First Responder's Guide to Weapons of Mass Destruction

Terminology

CBRN

Chemical, Biological, Radiological, Nuclear agents/weapons

Chemical Agents

Typically man-made chemical compounds

Biological Agents

Bacteria or viruses that are dangerous to the life or health of biological organisms, i.e. human beings

Radiological Hazards

Can occur from nuclear devices as well as a "dirty bomb," which disperses radiation by means of a non-nuclear device

Nuclear Hazards

Classical nuclear hazards are associated with radiation received in the aftermath of a detonation of a nuclear device

*Biological Warfare Agents**

**Note: List not all-inclusive.*

Agent	*Indications*	*Comments*
Anthrax	• Inhalational anthrax (most lethal form): sore throat, mild fever, muscle aches and malaise • Cutaneous anthrax: raised bump resembling spider bite within 1-2 days	Not contagious. Prophylactic inoculation available. Spores do not have a characteristic appearance (e.g., color), smell, or taste.
Botulism	• Symptoms begin within 6 hours to 2 weeks (most commonly 12 to 36 hours) after eating food that contains the toxins. • Double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, muscle weakness that descends from the shoulders down through the upper arms, lower arms, thighs, calves, etc.	Not contagious. Caused by a nerve toxin that is produced by the bacterium Clostridium botulinum. About 110 cases of botulism are reported yearly in the US.
Smallpox	• Fever, rash, small blisters on skin, bleeding of skin and mucous membrane, malaise, head and body aches, and sometimes vomiting. The fever is usually high, in the range of 101 to 104 degrees F. Incubation period: 10-12 days Onset of illness: 2-4 days later	Contagious. Prophylactic inoculation available. Direct and fairly prolonged face-to-face contact is required to spread smallpox from one person to another. Also can be spread through direct contact with infected bodily fluids or contaminated objects (bedding, clothing, etc.). Can be carried by air in enclosed settings such as buildings, buses, and trains.

Radiological Threats/Response

Definitions/Threats

Radiation is a form of energy that occurs naturally in the air we breathe, water we drink, food we eat and in our own bodies. Radiation doses that people receive are measured in "rem" or "sievert" (1 sievert = 100 rem).

Radiation cannot be seen, smelled, felt or tasted by humans. Discarding of contaminated clothes and washing your body reduces the amount of radioactive contamination in the body and thus effectively reduces your exposure.

Radiation adverse health effects may not be determined for many years depending on the amount, type, route and length of the exposure. The effects can range from mild to cancer and death.

Interior radiation—radiation that goes inside our bodies

Exterior radiation—radiation that comes from sources outside our bodies

Three basic ways to **reduce your exposure** to radiation—

Time: decrease the amount of time near the source of radiation

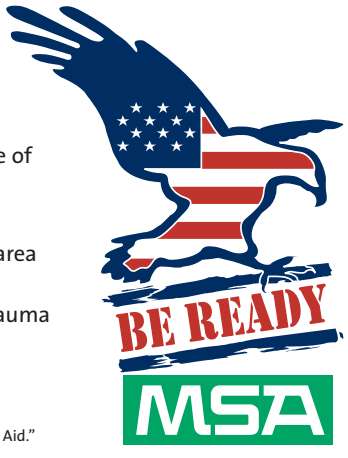
Distance: increase your distance from the radiation source

Shielding: increase the shielding between you and the radiation source

Dirty Bomb—Dirty bombs combine conventional explosives, such as dynamite, with radioactive materials to disperse radiation.

Sound Response Recommendations

- Position upwind of suspected event.
- Isolate/secure the area (DOT-ERG No. 136 recommends a minimum distance of 80 to 160 feet).
- Be alert for small explosives designed to disseminate radioactive agent(s).
- Use time, distance and shielding as protective measures.
- Use full PPE including SCBA.
- Avoid contact with agent. Stay out of visible smoke or fumes.
- Establish background levels outside of suspected area.
- Monitor radiation levels.
- Remove victims from high-hazard area to a safe holding area.
- Triage, treat and decontaminate trauma victims as appropriate.
- Detain or isolate uninjured persons or equipment. Delay decontamination for such persons/equipment until instructed by radiation authorities.
- Use radiation detection devices, if possible, to determine if patients are contaminated with radiological material.



Source: The Department of Justice, FEMA and the Fire Administration's "Emergency Response to Terrorism Job Aid."

Chemical Warfare Agents

Chemical/Agent Classes	Characteristics*	Exposure Symptoms*	Identifying Characteristics	MSA Detector Tubes
Chemical Nerve Agents Tabun Sarin Soman VX	Attack nervous system, can enter body through inhalation or skin Effect begin within seconds & minutes (large amounts) to 18 hours (small amounts)	• Pinpoint pupils • Runny nose • Drooling • Coughing • Tightness in Chest • Muscle twitching, jerking • Nausea, vomiting, diarrhea • Convulsions • Coma • Death	*Tabun*—Odor: None or fruity *Sarin*—Odor: None or fruity (used in Tokyo subway attack a few years ago) *Soman*—Odor: None or camphor (mothballs) *VX* —Odor: None or sulfur	10007654
Chemical Blister Agents Mustard Gas Lewisite	Attack skin and can also be inhaled Are absorbed rapidly into skin Skin effect varies with agent— *Mustard Gas:* no immediate effect *Lewisite:* immediate pain	• Itching of eyes • Nausea, vomiting • Hoarseness or hacking cough • Initial redness of skin, followed by blisters • Death	*Mustard Gas*—Odor: Garlic, onions or mustard. Color: Clear to yellow or brown *Lewisite*—Odor: Geraniums	10007652—HD *and* HN 10007653—HD *only* 10007650
Chemical Choking Agents Phosgene Diphosgene Chlorine	Attack respiratory tract Effects begin in 2-24 hours	• Coughing, nausea, vomiting • Irritated eyes, nose, throat • Shortness of breath • Pulmonary edema • Frothy secretions • Death	*Phosgene* —Odor: Newly mown hay	10007651
Chemical Blood Agents Hydrogen Cyanide Cyanogen Chloride	Attack circulatory system Have rapid onset Effects occur immediately *Small amounts:* no effects	• Effects occur immediately • Loss of consciousness • Convulsions • Apnea • Headache	*Hydrogen Cyanide*—Odor: Bitter almonds *Cyanogen Chloride*—Odor: Bitter almonds	10007651

*Note: Reaction times will vary depending on agent concentration and form (i.e., liquid or vapor).

MSA Equipment for First Responders

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For additional information, visit these Homeland Security Websites:

www.CDC.gov (Centers for Disease Control and Prevention)
www.DHS.gov (U.S. Department of Homeland Security)
www.FEMA.gov (Federal Emergency Management Agency)
www.redcross.org (American Red Cross)
www.disasterrelief.org (Disaster Relief)

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