County of Kern

EMERGENCY MEDICAL SERVICES DEPARTMENT

MARK-1 KIT FOR SELF-ADMINISTRATION POLICIES AND PROCEDURES

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I. Program Description

A. Mark-I Kit administration for symptomatic nerve agent exposure may be approved on an optional basis for self-administration by all ALS and BLS Kern County EMS service providers effective August 16, 2005.

B. The Mark-I Kit contains antidotes to be used in instances of exposure to nerve agents (Sarin, Soman, Tabun, VX) or to organophosphate agents (Lorsbanm Cygon, Delnav, Malathion, Supracide, Parathion, Carbopenthion).

C. The Mark-I Kit may be self-administered by a rescuer exhibiting signs and symptoms of nerve agent exposure when nerve agent exposure is suspected. **The Mark-I Kit should not be used as a prophylactic measure.**

D. The EMS Department Medical Director shall provide direct medical control of the program and is responsible for ensuring program compliance within policy and procedure, training program curriculum approval, and quality assurance.

E. The EMS Department Medical Director shall be responsible for approval of all equipment used in conjunction with Mark-I administration, data collection, and evaluation of the program, and reporting to the State EMS Authority.

F. The Mark-I Kit is not intended for administration to patients.

II. General Provisions

A. The Mark-I Kit for self-administration is to operate in compliance with Chapter 2, Division 9, Title 22 of the California Code of Regulations and Department policies and procedures.

B. The Mark-I Kit may only be self-administered by personnel having valid Kern County paramedic or EMT-I accreditation and are employed by an EMS provider that has been authorized to carry Mark-1 Kit.

C. EMS Department authorization is required for an EMS provider to carry and use the Mark-1 Kit.

D. Provider authorization shall immediately be terminated if the provider is unable to meet the requirements of these policies, or the program is terminated.

E. EMS providers wishing to be authorized as a Mark-1 Kit provider will provide a written application to the Department. The written application must include a thorough description of proposed program.

F. To be eligible for Mark-1 Kit Provider authorization all of the following minimum requirements shall be met:

1. Organization must be an existing EMS provider that is authorized by the Department to provide either or both EMT-1 and EMT-P services;
2. Organization must have and maintain a Mark-1 Kit training program which complies with the provisions of these policies and procedures;
3. Organization must have and maintain at least three Mark-1 Kits for each EMT-1 and EMT-P deployed as a first responder;
4. Organization must have and maintain a quality assurance mechanism for the Mark-1 Kit program to ensure proper use and stock rotation; and
5. Organization must have and maintain records, reports, and activity data according to these policies.

G. An authorized provider shall ensure the Mark-1 Kit program is continually operated according to these policies and procedures. The Department may terminate provider authorization for non-compliance to these policies and procedures.

H. The Department may revise, modify, or delete the policies and procedures as necessary.

III. Equipment

Each Mark-I Kit consists of two auto-injectors containing:

- Atropine Sulfate (Atropine) 2 mg in 0.7 cc
- Pralidoxime Chloride (2 PAM) 600 mg in 2 cc

IV. Training Requirements for EMS Service Providers

A. All providers who opt to carry the Mark-I Kits must maintain training records reflecting that the pre-hospital providers carrying the Mark-I Kits have been trained following the objectives set forth by the Department.

B. Paramedic and EMT-I personnel wishing to use the Mark-I Kits must attend a training program covering the specific objectives. At the end of the training program the participants must be able to:

a. Identify the medications contained in the Mark-I auto-injector;

b. Identify the signs and symptoms of patients exposed to chemical agents;

c. Determine the protocol and procedure for Mark-I Kit administration;

d. Demonstrate the steps for administering the Mark-I auto-injector;

e. Understand that the Mark-I Kit may not be used as a prophylactic measure;

f. Be aware of contraindications and personal safety when using the Mark-I auto-injector;

g. Identify the effects and other drug specific information for the Mark-I Kits.

C. Providers shall maintain a training roster of all persons who have successfully passed the training program and post-test. Training rosters shall be made available to the Department upon request.

V. Protocol for Use

A. If dermal exposure has occurred, decontamination is critical and should be done with standard decontamination procedures.

B. Assess for the presence of signs and symptoms of nerve agent or organophosphate exposure.

Mnemonic for Nerve Agent Exposure
Salivations (excessive production of saliva) **L**acrimation (excessive tearing) **U**rination (uncontrolled urine production) **D**efecation (uncontrolled bowel movements) **G**astrointestinal distress (cramps) **E**mesis (excessive vomiting) **B**reathing difficulty **A**rrhythmias (irregular heartbeat) **M**yosis (pinpoint pupils)

C. If signs and symptoms of nerve agent exposure exist, the Mark-I Kit may be self-administered according to the following dosing regimen.

Exposure	Presentation	Treatment
No Sign or Symptoms	None	Remove to safe area Decontamination Observation & transport
Mild Exposure	Unexplained runny nose Tightness in chest Difficulty breathing Bronchospasm (wheezing)	One Mark-I Kit
Moderate Exposure	Pinpoint pupils resulting in blurred vision Drooling Excessive sweating Nausea and/or vomiting Abdominal cramps	One to two Mark-I Kits
Severe Exposure	Involuntary urination Involuntary defecation Twitching or seizures Staggering Headache Lethargy Apnea	Three Mark-I Kits administered in rapid succession

VI. Operational Procedure

A. Injection Site Selection

a. The injection site most commonly used for administration is the outer thigh muscle.

b. It is important that injections be given into a large muscle mass area.

c. If the individual is thinly built, the injections should be administered into the upper outer quadrant of the buttocks.

d. The Mark-I Kit may be injected through clothing.

B. Arming the Mark-I Auto-Injector

a. Immediately put on protective mask

b. Remove antidote kit

c. With non-dominant hand, hold the auto-injectors by the plastic clip so that the larger auto-injector is on top and both are positioned at eye level.

d. With your dominant hand grasp the atropine auto-injector (the smaller of the two) with the thumb and first two fingers. **Do not cover or hold the needle with your hand, thumb, or fingers-this may result in accidental injection**.

e. The auto-injector is now armed.

C. Self-Administration of Antidote

a. Hold the auto-injector with your thumb and two fingers (pencil writing position).

b. Position the green end of the injector against the injection site (thigh or buttock).

c. Apply firm, even pressure for at least ten seconds. Firm pressure automatically triggers the coiled spring mechanism and will plunge the needle through clothing, into the muscle at the same time injecting antidote into the muscle tissue.

d. Carefully remove the auto-injector from the injection site.

e. Next, pull the 2 PAM auto-injector (the larger of the two) out of the clip.

f. Inject in the same manner as described in the steps above, holding the black end against the outer thigh (or buttocks).

g. Massage injection site if time permits.

h. Continued monitoring and transport to a hospital is mandatory following the administration of the Mark-I Kit.

VII. Data Collection and Reporting

A. In the event that a Mark-I Kit is used, notification must be made to the Department the next business day. The report shall include:

1. Name of the victim;

2. Circumstances surrounding the incident;

3. Presenting signs and symptoms;

4. Number of Mark-I Kits administered;

5. Medical attention the victim received;

6. Current status of the victim.

VIII. Medical Control

A. The Department Medical Director will provide medical oversight for Mark-I Kit self-administration.

B. Providers carrying Mark-I Kits must notify the Department in writing prior to deployment. The notification must include the name of the organization, address, program administration contact person, phone number and a statement verifying that the Mark-I Kits will deployed in accordance with Department policy.

H:\Staff-Shared_Policies_Procedures_Protocols\Mark-1 Kit Self-Admin_final.doc

Appendix A - Sample Training Curriculum

Mark-I Auto-Injector Education Guidelines

INTRODUCTION:

The Kern County EMS Department has approved the use of the Mark-1 Kit on an optional basis for EMS service providers. The Mark-1 kit is to be used for self-administration when EMT-I or paramedic personnel are exposed to nerve agents (Sarin, Suman, Tabun, Vx) or organophosphates. Use of the Mark-1 Kit is to be based on signs and symptoms of exposure. The Mark-I Kit is not to be used as a preventive measure.

Although criminal acts and terrorism are one source of nerve gas exposure, the accidental release of similar organophosphate compounds in industrial and farming environments should not be ruled out.

OBJECTIVES:

1) Identify the medications contained in the Mark-I auto-injector;

2) Identify the signs and symptoms of patients exposed to chemical agents;

3) Determine the protocol and procedure for Mark-I Kit administration;

4) Demonstrate the steps for administering the Mark-I auto-injector;

5) Understand that the Mark-I Kit may not be used as a prophylactic measure;

6) Be aware of contraindications and personal safety when using the Mark-I auto-injector;

7) Identify the effects and other drug specific information for the Mark-I Kits.

EQUIPMENT:

Each Mark-I Kit consists of two auto-injectors containing:

- Atropine Sulfate (Atropine) 2 mg in 0.7 cc
- Pralidoxime Chloride (2 PAM) 600 mg in 2 cc

Each auto-injector is a disposable, spring-loaded, pressure activated system pre-filled with medication. Its simplicity, concealed needle, and speed of injection render it quick, easy, and convenient for self-administration.

The Mark-I Kit consists of one atropine and one pralidoxime chloride auto-injector linked together with a plastic clip. The atropine is administered first, followed by the pralidoxime chloride.

INDICATIONS FOR USE:

Nerve agents are toxic materials that produce injury and death within seconds to minutes. The signs and symptoms caused by nerve agents are characteristic and easily recognizable with a high index of suspicion. Signs and symptoms of nerve agent exposure are:

1. Lacrimation (tearing)
2. Unexplained runny nose
3. Salivation (drooling)
4. Diaphoresis (sweating)
5. Pulmonary edema
6. Myosis (constricted pupils)
7. Blurred vision
8. Muscle twitching
9. Paralysis
10. Airway constriction
11. Irregular pulse rate
12. Loss of consciousness
13. Seizures
14. GI distress (cramps)
15. Apnea
16. Chest tightness
17. Shortness of breath
18. Nausea and vomiting
19. Uncontrolled urination
20. Uncontrolled defecation

The acronym "SLUDGE-BAM" is helpful in remembering signs and symptoms of nerve gas exposure.

Mnemonic for Nerve Agent Exposure
Salivations (excessive production of saliva) **L**acrimation (excessive tearing) **U**rination (uncontrolled urine production) **D**efecation (uncontrolled bowel movements) **G**astrointestinal distress (cramps) **E**mesis (excessive vomiting) **B**reathing difficulty **A**rrhythmias (irregular heartbeat) **M**yosis (pinpoint pupils)

MECHANISM OF ACTION:

The nervous system controls body functions by secreting chemical transmitters which act as "instructions" to nerves, muscles, and glands at the nerve endings. These "instructions" produce the effect or either stimulation or relaxation.

When a nerve agent is present, it interferes with the normal "instructions" of the chemical transmitters that direct the muscle or gland to return to the un-stimulated state, relaxed state. Blocking the "instructions" to relax results in the nervous systems being over-stimulated.

The over-stimulation of the nervous system results in the muscles and some glands over-reacting, producing the symptoms of SLUDGE-BAM.

Pre-hospital management for nerve agent or organophosphate poisoning is a two-pronged attack focusing on countering the poison with antidote and preventing death by supporting respirations and controlling seizures. The primary cause of death from these agents is respiratory failure; therefore aggressive airway control and ventilation are top priorities.

The initial treatment for nerve agent exposure consists of a two-part antidote, atropine and pralidoxime chloride (2-PAM).

Atropine is the primary drug for nerve agent exposure. 2-PAM is most effective if administered immediately after poisoning, but not before atropine.

Atropine stops the effect of the nerve agent by blocking the effects of over-stimulation. Atropine counters the actions of the nerve agent at the nerve receptors. Atropine relieves the smooth muscle constriction in the lungs (wheezing, respiratory distress) and gastrointestinal tract (diarrhea, cramps) and it dries up respiratory tract secretions.

The companion drug to atropine is pralidoxime chloride (2-PAM). 2-PAM acts to restore normal function at the nerve endings by removing the nerve agent. The 2-PAM helps re-establish normal skeletal muscle contraction, relieving twitching and paralysis of respiratory muscles.

Adverse actions may occur, but there are no contraindications to treating systemic patients.

Adverse reactions:

1. Atropine may cause chest pain. It may also exacerbate angina or induce myocardial infarction.

2. Pain may be experienced at 2-PAM injection site.

3. 2-PAM may cause blurred vision, dizziness, headache, drowsiness, nausea, rapid heart rate, increased blood pressure, and hyperventilation.

4. Both atropine and 2-PAM should be used with caution (not withheld) in patients with pre-existing cardiac disease, high blood pressure, or strokes.

DOSING:

If signs and symptoms of nerve agent exposure exist, the Mark-I Kit may be self administered according to the following dosing regimen:

Exposure	Presentation	Treatment
No Sign or Symptoms	None	Remove to safe area Decontamination Observation & transport
Mild Exposure	Unexplained runny nose Tightness in chest Difficulty breathing Bronchospasm (wheezing)	One Mark-I Kit
Moderate Exposure	Pinpoint pupils resulting in blurred vision Drooling Excessive sweating Nausea and/or vomiting Abdominal cramps	One to two Mark-I Kits
Severe Exposure	Involuntary urination Involuntary defecation Twitching or seizures Staggering Headache Lethargy coma Apnea	Three Mark-I Kits administered in rapid succession

PROCEDURE FOR SELF-ADMINISTRATION:

When a rescuer arrives on a scene that is potentially contaminated with nerve agents, he/she must wear personal protective equipment. If symptoms of nerve agent exposure manifest, you must IMMEDIATELY self-administer the nerve gas antidote, the Mark-I Kit.

Injection Site Selection:

1. The injection site most commonly used for administration is the outer thigh muscle.
2. It is important that injections be given into a large muscle mass area.
3. If the individual is thinly built, the injections should be administered into the upper outer quadrant of the buttocks.

Arming the Mark-I Auto-Injector:

1. Immediately put on protective mask.

2. Remove antidote kit.

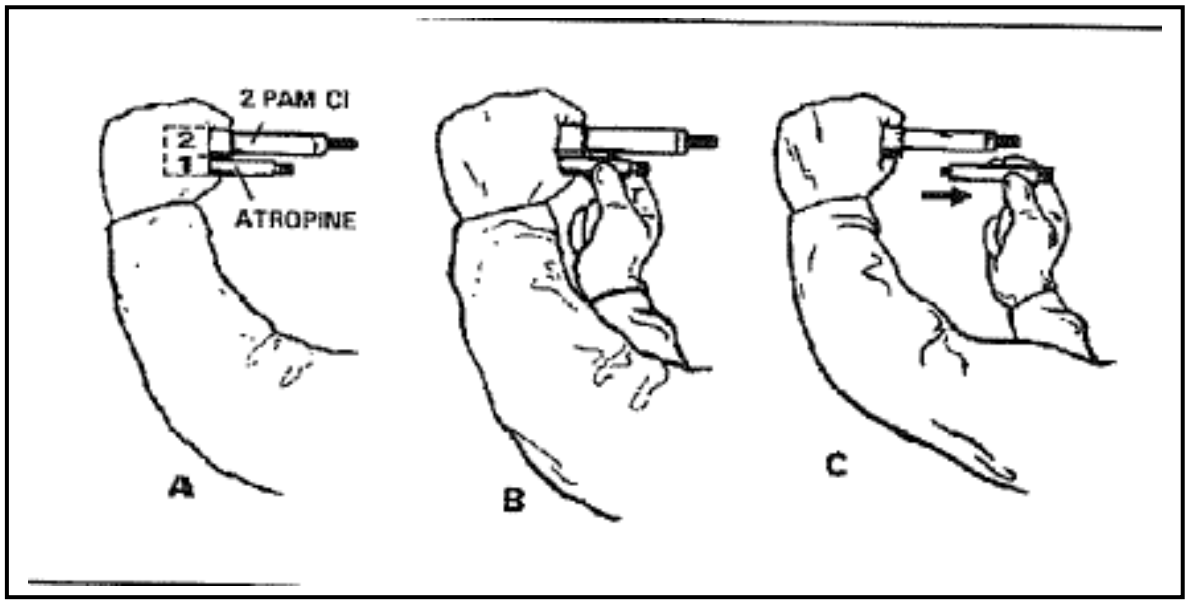
3. With non-dominant hand, hold the auto-injectors by the plastic clip so that the larger auto-injector is on top and both are positioned at eye level.

4. With your dominant hand grasp the atropine auto-injector (the smaller of the two) with the thumb and first two fingers. Do not cover or hold the needle with your hand, thumb, or fingers-this may result in accidental injection.

5. The auto-injector is now armed.

Self-Administration of Antidote:

1. Hold the auto-injector with your thumb and two fingers (pencil writing position).



2. Position the green end of the injector against the injection site (thigh or buttock).

3. Apply firm, even pressure for at least ten seconds. Firm pressure automatically triggers the coiled spring mechanism and with plunge the needle through clothing, into the muscle at the same time injecting antidote into the muscle tissue.

4. Carefully remove the auto-injector from the injection site.

5. Next, pull the 2 PAM auto-injector (the larger of the two) out of the clip.

6. Inject in the same manner as described in the steps above, holding the black end against the outer thigh (or buttocks).

7. Massage injection site if time permits.

8. Continued monitoring and transport to a hospital is mandatory following the administration of the Mark-I Kit.

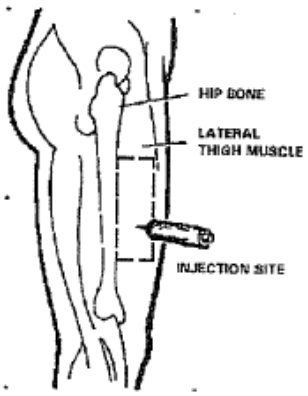


Figure 1 - Thigh injection site

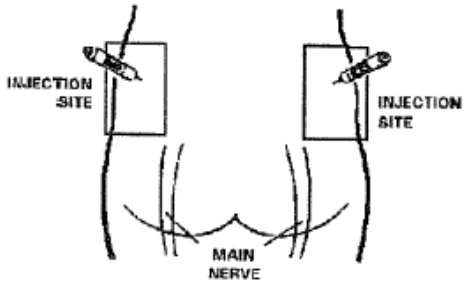


Figure 2 - Buttocks injection site

RE-EVALUATION AFTER ADMINISTRATION:

A maximum of three Mark-I Kits per occurrence, per person may be used. If nerve agent symptoms are still present after fifteen minutes, and the person has not administered the maximum of three Mark-I Kits, injections may be repeated in fifteen minute intervals until symptoms are resolved or the maximum of three Mark-I Kits has been reached.

Continued monitoring and transport to a hospital is mandatory following the administration of the Mark-I Kit.

DOCUMENTATION:

In the event that a Mark-I Kit is used, notification must be made to the Department the next business day. The report shall include the following information. A notification form is at Appendix C of the EMS Department Mark-1 Kit For Self-Administration Policies And Procedures

1. Name of the victim;
2. Circumstances surrounding the incident;
3. Presenting signs and symptoms;
4. Number of Mark-I Kits administered;
5. Medical attention the victim received;
6. Current status of the victim.

Appendix B - Sample Post-Test

Kern County Emergency Medical Services
Post Test-Mark-I Auto-Injector Training

Name:_____Date:_____

1. Name the two medications found in the Mark-I auto-injector.

_____

_____

2. Identify six signs and symptoms of nerve agent/organophosphate exposure.

_____

_____

_____

_____

_____

_____

3. What does the acronym "SLUDGE-BAM" stand for?

S_____

L_____

U_____

D_____

G_____

E_____

B_____

A_____

M_____

4. What is the maximum number of Mark-I kits that an individual may self-administer?

    a. 1
    b. 2
    c. 3
    d. 4

5. What is the indication for use of the Mark-I auto-injector?

_____

_____

6. May the Mark-I auto-injector be used as a precautionary measure to attempt a rescue?

_____

7. May the Mark-I auto-injector be administered to patients/public?

_____

8. Are there any absolute contraindications for the Mark-I auto-injector?

_____

9. What are the potential side effects of atropine?

_____

_____

10. What are the potential side effects of pralidoxime chloride?

_____

_____

Appendix C - Notification of Use of Mark-I Kit

NOTIFICATION OF MARK-1 KIT USE

Name of Victim Self-Administering the Mark-1 Kit: _____

EMT-1 Kern Co. certification no. _____
Paramedic Kern Co. certification no. _____

Date person passed the Mark-1 Kit training course: _____
Name of employer/first-responder organization: _____

Date of self-administration of Mark-1 Kit: _____

List signs and symptoms the victim observed of him/herself:

Time signs and symptoms initially observed: _____

Time first Mark 1 Kit administered: _____
Time second Mark 1 Kit administered: _____
Time third Mark 1 Kit administered: _____

Describe the circumstances surrounding the incident:

Describe other medical attention the victim received:

Current status of the victim:

Submitted by:
Name (print) _____
Signature _____
Date _____