Chapter 5

RIOT-CONTROL AGENTS

Summary

NATO Codes: CN, CS, CR, OC, DM

Signs and Symptoms: Burning and pain on exposed mucous membranes and skin, eye pain and tearing, burning in the nostrils, respiratory discomfort, and tingling of the exposed skin. DM will cause prolonged periods of vomiting and a feeling of malaise.

Detection: No field detector is available for any of the riot-control agents.

Decontamination: *Eyes:* Thoroughly flush with water, saline, or similar substance. *Skin (CS, CN, CR, DM):* Flush with copious amounts of water, soap and water, or a mildly alkaline solution (sodium bicarbonate or sodium carbonate). Generally, decontamination is not needed if the wind is brisk. *Skin (OC):* The pain from OC will increase with water, especially warm water. It is best decontaminated with baby shampoo, milk, alcohol, or vegetable oil. Without decontamination pain will subside over time.

Management: Usually none is necessary; effects are self-limiting and diminish or cease within 45 minutes. DM is the exception; its effects may last several hours.

Overview

Riot-control agents irritate the skin, mucous membranes, and airways, causing individuals to be unable to perform their normal duties as a result of the discomfort. Riot-control agents have been called irritants or tearing agents and are typically characterized by a very low toxicity and short duration of action. In rare cases, serious injuries may occur.

Chloropicrin (a lacrimator that can be life-threatening) was initially synthesized in 1848 and was used in World War I as a tear gas and insecticidal fumigant. Farmers have used chloropicrin to eradicate soil-borne diseases and pests before a crop is planted for more than 50 years.

CS, CR, CN, and OC are agents frequently used today for riot control because of their high safety ratio (the lethal dose far exceeds the dose needed to cause irritating effects). OC is commonly used by police with individuals and small crowds, and CS is used for dispersal of large crowds. CS is sometimes used for military mask confidence training. Exposure to riot-control agents has occurred during the excavation of buried containers of agent on military reservations, and also when individuals have entered areas where large amounts of agent were previously released and the residue remained.

Physical Characteristics

As a group, the riot-control agents CN, CS, CR, and DM are solid crystalline powders that can be suspended in a liquid and aerosolized. Oleoresin capsicum (OC), from cayenne peppers, is not a solid but a resin that can be mixed in a liquid solution. Table 5-1 lists characteristics of these agents.

Detection

There are no detectors for riot-control agents.

Table 5-1. Riot-Control Agent Characteristics

Agent	Other Names	Physical Properties at Standard Temperature	Dispensing Method, Color, Odor
CN	Mace (Mace Security International, Cleveland, OH)	aerosolized crystalline solid	Liquid spray (with solvent), explosive dispersal or in a smoke-generating mixture. White smoke cloud. Odor like apple blossoms.
CS		aerosolized crystalline solid, flammable	Liquid spray (with solvent), explosive dispersal, or smoke-generating mixture. White smoke cloud. Pungent pepper odor.
CR		white or yellow solid	Aerosolized powder from grenades or added to a liquid solution. White cloud and powder produced. Pepper-like odor.
DM	adamsite	yellow-green crystalline solid	Explosive dispersal or particulate smoke from a heat-generating device. Canary yellow cloud. Colorless as it dissipates. No odor. Irritating to airways.
OC	pepper spray	Sticky resin suspended in a solvent	Liquid or foam spray. Colorless resin suspended in solvent. Odorless unless scented.

Effects

The agents CN, CS, and CR irritate tissue immediately, causing the eyelids to spasm shut and producing temporary discomfort, including pain in the eyes, copious tearing, sneezing, and a heavy nasal discharge. Airway irritation causes coughing and shortness of breath. Exposure to significant amounts of CN, CS, or CR

can cause skin redness and blistering. DM is unique in that its effects are delayed for several minutes, and exposure will cause skin discomfort, vomiting, and mental malaise and depression. OC is unique in its mechanism of action. OC contains capsaicin in large concentrations, which causes the mass release of the neurotransmitter substance P. This causes an overwhelming sensation of pain until the body's store of substance P is depleted.

Self-Aid and Buddy Aid

The first action is to remove the individual from the aerosolized cloud of CN, CS, CR, or DM. A wet cloth over the nose and mouth can help reduce the number of aerosolized particles inhaled. Don a protective mask if available. Special protective clothing is not essential. Street clothing that covers the arms and legs will help to protect the skin from contact with the agent. If an exposure occurs in a well-ventilated area, severe skin and lung irritation is unlikely. High-dose exposure, for example, when an individual is in the agent cloud for prolonged periods in a confined space, can cause skin blistering, upper airway difficulties, and laryngospasm if protective garments and respirators are not worn. In large doses, DM will cause vomiting and mental depression lasting for several hours after exposure. OC is dispensed as a liquid or foam spray containing resins that stick to the skin. Dabbing the agent with a cloth may help to reduce the amount of OC resin on the skin. The pain from OC will recede over time without decontamination.

Care Provider Actions

Medical treatment provided by the care provider reinforces self-aid. Normally the eyes will become bloodshot and red. Wash the eyes with baby shampoo and rinse with copious amounts of water to help reduce the eye pain. If particles of a crystallized agent get into the eye, irrigate with copious amounts of water and treat with antibiotic eye ointments. Pieces of exploding canister can also damage the eye. Treat impaction cases according to eye injury protocols with direct follow-up by an ophthalmologist. Open blisters on the skin can be irrigated with sterile saline and

covered with antibiotic ointment. Inhalers and supplemental oxygen should be administered to patients with exacerbated breathing difficulties, such as asthmatic conditions. Irritated skin can be washed with a mild baking soda solution to normalize pH.

Casualty Decontamination

No decontamination is required with most exposures to CN, CS, CR, or DM. To remove the dry agent from clothing and hair, individuals should move briskly in a well-ventilated area with eyes and mouth closed, while flapping their arms and rubbing their hair. After heavy exposures, individuals can decontaminate themselves with soap and water, although water may reactivate OC on the skin and cause pain. A continuous water flow must be used. For OC decontamination, it is best to wash with baby shampoo, milk, or vegetable oil to help break up the resin and neutralize the agent's action.