - ii. Refer to relevant Dysrhythmia protocol
  - c. Hypotension – Refer to Hypotension/Shock Protocol
  - d. Nausea/Vomiting
    - i. **Avoid Promethazine**
  - e. Pulmonary Edema
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP
    - ii. **Do not administer Furosemide, albuterol, or nitroglycerin**
  - f. Respiratory Distress/Bronchospasm
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP
    - ii. **Do not administer albuterol or epinephrine**
  - g. Seizures – Refer to Seizures Protocol
    - i. Administer 5 mg diazepam IV/IO, may repeat as needed.
5. If ocular irritation present refer to Ocular Contamination Protocol.

## 8.6 HYDROFLUORIC ACID AND FLUORIDES

### CRITERIA

Exposure to hydrofluoric acid or fluorides may result in any of the following:

- |                                    |                      |
|------------------------------------|----------------------|
| a. Coughing                        | g. Wheezes/rales     |
| b. Burning                         | h. Hypovolemia       |
| c. Dyspnea                         | i. Tachydysrhythmias |
| d. Bronchospasm                    | j. Ischemic changes  |
| e. Laryngospasm                    | k. Pain at burn site |
| f. Edema of upper and lower airway |                      |

### TOX-MEDIC

1. Routine Standing Orders.
2. Flush all affected skin surfaces with large quantities of water and a mild liquid detergent for at least 15 minutes even after complete decontamination.
3. Rapid transport once necessary decontamination completed.
4. Establish intravenous access and cardiac monitoring.
5. If hypotensive, refer to Hypotension/Shock protocol.
6. Place patient on cardiac monitor and monitor for dysrhythmias, if they occur treat per protocol.
7. If Hydrofluoric Acid burns to skin:

Apply Calcium Gluconate 2.5% gel liberally to affected skin surfaces and cover with occlusive dressing. Do not place in eyes.
8. If Hydrofluoric Acid to eye:

Follow Ocular Contamination Protocol, however instead of Normal Saline, irrigate with 1% Calcium Gluconate Solution (50 mL 10% Calcium Gluconate in 500 mL NS). Repeat indefinitely.
9. If Hydrofluoric Acid inhalation:

Nebulize 1 mL 10% Calcium Gluconate mixed with 3 mL NS. Repeat indefinitely.
10. Administer Morphine Sulfate 5 mg IV/IO every 10 minutes as needed for pain >4/10.

## 8.7 IRRITANT GASES

### CRITERIA

Respiratory signs and symptoms secondary to known or suspected irritant gas exposure:

1. Burning sensation
2. Upper airway edema, coughing, stridor, laryngospasm, dysphonia or aphonia
3. Wheezing/rales
4. Tachypnea

### TOX-MEDIC

1. Routine Standing Orders.
2. Establish intravenous access and cardiac monitoring.
3. Provide care directed to the patients symptoms:
  - a. Pulmonary Edema/CHF
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP
    - ii. **Do not administer Furosemide or nitroglycerin.**
  - b. Respiratory Distress/Bronchospasm
    - i. Provide adequate oxygenation and ventilation with bag valve mask or CPAP
    - ii. Albuterol 5.0 mg by oxygen powered nebulizer. May give via bag-valve mask or CPAP if necessary. May repeat up to 30 mg/hr.
    - iii. Ipratropium Bromide (Atrovent) 0.5 mg by nebulizer. May mix with Albuterol to give simultaneously, may not repeat.
  - c. Seizures
    - ii. Administer 5 mg diazepam IV/IO, may repeat as needed
4. If chlorine or hydrochloric acid inhalation and significant respiratory distress, administer Sodium Bicarbonate via nebulizer (3 ml of 8.4% NaHCO<sub>3</sub> and 3 ml of normal saline). May repeat indefinitely.
5. If ocular irritation present refer to Ocular Contamination Protocol.

## 8.8 METHEMOGLOBINEMIA

### CRITERIA

The Methemoglobinemia treatment protocol should be instituted when **all** of the four criteria are met:

1. Known or suspected exposure to oxidizing agents (nitrates, nitrites, chlorates, etc) including:
  - a. Amyl Nitrate
  - b. Aniline Dye Derivatives (Shoe Dyes, Marking Inks)
  - c. Butyl Nitrite
  - d. Chlorobenzene
  - e. Isobutyl Nitrite
  - f. Naphthaline
  - g. Nitrophenol
  - h. Nitrous Gases
  - i. Sodium Nitrite
2. Central or peripheral cyanosis.
3. Signs and symptoms of significant (>20%) methemoglobinemia:
  - a. Dyspnea
  - b. Chest Pain
  - c. Agitation
  - d. Confusion
  - e. Seizures
  - f. Coma
4. Chocolate-brown-colored blood viewed in flash chamber when starting IV.

A history of Glucose-6-Phosphate Dehydrogenase Deficiency (G6PD) is an **absolute contraindication** to Methylene Blue Administration.

### TOX-MEDIC

1. Routine Standing Orders.
2. Rapid transport once necessary decontamination completed.
3. Establish intravenous access and cardiac monitoring.
4. Administer 2 mg/kg 1% Methylene Blue slow IV/IO over 5 minutes followed by a minimum 50 mL normal saline. May repeat once in 30 minutes if no response and symptoms persist.
5. Provide care directed to the patients symptoms:
  - a. Altered Mental Status – Refer to Altered Mental Status Protocol
  - b. Dysrhythmias – Refer to relevant Dysrhythmia protocol
  - c. Hypotension – Refer to Hypotension/Shock Protocol
  - d. Seizures
    - i. Administer 5 mg diazepam IV/IO, may repeat as needed
6. If ocular irritation present refer to Ocular Contamination Protocol.

## **8.9 OCULAR CONTAMINATION**

### **SCOPE OF PRACTICE**

Placement of a Morgan Lens may be performed by any Tox-Medic and any level provider who has been trained and approved by the agency medical director on the indications, insertion, and use of the device. A recurrent training program is required for all providers eligible to insert the Morgan Lens in order to maintain skills competency. Once placed, the Morgan Lens may be maintained by any EMT-P level provider, with preference to a Tox-Medic.

### **CRITERIA**

#### **Indication**

Chemical exposure to the eye

#### **Contraindications**

Ocular foreign body  
Penetrating eye injury  
Unable to remove contact lens  
Allergy to "caine" anesthetics

### **PROCEDURE**

1. Ensure contact lenses are removed prior to treatment.
2. Instill 2 drops of Tetracaine Ophthalmic solution to the affected eye(s).
3. Insert Morgan Lens in affected eye(s) with Normal Saline flowing (Do NOT insert a dry Morgan Lens)
4. Continuously flush eye(s) with Normal Saline for at least 20 minutes.
5. Tetracaine may be repeated once for patient comfort.
6. The Morgan Lens may only be removed with a Medical Control order.
7. A 1% solution of Calcium Gluconate may be used in lieu of Normal Saline for ocular Hydrofluoric Acid burns.

## 8.10 TOX-MEDIC FORMULARY

### I. Atropine Sulfate

#### a. Indications

- i. Organophosphate or carbamate exposure with the following symptoms :

#### Mild Symptoms

Salivation  
Lacrimation  
Pinpoint Pupils  
Wheezing/Coughing

#### Moderate Symptoms

Mild symptoms plus:  
Fasciculations  
Diarrhea  
Difficulty breathing

#### Severe Symptoms

Moderate symptoms plus:  
Vomiting  
Confusion  
Unresponsiveness  
Seizures

#### b. Contraindications

- i. Absolute
  1. None
- ii. Relative
  1. Third degree heart block

#### c. Complications and Adverse Effects

- i. Dry mouth
- ii. Tachycardia

#### d. Dosage and Route

- i. Administer repeated doses (no maximum) until secretions resolve :
  1. Adult
    - a. 2-6 mg IV/IO (initial and subsequent doses)
  2. Pediatric
    - a. 0.04 mg/kg, minimum of 0.1 mg, IV/IO (initial and subsequent doses)

#### e. How Supplied

- i. 1 mg prefilled syringe
- ii. 2 mg prefilled autoinjector
- iii. 8 mg/20 mL multidose vial

## II. Calcium Gluconate

- a. Indications
  - i. Ocular, dermal, or airway burns due to Hydrofluoric Acid
- b. Contraindications
  - i. Absolute
    - 1. Digoxin Toxicity (only when given IV, no contraindication when topical)
  - ii. Relative
    - 1. Hypercalcemia
- c. Complications and Adverse Effects
  - i. Hypercalcemia
  - ii. Irritation and pain at burn sites
- d. Dosage and Route
  - i. Adult and Pediatric
    - 1. Topical
      - a. Apply Calcium Gluconate 2.5% gel liberally to affected skin surfaces but NOT in eyes.
        - i. May mix 10 mL 10% Calcium Gluconate with 2 oz of KY jelly to make 2.5% gel.
        - ii. May place 10 mL 10% Calcium Gluconate inside surgical glove and apply for hand/finger burns.
    - 2. Ocular
      - a. Irrigate with 1% Calcium Gluconate Solution
        - i. Mix 50 mL 10% Calcium Gluconate in 500 mL NS.
        - ii. Repeat indefinitely.
    - 3. Inhalational
      - a. Nebulize 1 mL 10% Calcium Gluconate mixed with 3 mL NS.
      - b. Repeat indefinitely.
- e. How Supplied
  - i. 1 gram 10% Calcium Gluconate 10 mL vial

### III. Methylene Blue

- a. Indications
  - i. Severe methemoglobinemia
- b. Contraindications
  - i. Absolute
    - 1. Glucose-6-Phosphate Dehydrogenase Deficiency (G6PD)
    - 2. Allergy
  - ii. Relative
    - 1. Known methemoglobin reductase deficiency
    - 2. Severe renal failure
    - 3. Cyanide poisoning
    - 4. Cardiac arrest
- c. Complications and Adverse Effects
  - i. Nausea
  - ii. Vomiting
  - iii. Headache
  - iv. Blue-green urine
  - v. Hemolysis
- d. Dosage and Route
  - i. Adult and Pediatric
    - 1. 2 mg/kg IV/IO over 5 minutes followed by a minimum of 50 mL normal saline
    - 2. May repeat once in 30 minutes if no improvement.
- e. How Supplied
  - i. 10 mg/1mL (1%) solution in 10 mL ampule

#### **IV. Pralidoxime**

- a. Indications
  - i. Organophosphate pesticide or unknown cholinesterase inhibitor poisoning with symptoms.
- b. Contraindications
  - i. Absolute
    - 1. None
  - ii. Relative
    - 1. Inability to establish airway
    - 2. Myasthenia Gravis
    - 3. Renal Failure
- c. Complications and Adverse Effects
  - i. Neuromuscular blockade resulting in laryngospasm, muscular rigidity and tachycardia
  - ii. Nausea
  - iii. Blurred vision
  - iv. Headache
- d. Dosage and Route
  - i. Adult
    - 1. 1-2 grams IV/IO over 10 minutes
  - ii. Pediatric
    - 1. 40 mg/kg IV/IO over 10 minutes
- e. How Supplied
  - i. 1 gm / 20 mL ampoule
  - ii. 600 mg pre-filled autoinjector

## V. Sodium Nitrite

- a. Indications
  - i. Severe respiratory compromise, shock, seizures, coma or arrest after exposure to cyanogenic compound.
- b. Contraindications
  - i. Absolute
    - 1. Allergy
  - ii. Relative
    - 1. Significant hypotension
    - 2. Methemoglobinemia > 40%
    - 3. Carbon Monoxide poisoning
- c. Complications and Adverse Effects
  - i. Hypotension
  - ii. Headache
- d. Dosage and Route
  - i. Adult
    - 1. 300 mg of 3% Sodium Nitrite (10 mL) diluted in 100 mL of Normal Saline and given IV/IO over 5 minutes.
    - 2. May repeat once in 20 minutes if no improvement with 150 mg of 3% Sodium Nitrite diluted in 100 mL of Normal Saline and given IV/IO over 5 minutes.
    - 3. Must be given in conjunction with Sodium Thiosulfate.
  - ii. Pediatric
    - 1. 0.33 mL/kg of 3% Sodium Nitrite (max 10 mL) diluted in 100 mL of Normal Saline and given IV/IO over 5 minutes.
    - 2. May repeat once in 20 minutes if no improvement with 0.16 mg of 3% Sodium Nitrite (max 10 mL) diluted in 100 mL of Normal Saline and given IV/IO over 5 minutes.
    - 3. Must be given in conjunction with Sodium Thiosulfate.
- e. How Supplied
  - i. 300 mg in 10 mL (3%) ampoule

## VI. Sodium Thiosulfate

- a. Indications
  - i. Severe respiratory compromise, shock, seizures, coma or arrest after exposure to cyanogenic compound.
- b. Contraindications
  - i. Absolute
    - 1. None
  - ii. Relative
    - 1. None
- c. Complications and Adverse Effects
  - i. Nausea
  - ii. Vomiting
  - iii. Pain at injection site
- d. Dosage and Route
  - i. Adult
    - 1. 12.5 grams IV/IO over 10 minutes
    - 2. May repeat once in 20 minutes if no improvement with 6.25 gm over 10 minutes.
    - 3. Must be given after sodium nitrite.
  - ii. Pediatric
    - 1. 1.6 mL/kg IV/IO over 10 minutes
    - 2. May repeat once in 20 minutes if no improvement with 0.8 mL/kg over 10 minutes.
    - 3. Must be given after sodium nitrite.
- e. How Supplied
  - i. 12.5 gm in 50 mL ampule

## **VII. Tetracaine**

- a. Indications
  - i. Temporary topical anesthesia prior to Morgan Lens insertion.
- b. Contraindications
  - i. Absolute
    - 1. Allergy
  - ii. Relative
    - 1. None
- c. Complications and Adverse Effects
  - i. Burning sensation
- d. Dosage and Route
  - i. Adult or Pediatric
    - 1. 2 drops to the affected eye(s). May repeat once.
- e. How Supplied
  - i. 0.5% solution in 2 mL dropper bottle