Florida State Emergency Response Commission

Sub-Committee on Training (SOT)

HAZARDOUS MATERIALS MEDICAL TREATMENT PROTOCOLS

Version 3.3

TOXIDROMES

Toxidromes are clinical syndromes that the patient presents with. These patterns of signs and symptoms are essential for the successful recognition of chemical exposure. The toxidromes identified in this protocol are chemical exposure based while others such as the opioids are found within general medical protocol. These chemical toxidromes are identified clinically into five syndromes:

Irritant Gas Toxidrome

Asphyxiant Toxidrome

Corrosive Toxidrome

Hydrocarbon and Halogenated Hydrocarbons Toxidrome

Cholinergic Toxidrome

Each can present as a clinical manifestation of the chemical/poisoning involved with some cross-over between toxidromes. This list combines the toxic syndromes found within NFPA 473 (A.5.4.1(2) and traditional syndromes.

Toxidrome Correlation to NFPA Standard 473 and Traditional Syndromes

Toxidrome	NFPA 473 A.5.4.1(2) Correlation	Hazardous Materials Protocol
Irritant Gas	(j) Irritants	Bronchospasm OC Pepper spray & lacrimants
Asphyxiant	(c) Chemical asphyxiants (d) Simple asphyxiants (h) Blood Agents (n) Nitrogen Compounds	Carbon Monoxide Aniline dyes, Nitriles, Nitrares Cyanide & Hydrogen Sulfide Closed Space Fires Simple Asphyxants
Corrosive	(a) Corrosives (g) Vesicants	Hydrofluroic Acid Chemical burns to the eye Choramine and Chlorine
Hydrocarbon and Halogenated Hydrocarbons	(e) Organic solvents (q) Phenolic Compounds	Phenol Halogenated Hydrocarbons
Cholinergic	(b) Pesticides (f) Nerve Agents	Organophosphate & Carbamate
Opioids	(o) Opiate Compounds	

General Symptomology Correlation to Toxidrome

HazMat Toxidrome	General Symptomology	General Examples
Irritant Gas Syndrome (see Corrosive syndrome)	Irritation to mucus membranes Bronchospasm Non-cardigenic PE	Ammonia Formaldehyde Chlorine Phosgene
Asphyxiant Syndrome	Hypoxemia CNS & CVS effects	Carbon Monoxide Methemoglobin forming Cyanides Sulfides Azides
Corrosive Syndrome	Chemical burns Coagulative necrosis Liquefactive necrosis	Acids Acetic Acid Nitric Acid Hydrochloric Acid Bases Potassium hydroxide Sodium hydroxide
Hydrocarbon & Halogenated HC	Hypoxemia CNS & CVS effects	Methane Butane Hexane Turpentine Toluene
Cholinergic Syndrome	Muscarinic Effects DUMBELS Nicotinic Effects Tachycardia, Weakness, Hypertension, Fasciulations	Malathion Parathion Chlorpyrifos Aldicarb Propxur

ALS MEDICAL CARE PROTOCOLS

The following specific treatment protocols are approved for use during the treatment of the victim of chemical exposure.

1. General Care of the Hazardous Materials Patient
2. Carbon Monoxide Poisoning
3. Aniline Dyes, Nitrites, Nitrates, Nitrobenzene, & Nitrogen Dioxide
4. Cyanide & Hydrogen Sulfide
5. Closed Space Fire (Products of combustion)
6. Organophosphate Insecticide Poisoning & Carbamate Poisoning
7. Hydrofluoric Acid Burns & Poisoning
8. Phenol
9. Chemical Burns To The Eye
10. Bronchospasm Secondary To Toxic Inhalation
11. Tachydysrhythmias
12. Chloramine & Chlorine
13. OC (Oleoresin Capsicum) Pepper Spray & Other Lacrimators
14. Halogenated Hydrocarbons
15. Simple Asphyxants

General Hazardous Materials Treatment

1

Protocol No.

Example Materials

Responder self-protection is a paramount of importance when dealing with hazardous materials. The hazards of the materials involved need to be identified and a well developed risk assessment must be made by qualified hazardous materials technicians.

During the initial stages of the event and prior to the arrival of HazMat Technicians, the EMS responder needs to review and follow the recommendations of the North American Emergency Response Guide Book (NAERG) and their agencies policies and procedures. If the material involved cannot be readily identified, then follow the recommendations of the first guidepage in the NAERG, guide page # 111, until more definitive information can be found.

Any attempts to rescue a victim from a hazardous environment needs to be based upon a risk/benefit analysis. The size-up of the scene, likelihood of victim survival, likelihood of success and the protective abilities the responder's personal protective equipment (PPE) all must be assessed prior to implementing any such rescue attempts. The NAERG provides guidance with regarding PPE capabilities and limitations during "quick in and out" life saving rescues and should be consulted.

Responders need to value the difference between "exposure" and "contamination". Not all exposures result in a contaminate patient. Physical state of the product, location of the patient with regards to the release and direct contact with the product all play in determining possibly of contamination.

In addition to the patient care discussed below, protection of downstream medical facilities from contamination must be considered. Early notification of receiving facilities and field decontamination are essential.

- **Request Hazardous Material Team and Toxmedic and/or HazMat Medic assistance early**.
- **Self-protection of personnel.** Follow PPE recommendations of the NAERG until further hazard/risk assessment can be performed by qualified technicians.
- **MCI incidents follow S.T.A.R.T. Traige**

- **Prevent further exposure of the patient.** Rapidly remove viable victims from hazardous environment.

- **Provide supportive (BLS) care only once safe to do so.**
  - Maintain Airway and provide supplemental oxygen PRN

- **Decontaminate as deemed necessary**
  - Remove contaminated clothing
  - Victims exposed only to gases an vapors present little risk of secondary contamination/exposure once clothing is removed.
  - If exposed to corrosive gases and vapors (Chlorine, ammonia, HCL, ect.) then flush with water.
  - Flush with water for contamination by liquids and solids.
  - Stable, non-life threatening patients who are contaminated by liquids and solids that are not readily water soluble should be provided secondary decontamination in the field.

- **Provide Supportive ALS Care (all paramedics)**
  - Provide supplemental oxygen by appropriate means and rate(supplemental oxygen contraindicated in diprydil poisoning such as paraquat and diquat) seek guidance of supervising physician or poison control center
  - Establish vascular access IV/IO when appropriate
  - Initiate cardiac monitoring, treat dsyrhythmias PRN in accordance Section 2 “Cardiac arrest” and Section 3 “Cardiopulmonary Emergencies” protocols
  - Monitor oxygen saturation and if available carboxyhemoglobin and methemoglobin levels
  - Proceed to “Acid, Alkali and Respiratory Irritant Protocol” H-2 (Yellow) as appropriate
  - Proceed to “Cholinesterase Crisis Protocol” H-5 (Green) for suspected nerve agent, organophosphate or carbamate pesticide poisoning (Mark I autoinjectors are authorized for suspected nerve agent exposure in accordance with the technical protocol for Mark I Autoinjectors
  - If patient is seizing, administer **midazolam (versed)** 0.05 mg/kg slow IV/IO/IN bolus maximum dose 5 mg) titrated to cessation of seizure activity. Repeat once prn. (Refer to Seizure-Adult Protocol 5.7).
  - **10 mg/IM Valium autoinjectors** are authorized for the mass casualty incidents involving 5 or more patients with seizures
  - Treat hypotension by appropriate means

- **Consider contacting Poison Information Center at 1 – 800 – 222 – 1222 for further information and guidance**

- **Provide ALS Material Specific Care (HazMat Medic)**

  - If applicable, follow protocol at the ToxMedic or HazMatMedic Level based upon the material involved

Carbon Monoxide Poisoning

2

Protocol No.

Example Materials

Note: Usually symptoms can begin in the 10 to 20% range, including nausea and headache. It is difficult to correlate a level of carboxyhemoglobin with unconsciousness, because the presence of other gases and the lack of oxygen are all involved. Other medical conditions also impact how the exposure presents. Serious neurologic and cardiac toxicity has been seen at levels in the 30% to 40% range. Unconsciousness in the setting of smoke inhalation is probably due to mixed exposures including cyanide, carbon monoxide, and acid gases as well as many other toxic products of combustion, consider use of closed space fire protocol. In the prehospital settings, rely on clinical features to make recommendations for treatment.

DESCRIPTION: Colorless, odorless, tasteless, non-irritating gas. Converts hemoglobin into carboxyhemoglobin, a non-oxygen carrying compound causing chemical asphyxiation. Pulse oximetry can indicate an incorrect, false high oxygen saturation. Pulse oximetry should be obtained with a device that has the ability to read carboxyhemoglobin and methemoglobin. Units that do not have this capability may give falsely high PaO_2 readings

TREATMENT:

a) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen
b) Preferably endotracheal intubation and monitor End Tidal CO_2 ($ETCO_2$)
c) Start IV 1000cc Normal Saline, age appropriate maintenance rate
d) Treat unconscious patients per the General Medical Considerations Protocol in the Standing Medical Protocols to include evaluation of Glucose levels, correction of hypoglycemia, administration of naloxone (Narcan), and administration of thiamine.
e) Patients should be transported to the closest appropriate medical facility maintain the “golden hour”.

Methemoglobin Formers 3

Protocol No.

Example Materials

- Aniline dyes, nitrites, nitrates, nitrobenzene & nitrogen dioxide

DESCRIPTION: Commonly found in fertilizers, paints, inks, and dyes. Changes hemoglobin into a non-oxygen carrying compound, methemoglobin. Blood color changes from red to a chocolate brown. Pulse oximetry will indicate an inaccurately low reading due to the opaqueness of the compound. Pulse oximetry should be obtained with a device that has the ability to read carboxyhemaglobin and methemaglobin levels

TREATMENT:

a) Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen
b) Preferably endotracheal intubation and monitor End Tidal CO_2 ($ETCO_2$)
c) Start IV of 1000cc normal saline, age appropriate maintenance rate.
d) If hypotensive, position patient, increase IV flow, if unresponsive (Systolic BP less than 90 mm Hg) consider Dopamine.
e) If symptomatic and no clinical suspicion of exposure to carbon monoxide and/or cyanide poisoning, then:
    i. Administer methylene blue, 1 to 2mg / kg IVP over 5 minutes. (methylene blue may momentarily effect the pulse oximeter because of the opaqueness of the drug)

Cyanide Poisoning 4

Protocol No.

Example Materials

- Hydrogen cyanide, cyanogen chloride, potassium cyanide, sodium cyanide

DESCRIPTION: CYANIDE is one of the most rapidly acting poisons. It is reported to smell like “bitter almonds” to those that are genetically capable of detecting the odor. Pulse oximetry will accurately indicate an unusually high saturation due to the cell’s inability to pick up oxygen from the blood stream.

TREATMENT:

Lilly Kit or Pasadena Kit for cyanide or hydrogen sulfide

a) Amyl nitrite pearls— Broken and held on a gauze pad under the patient’s nose. Allow the patient to inhale the material for 15 to 30 seconds of every minute. During the interval during which the patient is not inhaling the amyl nitrate, 100% oxygen should be administered. If the patient is not breathing, place the “pearls” into a BVM and ventilate the patient. (amyl nitrite pearls convert 3%-5% of the hemoglobin to methemoglobin)
Note: This is a temporizing measure only, with the most effective antidotes being given IV. The amyl nitrite step may be bypassed once IV access is obtained Do not allow this to delay IV access.

b) If intubated provide PPV utilizing a BVM

c) As soon as possible start an IV of normal saline and immediately give:
   i) Sodium nitrite 10ml of a 3% solution IV over 2 minutes (300mg). Monitor BP, as hypotension may occur. (sodium nitrite converts approximately 20% of the circulating hemoglobin to methemoglobin). Additional doses of sodium nitrite should only be done once methemoglobin blood analysis is completed.
   ii) Children— Administer 0.33 ml / kg of a 3% solution over 10 minutes.
   iii) Sodium thiosulfate 50 ml of a 25% solution over 10 minutes. Monitor BP
   iv) Children— Administer 1.65 ml / kg up to 50 ml over 10 minutes.

d) Administer 100% (NRBM) oxygen after administering Sodium Nitrite.

Note: Do not administer sodium nitrite in cases involving smoke inhalation (structure fires) or carbon monoxide poisoning. Administer only sodium thiosulfate and 100% oxygen.

OR

Hydroxocobalamin (CyanoKit) 5 grams over 15 - 120 minutes.

a) Start a dedicated IV line.
b) Reconstitute each 2.5 gram vial with 100 ml sodium chloride.
c) Adminster 5 grams (both vials in the kit) at 15 ml/min.

Note for ingested or absorbed cyanide additional doses of hydroxocolbalamine may be required and may be infused at a rate of 5 grams over 15 to 120 minutes.

Hydrogen Sulfide

5

Protocol No.

Example Materials

- Hydrogen sulfide, thioethers

DESCRIPTION: With much the same clinical effects as cyanide, it is a rapid acting poison. Also known as Sewer Gas. It has a distinctive smell of rotten eggs, but may quickly exceed its odor threshold losing its warning properties. Formed naturally by the decomposition of organic substances. Heavier than air. Interferes with cellular respiration.

It has a distinctive smell of rotten eggs, but may quickly exceed its odor threshold losing its warning properties. Formed naturally by the decomposition of organic substances. Heavier than air. Interferes with cellular respiration.

TREATMENT:

Lilly Kit or Pasadena Kit for cyanide or hydrogen sulfide

a) Amyl nitrite Pearls— Broken and held on a gauze pad under the patient's nose. Allow the patient to inhale the material for 15 to 30 seconds of every minute. During the interval during which the patient is not inhaling the amyl nitrate, 100% oxygen should be administered. If the patient is not breathing, place the "pearls" into a BVM and ventilate the patient. (amyl nitrite pearls convert 3%-5% of the hemoglobin to methemoglobin)
Note: This is a temporizing measure only, with the most effective antidotes being given IV. The amyl nitrite step may be bypassed once IV access is obtained Do not allow this to delay IV access.

b) If intubated provide PPV utilizing a BVM

c) As soon as possible start an IV of normal saline and immediately give:
   i) Sodium nitrite 10ml of a 3% solution IV over 2 minutes (300mg). Monitor BP, as hypotension may occur. (sodium nitrite converts approximately 20% of the circulating hemoglobin to methemoglobin). Additional doses of sodium nitrite should only be done once methemoglobin blood analysis is completed.
   ii) Children— Administer 0.33 ml / kg of a 3% solution over 10 minutes.

Closed Space Fire
(Smoke Inhalation)

6

Protocol No.

Example Materials

DESCRIPTION: Closed space fires produce many toxic substances, including cyanide, carbon monoxide, and numerous respiratory irritating gases. CYANIDE is one of the most rapidly acting poisons which can be found in the productions of combustion. Increasingly, cyanide has been recognized as a threat at the scene of a closed space fire and hazardous materials incidents. CO in combination with Cyanide rapidly removes the ability of the blood to transport oxygen. This combined with the severe swelling of the bronchioles and bronchospasms related to the exposure to respiratory irritants creates a patient that will rapidly decompensate

The mechanism of injury during a fire is three fold, Thermal damage, pulmonary irritation, and chemical asphyxiation (HCN, CO).

Anyone exposed from a close space fire should be considered to have inhalation chemical asphyxiation.

TREATMENT:

a. Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen.
b. Preferably, perform endotracheal intubation and monitor end tidal CO_2 ($ETCO_2$).
c. Start IV of 1000 cc normal saline, age appropriate maintenance rate.
d. Treat unconscious patients per the General Medical Considerations Protocol in the Standing Medical Protocols by evaluating glucose levels, correcting hypoglycemia, administering naloxone (Narcan ®) and administering thiamine. As called for by local medical protocols.
e. Hydroxocobalamin (CyanoKit) 5 grams
    a. Start a dedicated IV line
    b. Reconstitute each 2.5 gram vial with 100 ml sodium chloride
    c. Invert or rock the vial. Do not shake.
    d. Adminster 5 grams (both vials in the kit) at 15 ml/min.
    e. Repeat doses can be adminisitered over 15 – 120 minutes
f. If hydroxocobalamin is not available, then give sodium thiosulfate 50ml of a 25% solution. Monitor BP.

Organophosphate and Carbamate Insecticides

7

Protocol No.

Example Materials

- Malathion, parathion, ethion, bendiocarb, aldicarb, sarin nerve agent, VX nerve agent

DESCRIPTION: Pesticide can be inhaled, ingested, or absorbed. Once in the body, it binds with the acetylcholinesterase, initially causing excitation of nervous conduction then paralysis. These agents can be lethal in a dose less than 5 mg. Common seen signs are:

Signs of Organophosphate & Nerve Agents	
D – Diarrhea	**S** – Salivation
U – Urination	**L** – Lacrimation
M – Miosis	**U** – Urination
B – Bronchospasm, bradycardia, bronchorrhea	**D** – Diarrhea
E – Emesis	**G** – Gastro-intestinal pain & hyperactivity
L – Lacrimation	**E** – Emesis
S – Salivation	**M** – Miosis (Pinpoint pupils)

NOTE: not all pesticides are considered organophosphates or carbamates. In addition, Carbamates tend to be less severe and self limiting and may require less aggressive treatment. Atropine should be titrated to clinical effect.

TREATMENTS:

a) Immediately give 100% oxygen to insure tissue oxygenation.
b) Start IV with normal saline and give:
    i) If symptomatic give atropine 2-6mg IVP at 5 minute intervals until Atropinization (drying or respiratory secretions) occurs. T*here is not a maximum dose. Use extreme caution in a hypoxic patient (giving atropine to hypoxic heart may stimulate ventricular fibrillation).*
    ii) Pralidoxime (2-PAM, Protopam) IVP 1Gm over 2 minutes. (Not used in known Carbamate Poisonings.)
    iii) Seizures controlled according to protocol

Hydrofluoric Acid

8

Protocol No.

Example Materials

DESCRIPTION: Injury is twofold in that the compound causes corrosive burning of the skin and deep underlying tissue, also binds with calcium and magnesium from the nerve pathways, bone, and blood stream. Systemic effects may be delayed. The results are spontaneous depolarization producing excruciating pain, and hypocalcemia, resulting in tetany and cardiac dysrhythmias, which may degenerate to cardiac arrest. Skin may look deceptively normal at the surface. Pain is an indication for treatment, and that it's managed through the administration of calcium not analgesic.

TREATMENT:

In all cases Contact Medical Control/Director immediately for when indications of symptoms shows systemic involvement:

- Cardiac dysrrhythmias
- Conduction disturbances
- ST Segment abnormalities on EKG
- Tetany
- Seizures

Skin Burns:

a) Immediately flush exposed area with large amounts of water

b) Apply calcium gluconate Gel to burned area (mix 10 ml of a10% calcium gluconate solution into a 2 ounce tube of sterile water soluble jelly)

If pain continues:

c) calcium gluconate in a 5% solution is injected subcutaneously in a volume of 0.5 ml / cm^2 every ¼ inch into burned area and is also injected subcutaneously ½ inch around the circumference of the burned area.

Be prepared for a possible order for IV calcium gluconate. This must be ***considered*** for all inhalation and ingestion injuries because of the higher potential of systemic involvement and cardiac dsyrythmias.

Eye Injuries:

a) Immediately flush eyes with any means possible
b) Mix 50 ml of a 10% solution of calcium gluconate into 500 ml of normal saline for **irrigation**

c) Connect bag and tubing to a Morgan Irrigation Lens and run wide-open

d) If possible remove contact lens (morgan lens can not be used with contacts or trauma to the eye)

e) Irrigate the eyes

Inhalation Injury:

a) Mix 6 ml of sterile water into 3 ml of 10% calcium gluconate

b) Place solution in nebulizer and connect to oxygen to provide effective fog

Phenol

9

Protocol No.

Example Materials

DESCRIPTION: Also known as Carbolic Acid. Found in many household items and is commonly used as a disinfectant, germicide, antiseptic, and as a wood preservative. It causes injury much the same as other acids by causing coagulating necrosis. Systemic effects are seen throughout the central nervous system. Evidence of CNS depression including respiratory arrest.

TREATMENT:

a) Decontaminate initially with large volumes of water then irrigate burned area with mineral oil, olive oil, isopropyl alcohol or polyethylene glycol (PEG -golytely®, colyte®) if available. Alternate washes of mild soap and water and oil (or PEG) a minimum of two times each before transport.

Note: Small volumes of water increase absorption by expanding the surface area of exposure

b) Support respiration, control seizures, and ventricular ectopy with recognized means of treatment.

Chemical Burns to the Eyes

10

Protocol No.

Example Materials

Note: Watch water run off so other parts of the body do not become contaminated (especially other parts of the face, ears, and back of neck). Eye burns are almost always associated with contamination of other parts of the face or body.

TREATMENT:

a) Immediately start eye irrigation by whatever means possible

b) Insure all particulate matter or contact lenses are out of the eyes by digitally opening the lids and pouring irrigation fluid across the globe

c) Prepare the Morgan Lens by attaching an IV solution of normal saline, insure that fluid continues to flow at steady rate
   - Morgan Lens is not to used when trauma is observed to the eye (or if the eye has visible solid debris present that is not removed during the initial irrigation process) Foreign materials must be irrigated out of the eye before inserting a Morgan Lens)
   - Contact lens that may have been adhered to the eye must remain without removal and Morgan Lens can not be used,

d) Apply 1 to 2 drops of ponticaine, opthalmicaine or tetracaine Ophthalmic drops into the injured eye

e) Morgan lens can not be used if trauma to the globe is observed or a contact lens is adhered to the eye.

f) If Morgan Lens can not be used a nasal cannula can be used to irrigate the eyes. (If a nasal cannula is used the eyes must be held open digitally to effectively irrigate the eyes).

g) Adjust the flow so that a continuous solution is flowing from the eye

h) Continue irrigation until arrival at the emergency department.

i) Consider sedation to reduce anxiety

Bronchospasm Secondary to Toxic Inhalation

11

Protocol No.

Example Materials

- Chlorine, ammonia and industrial respiratory inrritants

DESCRIPTION: Wheezing due to exposure of the respiratory system to an irritant. The condition of wheezing may be caused by both bronchospasms and bronchial swelling because of the inhalation of an irritating gas or vapor. To adequately treat this condition both bronchodilation and antiinflammation pharmaceuticals must be considered.

TREATMENT:

a) Immediately give 100% humidified oxygen

b) Initiate an updraft of either atrovent or Proventil/Albuterol, 1 dose

c) Consider high levels of steroids (solu-medrol) to decrease respiratory swelling.

d) Wheezing due to exposure to fluorine or fluorine containing product follow Hydrofluoric Acid exposure protocol.

e) Wheezing due to exposure to chlorine or chloramines follow chlorine and chloramine protocol.

Tachydysrhythmias

12

Protocol No.

Example Materials

DESCRIPTION: Supraventricular tachycardia due to myocardial sensitization to a toxic agent and / or CNS stimulants.

TREATMENT:

a) Establish an IV of normal saline

b) Initiate administration of adenosine (Adenocard), 6mg rapid IV push followed by 10 ml saline IVP may repeat if no response or partial response

c) Contact Medical Control/Director for additional treatment modalities

d) Potential consideration is external pacing

Chlorine and Chloramine

13

Protocol No.

Example Materials

DESCRIPTION: Chloramine gas is produced by the mixture of household bleach and household ammonia. Chloramine and Chlorine is an irritant that converts to hydrochloric acid in the lining of upper airway. Chloramine is toxic and flammable. The patient will typically complain of a burning sensation to the upper respiratory system, coughing, wheezing and hoarseness.

TREATMENT:
After the patient is removed from the atmosphere and appropriate decontamination is completed, give:

a) 100% oxygen via NRB mask

b) Assemble a nebulizer and administer 5 ml of sterile water

c) If burning persists, mix 2.5 ml pediatric strength bicarbonate solution (adult strength sodium bicarbonate can be use in half strength) with 2.5 ml of normal saline and administer the mixture (5 ml) through a nebulizer.

d) Consider high levels of steroids (solu-medrol) to decrease respiratory swelling

Lacrimators

14

Protocol No.

Example Materials

- OC (Oleoresion Capsicum) pepper spray and other lacrimators

DESCRIPTION: The patient will usually present with severe burning of the eyes and nose, as well as congestion due to increased mucous production. Exam will find the patient suffering from increased tear production and blephrospasm.

TREATMENT:
Since the agent does not cause significant tissue damage the treatment is aimed at relieving the pain caused by nerve stimulation.

a) Initially determine the history of the injury. If a determination can be established that the pain is caused secondary to Capsicum Spray, the eyes should be immediately anesthetized.

b) Once it has been determined that the patient is not allergic to local anesthetics ("caine" derivatives), apply Tetracaine, Alcaine, or Opthalmacaine drops

c) When the blephrospasm is relieved, a visual exam is performed to evaluate for eye trauma

d) Consider and be prepared for anaphylactic reactions related to an exposure to lacrimators.

e) Assess for clear lung sounds and BP changes to insure that sensitivity has not occurred.

Halogenated Hydrocarbons

15

Protocol No.

Example Materials

- Chloroform, Chlorinated, Brominated hydrocarbons.

DESCRIPTION: Inhalation of this chemical family sensitizes the myocardium to the effects of epinephrine and/or catecholoamines. Significant inhalation can depress the CNS producing anesthetic like state with coma and death.

TREATMENT:
Since these agents can affect the CNS and sensitivity of the myocardium, Epinephrine should NOT BE ADMINISTERED as part of resuscitation.

Lasix is contraindicated for non-cardiogenic (chemically injured alveoli) pulmonary edema,

Follow general medical protocol - treat symptoms – follow above contraindications.

Simple Asphyxiants

16

Protocol No.

Example Materials

- Methane, propane, carbon dioxide, nitrogen gas

DESCRIPTION: Simple asphyxiants displace oxygen.

TREATMENT:

a) Remove patient from the environment

b) Immediately administer 100% oxygen, if unconscious perform endotracheal intubation to deliver 100% oxygen.

c) Start IV of 1000cc Normal Saline, age appropriate maintenance rate.

d) Follow general medical protocol - treat symptoms.

Appendix A

HAZARDOUS MATERIALS ALS FORMULARY

The following is a list of the standard HazMat Drug Box inventory. The drugs listed are in addition to what is usually carried in an agency's ALS drug box. It shall be a kit for the exclusive use during the treatment of the individual exposed to a hazardous material substance at the ToxMedic and HazMat Medic Level.

adenosine (Adenocard)
amyl nitrite Pearls
amiodarone
atropine sulfate
albutorol (Proventil)
calcium chloride
calcium gluconate
dextrose 5%
dextrose 50%
diazepam
dopamine
epinephrine 1:1000
epinephrine 1:10,000
hydrocoxobalamin (Cyano Kit)
ipratropium bromide (Atrovent)
isapropryl alcohol
lasix (Furosemide)
lidocaine
lorazepam (Ativan)
methylene Blue
magnesium sulfate
magnesium citrate
midazolam (Versed)
Morgan Irrigation Lens
morphine sulfate
naloxone (Narcan)
oxygen
pralidoximine (2-PAM, Protopam)
0.9% sodium chloride (NS)
sodium bicarbonate (Pediatric)
sodium nitrite
sodium thiosulfate
solu-medrol (methylprednisolone)
tetracaine Ophthalmic drops
thiamine