Terrorist CBRN: Materials and Effects

**Chemical Agents**

Mustard

Mustard is a yellowish liquid at room temperature and has a pungent odor. Mustard is not commercially available, but its components can be easily produced or obtained chemicals, toxins, or industrial or medical sources. Usama Bin Ladin's al-Qa'ida has openly expressed its desire to produce mustard for use in future attacks. Although mustard causes injury rather than death, it can cause significant medical problems, such as severe damage to skin and respiratory tract.

**Biological Agents**

Anthrax

Anthrax, caused by Bacillus anthracis, is a disease that affects animals and humans. It can be spread through contact with contaminated soil, air, or water. Anthrax is one of the most dangerous biological weapons known, as it has a high potential for causing mass casualties. Anthrax can be disseminated in an aerosol or used to contaminate food and water. Once inhaled, anthrax can cause severe illness and death. Medical treatments are the same as for military-grade anthrax.

**Other Biological Agents**

Botulinum toxin, first used as a pesticide, is a potent nerve poison that is highly lethal. It is produced by the bacterium Clostridium botulinum, which occurs naturally in soil, water, and food. This form of the disease, which is called botulism, can be caused by eating contaminated food or drinking contaminated water. Botulinum toxin would be effective in small-scale attacks in Europe with easily produced chemicals. It has a short incubation period, with symptoms appearing within seconds to minutes. Medical treatments are available, but they need to be administered quickly to prevent death.

**Nerve Agents**

Sarin and VX are high-potency nerve agents that disrupt a victim's nervous system by blocking the transmission of nerve signals. Sarin is a colorless-to-pale yellow liquid that has a characteristic odor of bitter almonds. VX is a colorless liquid that has no odor. Both agents cause severe neurological symptoms, including vomiting, diarrhea, and respiratory failure. Medical treatments are the same as for nerve agent poisoning. Exposure to nerve agents causes pinpoint pupils, salivation, and convulsions that can lead to death. Medical treatments are available, but they need to be administered quickly to prevent death.

**Toxic Industrial Chemicals**

There are a wide range of toxic industrial chemicals that can be used as terrorist weapons. These agents—such as chlorine, phosgene, and other industrial chemicals—can be used in much larger quantities to compensate for their lower toxicity. These agents are transported in multiton shipments by road and air and can be used to contaminate water supplies, food, and air. Analysis of an al-Qa'ida document recovered in Afghanistan in summer 2002 indicates the group has developed procedures for making industrial agents, such as chlorine gas.
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**Chemical Warfare Agents**

- **VX**: A nerve agent that produces choking and respiratory symptoms. It is highly toxic and can cause death if not treated promptly.
- **Cyanide**: A poison that disrupts the normal functioning of the cells, leading to respiratory failure and death. It is also used as a lethal injection drug.
- **Sarin**: A nerve agent that affects the central nervous system, causing respiratory paralysis and death. It is also used as a tear gas.
- **Mustard Gas**: A blister agent that causes severe burns to the skin, eyes, and lungs. It is also used as a herbicide.

**Biological Warfare Agents**

- **Bacillus anthracis** (anthrax): Causes an infectious disease that affects the skin, lungs, or intestines, leading to death if not treated.
- **Botulinum toxin**: A neurotoxin produced by the bacterium *Clostridium botulinum*, which causes paralysis and death.
- **Ricin**: A potent toxin extracted from castor beans, which can be used to produce an aerosol or liquid form.

**Radiological Warfare Agents**

- **Cesium-137** and **Plutonium-239**: Highly toxic and can cause severe radiation sickness and death. They are used in nuclear weapons.

**Nuclear Warfare Agents**

- **Nuclear bombs**: The most destructive form of nuclear weapons, capable of causing mass casualties and destruction.

**Military and Security Implications**

- The use of CBRN agents by terrorists can disrupt military operations, affect civilian populations, and cause economic and political instability.
- The development and proliferation of CBRN weapons by states and non-state actors pose significant threats to international security.

**Conclusion**

Understanding the capabilities and potential uses of CBRN agents is crucial for developing effective defense and countermeasures strategies.
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Background

The spectrum of terrorist CBRN threats includes a wide variety of potential agents and delivery means to disrupt the national and international transport system, to cause acts of terrorism or mass casualties, to degrade or disrupt large parts of the industrial infrastructure, to contaminate local environments, and to cause panic and disruption.

Terrorists have considered using a wide range of chemical, biological, radiological, and nuclear (CBRN) agents for attacks. The use of CBRN agents can be motivated by a number of tactical and strategic objectives, including inflicting mass casualties, spreading fear and panic, stimulating economic disruption, and incapacitating critical infrastructure. Terrorists have considered using CBRN agents to incapacitate critical infrastructures such as transportation systems, energy networks, and communications, among other potential targets.

Terrorists have considered using CBRN agents in a variety of scenarios, including those with significant local, regional, or international repercussions. The use of CBRN agents can also be motivated by political, religious, or ideological objectives, such as the eradication of a specific ethnic group or the spread of disease.

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There is no treatment for ricin poisoning after it has entered the bloodstream. Victims start to show symptoms within hours to days after exposure, depending on the dosage and route of administration.

Terrorists have looked at delivering ricin in foods and as a contact poison, although we have no scientific data to indicate that ricin can penetrate intact skin.

Ricin will remain stable in foods as long as they are not heated, and it will have few indicators because it does not have a strong taste and is off-white in color.

Radiological and Nuclear Devices

Radiological Dispersal Devices (RDD)

An RDD is a conventional bomb not a yield-producing nuclear device. RDDs are designed to disperse radioactive material to cause destruction, contamination, and injury from the radiation produced by the material. An RDD can be almost any size, defined only by the amount of radioactive material and explosives.

A passive RDD is a system in which unshielded radioactive material is dispersed or placed manually at the target.

An explosive RDD—often called a “dirty bomb”—is any system that uses the explosive force of detonation to disperse radioactive material. A simple explosive RDD consisting of a lead-shielded container—commonly called a “pig”—and a kilogram of explosive attached could easily fit into a backpack.

An atmospheric RDD is any system in which radioactive material is converted into a form that is easily transported by air currents.

Use of an RDD by terrorists could result in health, environmental, and economic effects as well as political and social effects. It will cause fear, injury, and possibly lead to levels of contamination requiring costly and time-consuming cleanup efforts.

A variety of radioactive materials are commonly used in RDDs, including Cesium-137, Strontium-90, and Cobalt-60. Hospitals, universities, factories, construction companies, and laboratories are possible sources for these radioactive materials.

Improvised Nuclear Device (IND)

An IND is intended to cause a yield-producing nuclear explosion. An IND could consist of diverted nuclear weapon components, a modified nuclear weapon, or indigenous-designed device.

INDs can be categorized into two types: implosion and gun assembled. Unlike RDDs that can be made with almost any radioactive material, INDs require fissile material—highly enriched uranium or plutonium—to produce nuclear yield.

Online Resources

More detailed information on the medical aspects of chemical, biological, and nuclear weapons devices can be found in the following Internet sites:

The Medical NBC Information server:

Dept of Nuclear and Radiological Defense:
www.nuclear.amc.army.mil

Geophysical and Atmospheric Sciences:
www.geophysics.army.mil

Chemical and Biological Defense:

Departments of Homeland Security:
www.ready.gov

Central Intelligence Agency:

National Institute for Occupational Safety and Health:
www.cdc.gov/niosh/topics/chemical-safety/default.html

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