

PROCEDURES FOR ADMINISTERING THE MARK 1 KIT



NERVE AGENT INJURY

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EXPOSURE - Signs & Symptoms

Exposure	Signs & Symptoms
Mild	▶ Unexplained runny nose
	▶ Tightness in the chest
	▶ Difficulty breathing
	▶ Bronchospasm
Moderate	▶ Pinpoint pupils resulting in blurred vision
	▶ Drooling
	▶ Excessive sweating
	▶ Nausea and/or vomiting
	▶ Abdominal cramps
	▶ Involuntary urination and/or defecation
Severe	▶ Jerking, twitching and staggering
	▶ Headache
	▶ Drowsiness
	▶ Coma
	▶ Convulsions
	▶ Apnea

- Mark 1 kits are to be used when personnel are exposed to nerve agents (Sarin, Suman, Tabun, Vx) and have signs and symptoms of nerve agent exposure.
- If you experience any or all of the nerve agent poisoning symptoms, you must **IMMEDIATELY** self-administer the nerve gas antidote.

Mnemonic for Nerve Agent Exposure

D – Diarrhea
U – Urination
M – Miosis
B – Bradycardia, Bronchorrhea, Bronchospasm
E – Emesis
L – Lacrimation
S – Salivation, Sweating

DOSAGE SCHEME FOR MARK 1 ADMINISTRATION

Mild to Moderate Exposure

- Dyspnea (following vapor exposure) and GI effects (following liquid exposure) should be treated by administering one Mark 1 kit.
- Repeat administration at 5-10 minute intervals until improvement or signs of Atropinization is noted. (Rapid heart rate or very dry mouth).
- **DO NOT** treat miosis or rhinorrhea unless symptoms are severe.

Severe Exposure

- Drooling, excessive sweating, vomiting, involuntary urination or defecation, muscle twitching, convulsions, etc. should be treated by administering one Mark 1 kit.
- Repeat administration in 3-5 minute intervals until improvement or signs of Atropinization is noted.
- IM administration is better than IV in hypoxic patients.
- Treat seizures with Valium per S/O.

Do not administer more than 3 doses of 2-PAM CL (due to hypertensive effects). Titrate Atropine as needed to alleviate signs and symptoms or until signs of Atropinization is noted.

NERVE AGENT ANTIDOTE KIT MARK 1



Atropine autoinjector (2 mg in 0.7 cc's)
Pralidoxime chloride autoinjector - **2-PAM** (600 mg in 2 cc's)

MARK 1 Kit - Components

The MARK 1 Kit consists of four separate components: the Atropine autoinjector, the 2 PAM Cl autoinjector, the plastic clip, and the foam carrying case.

The Atropine autoinjector consist of a hard plastic tube containing 2 mg (0.7 milliliter (ml)) of Atropine in solution. It has a pressure activated coiled spring mechanism which triggers the needle for injection of the antidote solution. The container is white plastic with yellow lettering on green identification and directions labels. The safety cap is yellow plastic attached to the clip at the rear of the container. The needle end is a green plastic cap which, when pressure is applied, activates the spring mechanism.

The 2 PAM Cl autoinjector is a hard plastic tube which dispenses 600 mg/2 ml of 2 PAM Cl (300 mg/ml) solution when activated. It has a pressure activated coiled spring mechanism identical to that in the atropine autoinjector. The container is clear plastic with black lettering on a brown identification label. Directions are in black lettering on a white background. The safety cap is gray plastic attached to the clip at the rear of the container. The needle end is black plastic.

The clip is made of clear hard plastic constructed to hold the pair of autoinjectors together while attached to their safety caps. The safety caps are held flush to the bottom of the plastic clip by a movable metal retaining flange. The clip container recesses are labeled with black numbers: "1" for the atropine and "2" for the 2 PAM Cl autoinjector.

HOLDING SET OF AUTOINJECTORS



IMPORTANT NOTE:

The Mark 1 Kits should be readily available and accessible by personnel in **one minute or less !!!**

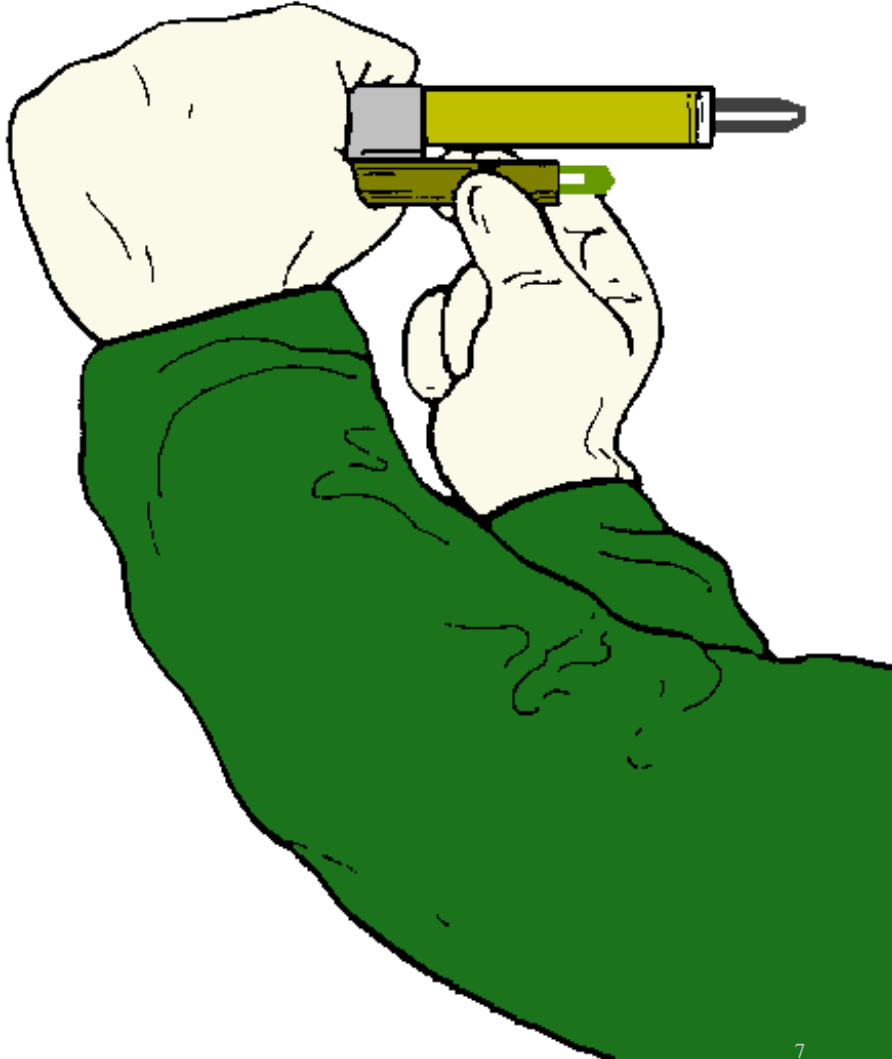
Remove the antidote kit from the foam carrying case.

With your nondominant hand, hold the autoinjectors by the plastic clip so that the larger autoinjector is on top and both are positioned in front of you at eye level.

The Atropine is the shorter of the two autoinjectors and has a green needle port.

The 2-PAM CL is the longer of the two autoinjectors and has a black needle port.

GRASPING THE ATROPINE AUTOINJECTOR



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 end with your hand, thumb, or fingers. You might accidentally inject your self.

An accidental injection into the hand **WILL NOT** deliver an effective dose of the antidote, especially if the needle goes through the hand.

REMOVING THE ATROPINE AUTOINJECTOR

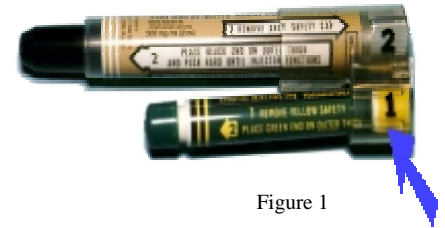
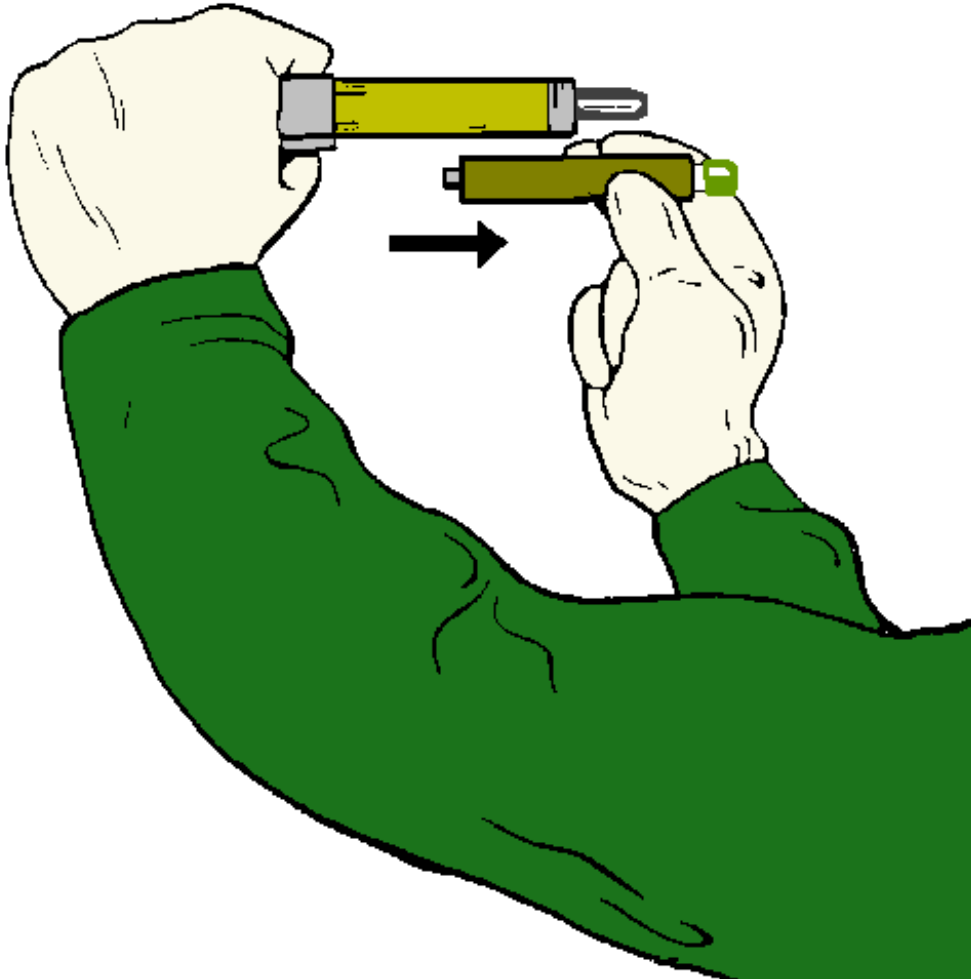


Figure 1

Pull the injector out of the clip with a smooth motion. Ensure that the yellow safety cap has been removed. (The cap should remain in the clear plastic clip – see Figure 1.)

**The autoinjector is
now armed !!!**

PROCEDURE FOR INJECTING ATROPINE



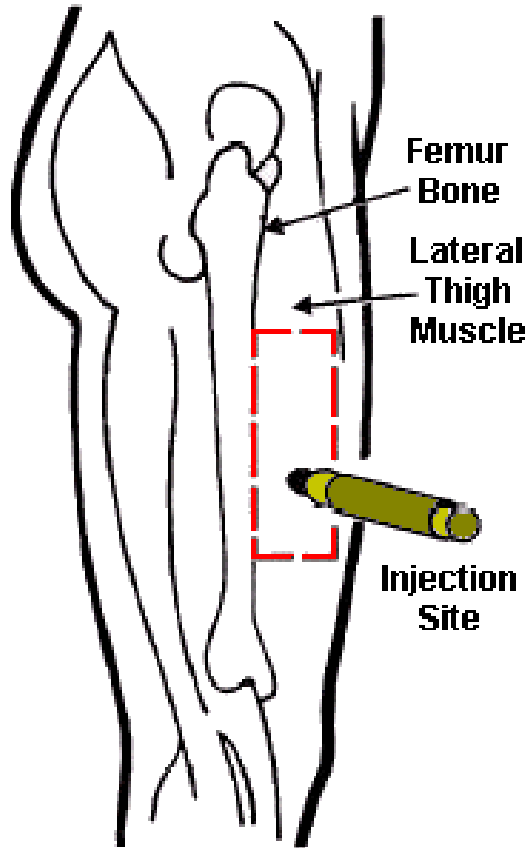
Hold the autoinjector with your thumb and two fingers (pencil writing position).

Be careful not to inject yourself in the hand!

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

DO NOT inject into areas close to the hip, knee, or thigh bone.

PROCEDURE FOR INTRAMUSCULAR INJECTION OF THE MARK 1 KIT



Apply **firm, even pressure** (not jabbing motion) to the injector until it pushes the needle into your thigh (or buttocks). Using a jabbing motion may result in an improper injection or injury to the thigh or buttocks.

Hold the injector firmly in place for at least 10 seconds. The seconds can be estimated by counting "one thousand one," "one thousand two," and so forth.

Firm pressure automatically triggers the coiled spring mechanism. This plunges the needle through the clothing into the muscle and at the same time injects the antidote into the muscle tissue.

Carefully remove the autoinjector from your injection site.

BUTTOCKS INJECTION SITE



If you are thinly-built, inject yourself into the upper outer quarter (quadrant) of the buttock.

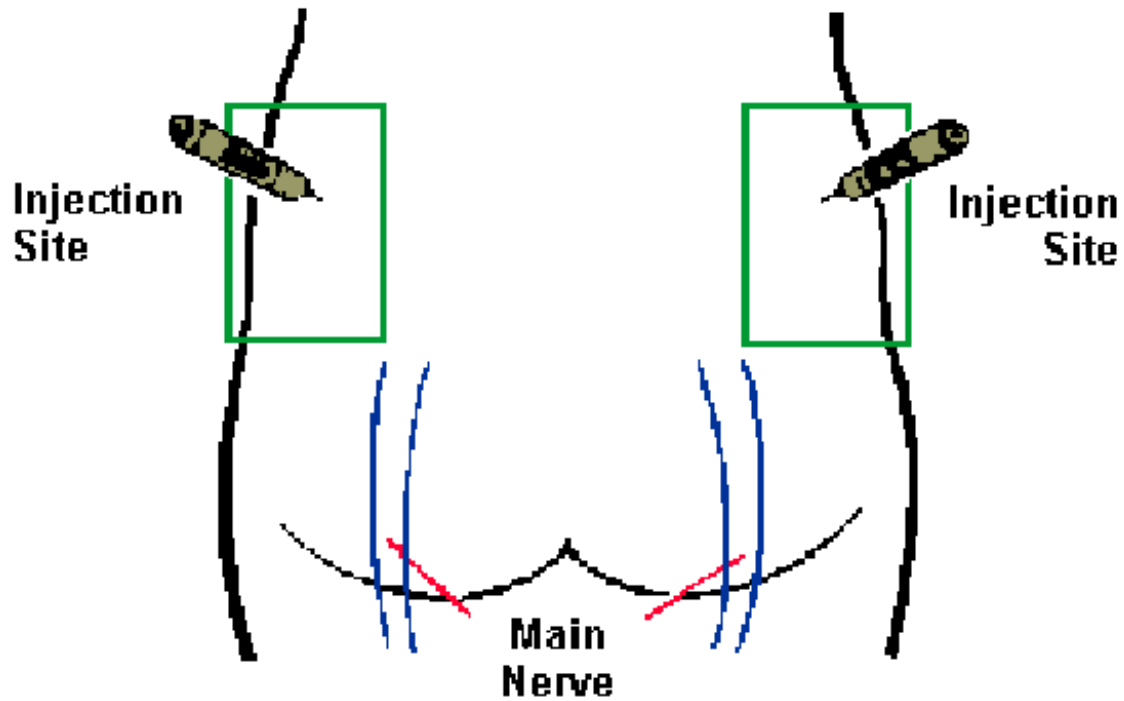
There is a nerve that crosses the buttocks; hitting this nerve can cause paralysis. Therefore, you must only inject into the upper outer quarter (quadrant) of the buttocks. Apply firm, even pressure (not jabbing motion) to the injector until it pushes the needle into your buttocks.

Hold the injector firmly in place for at least 10 seconds.

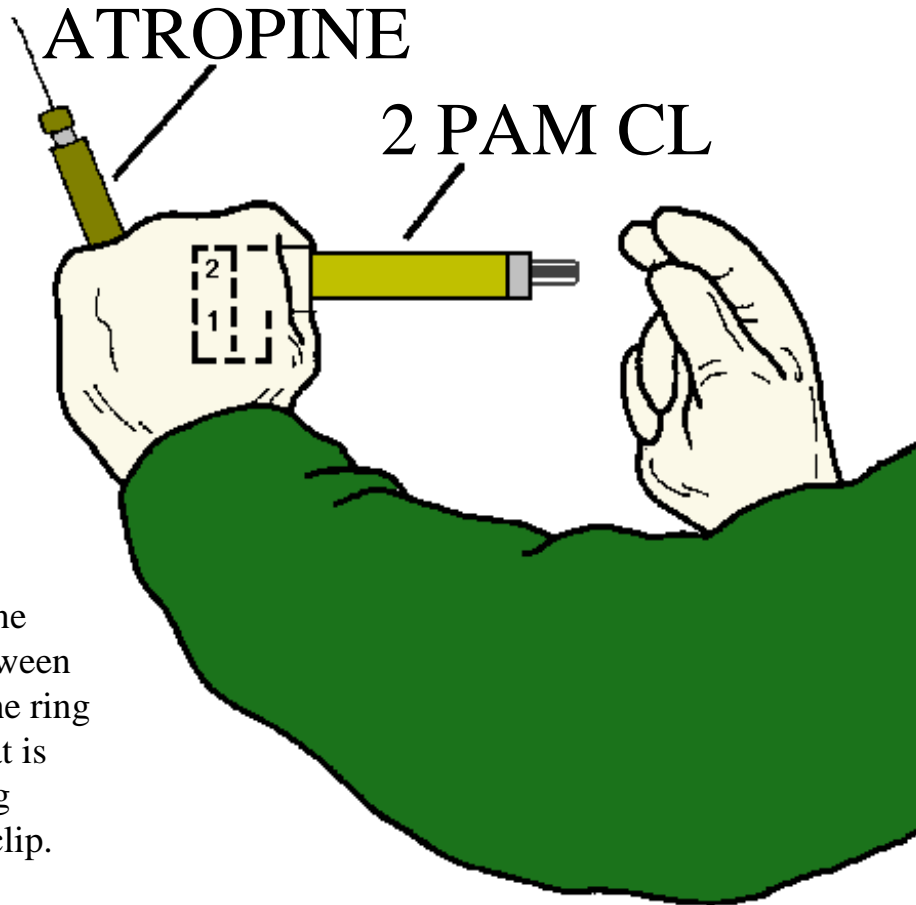
Firm pressure automatically triggers the coiled spring mechanism. This plunges the needle through the clothing into the muscle and at the same time injects the antidote into the muscle tissue.

Carefully remove the autoinjector from your injection site.

INTRAMUSCULAR INJECTION SITE ON THE BUTTOCKS



USED ATROPINE INJECTOR

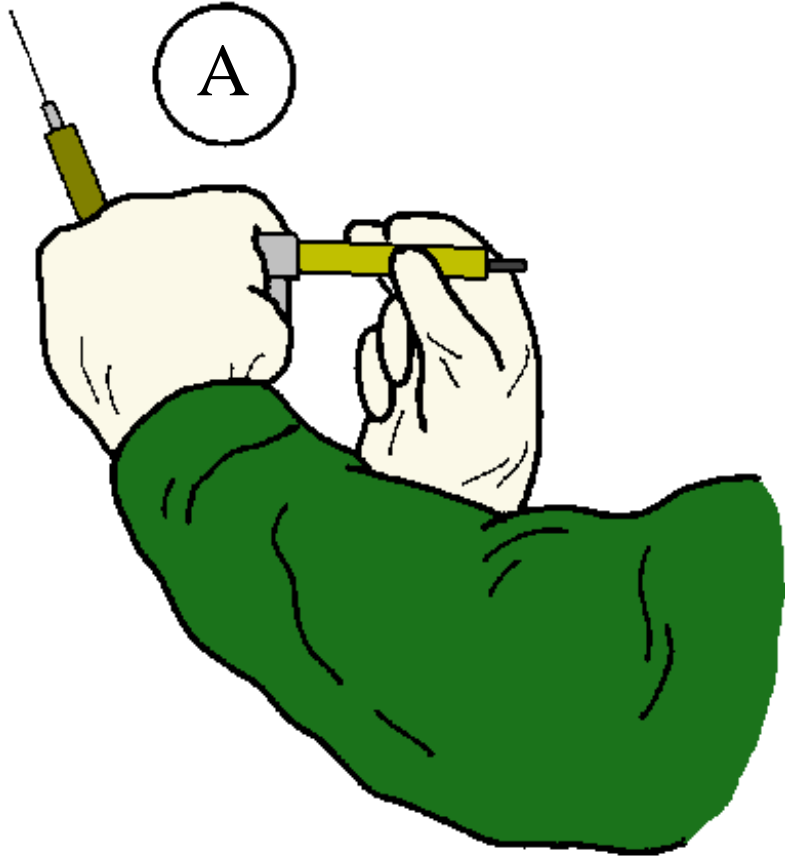


Place the used atropine injector carefully between the little finger and the ring finger of the hand that is holding the remaining autoinjector and the clip.

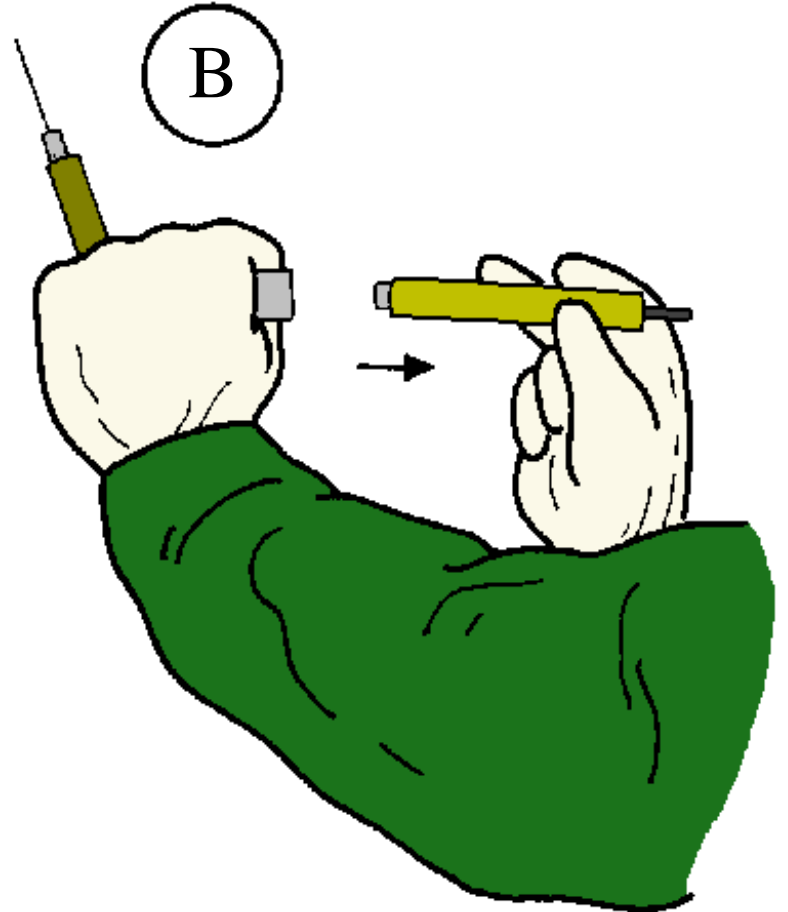
Watch out for the needle!

REMOVING 2 PAM CL

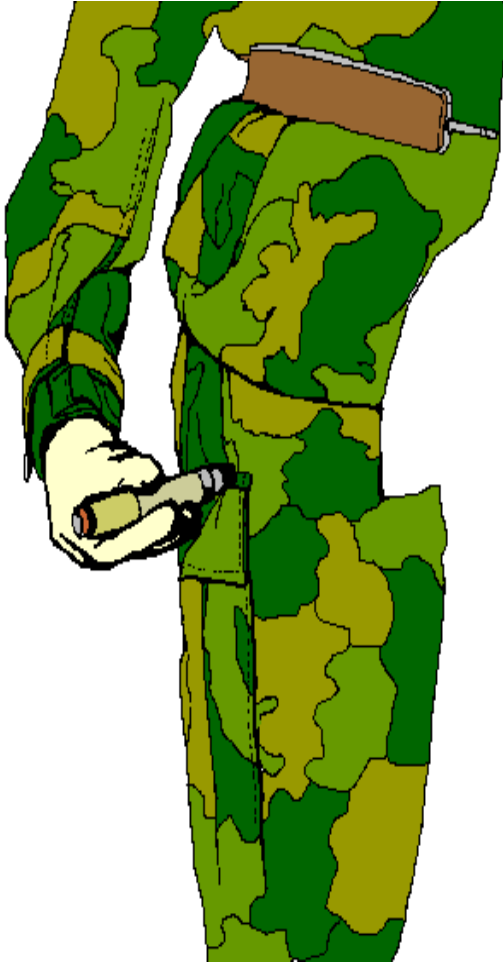
A



B



PROCEDURE FOR INJECTING 2-PAM CL



Next pull the 2 PAM Cl injector (the larger of the two) out of the clip. Ensure that the grey safety cap has been removed. (The cap should remain in the clear plastic clip – see Figure 1.)

Inject yourself in the same manner as you did with the Atropine, holding the black (needle) end against your outer thigh (or buttocks).

Massage the injection sites, as time permits.

After administering one set of injections, you should initiate decontamination procedures, as necessary, and put on charcoal lined protective clothing.

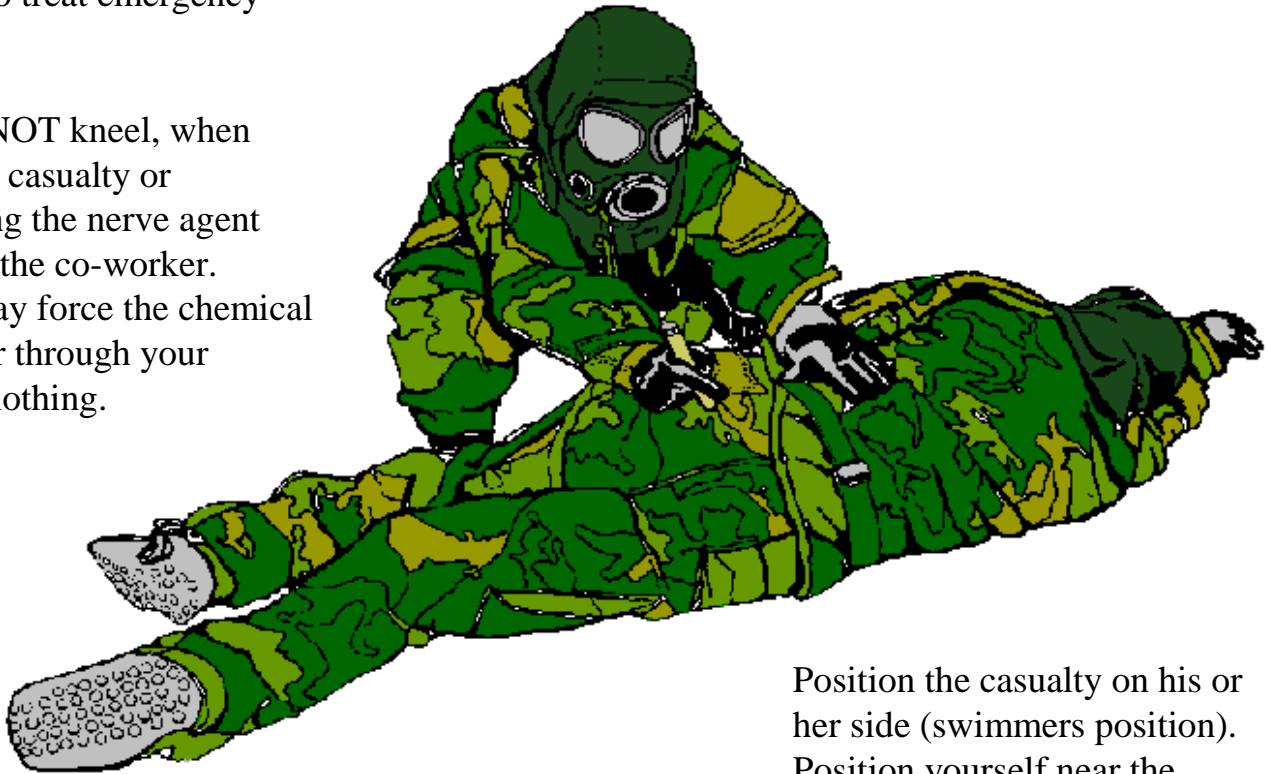


Figure 1

INJECTING THE CASUALTY'S BUTTOCKS

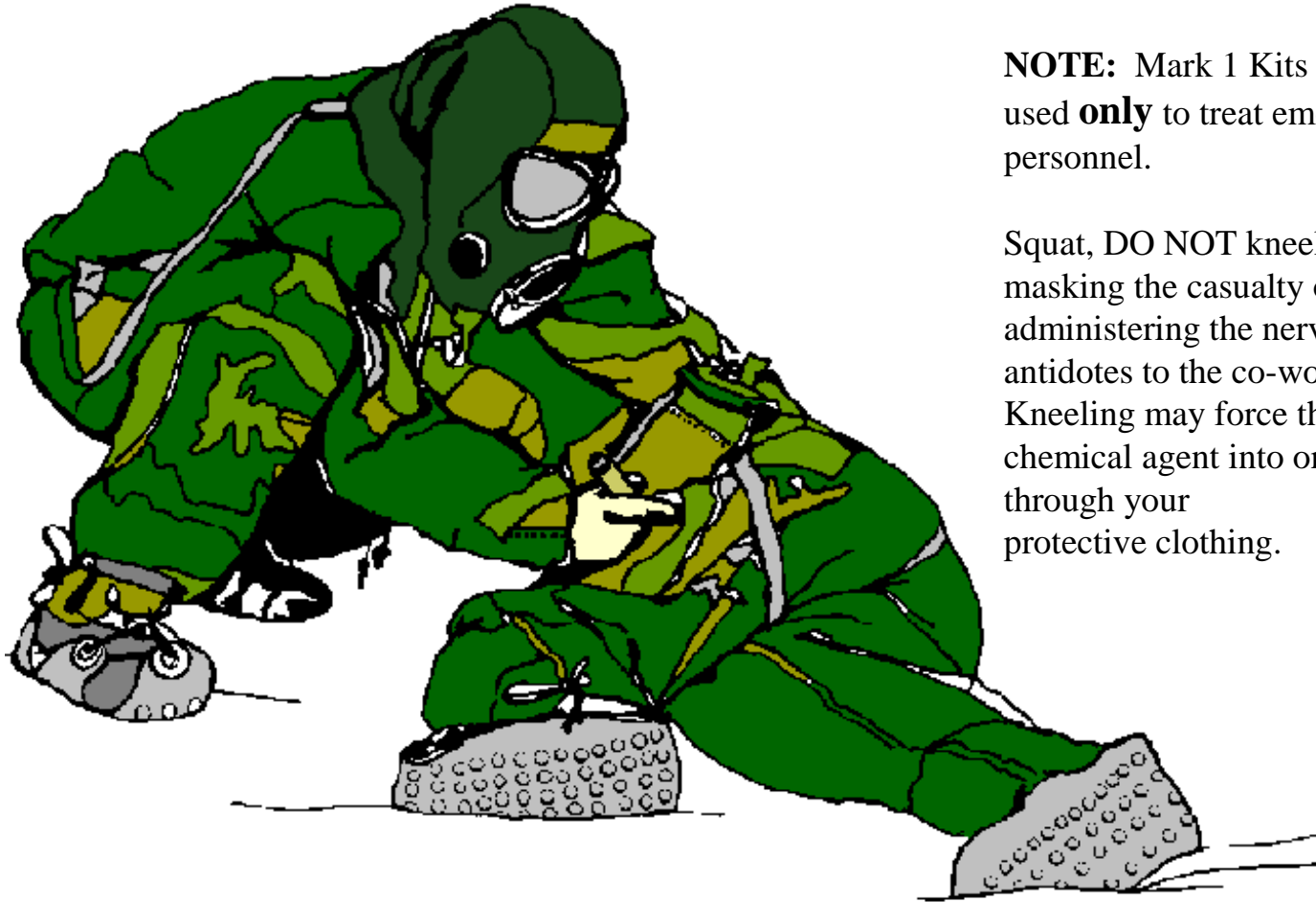
NOTE: Mark 1 Kits are to be used **only** to treat emergency personnel.

Squat, DO NOT kneel, when masking the casualty or administering the nerve agent antidotes to the co-worker. Kneeling may force the chemical agent into or through your protective clothing.



Position the casualty on his or her side (swimmers position). Position yourself near the casualty's thigh.

INJECTING A CASUALTY'S THIGH



NOTE: Mark 1 Kits are to be used **only** to treat emergency personnel.

Squat, DO NOT kneel, when masking the casualty or administering the nerve agent antidotes to the co-worker. Kneeling may force the chemical agent into or through your protective clothing.

NERVE AGENT INJURY - OVERVIEW

- If you, as well as personnel in your immediate area, present with signs and symptoms of mild to moderate Nerve Agent Injury, administer one Mark 1 Kit **immediately**.
- The effect of atropine administration on MILD and MODERATE cases of nerve agent poisoning may help confirm the diagnosis.
- If you have absorbed little or no nerve agent, the administration of a single dose of 2 mg of atropine will produce symptoms of mild Atropinization (tachycardia & dry mouth).
- When in doubt, error on the side of caution when presented with signs and symptoms of Nerve Agent Poisoning.

ADMINISTER ONE MARK 1 KIT



Mnemonic for Nerve Agent Exposure	
D	– Diarrhea
U	– Urination
M	– Miosis
B	– Bradycardia, Bronchorrhea, Bronchospasm
E	– Emesis
L	– Lacrimation
S	– Salivation, Sweating



Nerve Agent Injury - Reference Material

- US Army Medical Research Institute of Chemical Defense
<http://ccc.apgea.army.mil/courses/distance/cbt.htm>
- Advanced Topics on Medical Defense against Biological and Chemical Agents
<http://www.swankhealth.com>
- NBC – Med: NBC Online Medical Information Server
<http://www.nbc-med.org>
- USAMRIID Bio-Treatment Handbook
USAMRIID Medical NBC Battlebook
NBC Field Handbook - US Army
NBC Protection - US Army
NBC Decontamination - US Army
NBC Field Training Exercise - US Army
Medical Aspects of NBC
Emergency Response to Terrorism
Nerve Agent Overview – Recognition / Pathophysiology / Treatment
<http://www.sc-ems.com>

