GLASTONBURY FIRE DEPARTMENT

STANDARD OPERATING GUIDELINES

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CATEGORY: HAZ-MAT

SUB-CATERGORY: EMERGENCY RESPONSE - GENERAL

SUBJECT: MARK I KIT

RELATED GUIDELINE: HZT-003

Section I – Introduction

A. Objective

To provide a guideline for the storage, inventory and maintenance of the MARK I Nerve Agent Antidote Kits. This procedure shall include the protocol for use of the MARK I Nerve Agent Antidote Kit.

B. Applicability

Applies to the storage and maintenance of the MARK I Nerve Agent Antidote Kit stored on the individual fire apparatus.

C. References

None

Section II- Maintenance

1. The nerve agent antidote kits shall be kept in a double lock box that is permanently secured on each vehicle. Each box will be locked using a padlock that is opened by a key stored in the Knox box Key Safe. Each box will have a plastic tag with a unique identification number permanently stamped on it.

2. Kits shall be distributed in numbered zip lock bags. The Diazepam component will be sealed in a tamper evident bag and placed in the zip lock bag. Each zip lock bag contains 3 Mark I kits and one Diazepam auto injector (a complete dose for one individual based on exposure). All components will be placed in the lock box on each apparatus.

3. It shall be the responsibility of the Captain to check the lock box and assure that the plastic tag is intact with the correct serial number assigned to that vehicle. Damaged or tampered tags shall be immediately reported to the Assistant Chief. The MARK I kit log (which attests that the seal is intact) shall be signed by a member of the Company as assigned by the Captain each week. Every other month (six times per year), the Department's designated Mark One Inventory Official will open each locked box and inventory all the kits and reseal each

lock box using a new plastic tag and serial number. The Mark One Inventory Official will collect the MARK I kit log from each apparatus and replace it with a new one showing the number of the new plastic tag.

4. Missing Mark I kits (or any parts of a Mark I kit) are to be reported to the Assistant Chief immediately upon determination of the loss. The Assistant Chief will investigate the loss of the Mark I kit and provide a report to Hartford Hospital and Capitol Region Metropolitan Medical Response System (CR-MMRS). The report shall be forwarded within 24 hours.

5. The Mark One Inventory Official shall be responsible for providing an inventory to CR-MMRS complete with the expiration dates semi-annually. CR-MMRS may perform periodic spot checks to assure antidote kit integrity and to check expiration dates.

6. In the event of a WMD incident where the Mark I kits are indicated for use, any officer of the Glastonbury Fire Department can open the Knox Box Key Safe to gain access to the key and gain rapid access to the Mark I kits. Post event, the Mark One Inventory Official will properly restock the inventory and provide a report to the Assistant Chief.

Section III - Applicability

PROTOCOL FOR USE OF THE NERVE AGENT ANTIDOTE (MARK I) KIT

Statement of Purpose

The user of the MARK I auto-injector is intended for self- or unit-preservation in the event of poisoning by a chemical nerve agent. Use of the kit is limited solely for this purpose. The use of the antidote for any other class of agents is contraindicated and may be life-threatening hazard to the responder.

Indications for Use

In the event of exposure to a known suspected WMD chemical agent, responders should withdraw immediately from the area if possible. Withdrawal should be made with the realization that the responder may be contaminated and should be limited to the nearest fresh-air site avoiding contamination of bystanders or other responders.

Kit Dosing

1. In general, pinpoint pupils, increased secretions, and muscle twitching is the most reliable signs of nerve agent exposure.

2. Nerve agents are either vaporous or liquid agents belonging to the classification of drugs known as organophosphates. Tabun (GA), Sarin (GB), Soman (GC) and VX are the most commonly stockpiled agents. The first three, though transported as liquids, are weaponized by vaporization and are inhaled. VX stays in a heavy liquid form, much like motor oil, and is spread by the droplet route.

Mild Vapor Exposure

1. Signs and symptoms following a vapor exposure occur with seconds to minutes, and include:

   a. Miosis - constriction of the pupil. Characteristically occurs from a nerve agent vapor exposure to the eye, or from direct contact with the eye. Miosis is usually accompanied by eye pain, described often as a dull ache in the front of the forehead or a pain about the orbit.
   b. Headache
   c. Dim vision
   d. Increased salivation and nasal discharge (nasal discharge may be the first indicator of exposure, aside from eye findings, in a vapor exposure).

e. Mild respiratory distress
f. Mild muscle weakness and/or mild, localized muscle twitching

2. Management

a. Most symptoms resolve spontaneously within 15-30 minutes
b. No specific treatment is indicated

3. Treatment:

a. If airway effects are noted (chest tightness, shortness of breath, airway secretions), and/or if other symptoms are not improving over time, **ONE MARK-I kit is administered.**
b. Monitor progress, noting that MARK-I auto injectors will not reverse miosis. Supplemental oxygen is required in those personnel with difficulty breathing, or with a history of cardiac disease.

Moderate Exposure

1. Signs and symptoms for a moderate exposure include:

a. Those occurring in mild exposures
b. More respiratory distress
c. Muscular weakness and fasciculation (twitching) - twitching can be localized, as in the case of mild to moderate liquid exposure, or generalized, as in large liquid and moderate to large vaporous exposures.
d. Gastrointestinal effects (vomiting and diarrhea) - these are generally the first systemic signs of skin exposure (liquid agent) to a nerve agent.
e. Sweating - may be localized for a mild to moderate liquid exposure, or generalized for a vapor or large liquid exposure.
f. Increased heart activity and High Blood Pressure.

2. Management and Treatment:

a. **ONE OR TWO MARK-I kits are administered, and titrate to symptomatology (up to a maximum of three MARK-I kits)**
b. Respiratory management - supplemental oxygen, assistance in suction as needed.

Severe Exposure

1. Signs and symptoms for a severe exposure include:

a. Miosis
b. Copious respiratory secretions impairing a patent airway
c. Severe respiratory distress or apnea
d. Possible cyanosis
e. Muscle twitching which progresses to muscle rigidity and flaccid paralysis
f. Altered level of consciousness - patient may be unconscious or seizing
g. Incontinence of bowel or bladder

2. The onset of symptoms for a severe exposure are usually rapid, from seconds to minutes for a vapor exposure, but make take up to 30 minutes for a VX or liquid exposure.

3. Management and Treatment

a. Aggressive airway control, including BVM, intubation, Combitube insertion, and vigilant suctioning.
b. **THREE MARK-I kits should be given in rapid succession**

c. Anticonvulsant medications will be required, when there is seizure activity.
Administer ONE DIAZEPAM AUTO-INJECTOR

Special Considerations

1. Riot control agents; i.e. mace, tear gas, pepper spray, are irritants to mucous membranes.
   a. Excessive tearing and rhino rhea will be present
   b. Shortness of breath may be present
   c. Miosis is never present
   d. Atropine and Pralidoxime are not indicated

2. Pesticides, such as malathion, chlorpyrifos, and diazinon are also organophosphates
   a. They are not as potent
   b. Treatment is usually limited to Atropine alone
   c. Pralidoxime is not indicated for pesticides containing carbamates

3. Industrial gases, such as chlorine and phosgene, have similar presentations to nerve agents
   a. Shortness of breath, skin or mucous membrane irritation, and cough may be present
   b. muscle fasciculation and miosis are not present

Section IV - Guideline for Administration of MARK I Kits

Note: Two self-administration protocols are outlined: the sequential protocol allows the two components of the MARK I kit to be given one at a time; the simultaneous protocol allows for both auto-injectors to be administered at the same time. There are no therapeutic advantages of one over the other, an either may be employed with the same effect.

A. Self-Administration: Sequential Protocol

1. Please note the MARK-I kit contains two auto-injectors; the larger black-tipped Pralidoxime, labeled #2, containing 600 mg of medication in 2ml; and the smaller green-tipped Atropine, labeled #1, containing 2mg in 0.7ml.
2. Hold the kit in the non-dominant hand with the larger (#2) auto-injector on top.
3. Grasp the smaller (#1) auto injector in the dominant hand with a pencil-type grip, pull and remove the smaller green-tipped #1 Atropine injector from its clips.
4. The Atropine auto-injector is now "armed".
5. Select a large muscle mass - the outer thigh is the preferred site.
6. The upper outer quadrant of the buttock is permissible, particularly for thin casualties.
7. Remove any objects, (coins, keys, buttons) that may be obstructing the path of the spring-loaded needle; do not inject directly onto or in close proximity to the thigh, hip or knee bone.
8. The auto-injectors are designed to be used through clothing and turnout gear.
9. Place the colored end (needle side) against the selected site and apply firm, even, stabbing pressure to the auto-injector.
10. Hold in place for 10 seconds.
11. Massage the site if possible.
12. Repeat, using the black-colored Pralidoxime injector labeled #2.
13. Make every effort to dispose of used needle carefully, either by utilizing a sharps container/bucket, and/or by bending the tips of the non-retracting needles against a hard surface (ground).
14. Monitor for improvement in symptoms – remember, miosis or pupillary constriction will not improve unless *topical* Atropine is given.
15. Multiple or repeated doses may be given according to signs and symptoms. An EMT-P (or above) must approve multiple doses.

B. Self-Administration: Simultaneous Protocol

1. Prepare both auto-injectors, as described above.
2. Select two muscle sites, one in each thigh or buttock.
3. Simultaneously, inject both auto-injectors into the desired sites, holding firm pressure for 10 seconds until both auto-injectors are fully discharged.
4. Massage, dispose of sharps, and monitor effects and symptoms as above.

C. Buddy Administration

1. If conscious, have the recipient squat and not kneel to receive antidote administration.
2. If unconscious, position the recipient on his/her side in a lateral position.
3. Select the thigh or upper outer quadrant of the buttocks as the site of injection (the thigh is preferable).
4. Administer per injection protocols.
5. Monitor for improvement or need for additional MARK I injections.
6. In order to determine that a responder has received treatment with antidote kits(s), each CR-MMRS kit shall include a marking pen. The pen is to be used to signify that a responder has received treatment with MARK 1 kits and/or Diazepam.
7. A single vertical line shall be drawn upon the forehead of the responder for every Mark I kit received, and "V" added when needed to signify the administration of the Diazepam component.

Section V - Post-Treatment Actions

A. Once egress is made and self-treatment has been performed, the responder shall notify other personnel on scene of the danger inside and shall await decontamination before advancing for further medical evaluation.
B. Once treated with antidote kit(s), the responder shall be taken off-line immediately and transported to the nearest Emergency Department for further medical evaluation.
C. A triage tag will be attached to the responder indicating the use of MARK I/Diazepam auto-injector(s), and adding any information regarding the exposure (liquid or vapor, signs and symptoms, and especially if the responder has been decontaminated).

Section VI- Approval

Fire Chief Richard P Thorn Date of Approval: 1/11/16

APPENDIX I

CAPITOL REGION MMRS MARK I KIT UTILIZATION

DISASTER PROTOCOL

Introduction

The primary intent of using MARK-I Kits is to allow first responders to self-treat or to treat other first responders in the event of a chemical nerve agent exposure. However, the Capitol Region Metropolitan Medical Response System realizes that, in the event of a mass public exposure to a nerve agent, the first responders may possess the resources to treat other members of the public safety response team. Accordingly, the Capitol Region MMRS endorses the following protocol for on-scene administration of the MARK-I Kits.

ON-SCENE PROTOCOL

"A Disaster Occurs"
↓
Self-Treat and Treat Your Crew
↓
Provide Treatment To Other Public Safety Responders
Treat ONLY Public Safety Personnel - NOT the general public
↓
Paramedics May Administer the MARK 1 Kits
If sufficient resources are not available then:
↓
Basic-EMT May Administer the MARK 1 Kits
If sufficient resources are not available then:
↓
Trained First Responders May administer the MARK 1 Kits

TRANSPORT

For patients requiring continued administration of the MARK 1 Kit the Capitol Region MMRS authorizes the following transportation protocol *(in order of preference):*
↓
Paramedic Accompanies the Patients
If sufficient resources are not available then:
↓
Basic-EMT Accompanies the Patients
If sufficient resources are not available then:
MARK 1 kits may be given to transporting medical personnel to facilitate continued patient care, including air-evacuation crews