



Please call 911 if you think you have a medical emergency.

How Biological Agents Are Delivered and Detected

Although there are more than 1200 biological agents that could be used to cause illness or death, relatively few possess the necessary characteristics to make them ideal candidates for biological warfare or terrorism agents. The ideal biological agents are relatively easy to acquire, process, and use. Only small amounts (on the order of pounds and often less) would be needed to kill or incapacitate hundreds of thousands of people in a metropolitan area. Biological warfare agents are easy to hide and difficult to detect or protect against. They are invisible, odorless, tasteless, and can be spread silently.

Delivery

Biological warfare agents can be disseminated in various ways.

- Through the air by aerosol sprays: To be an effective biological weapon, airborne germs must be dispersed as fine particles. To be infected, a person must breathe a sufficient quantity of particles into the lungs to cause illness.
- Used in explosives (artillery, missiles, detonated bombs): The use of an explosive device to deliver and spread biological agents is not as effective as the delivery by aerosol. This is because agents tend to be destroyed by the blast, typically leaving less than 5% of the agent capable of causing disease.
- Put into food or water: Contamination of a city's water supplies requires an unrealistically large amount of an agent as well as introduction into the water after it passes through a regional treatment facility.
- Absorbed through or injected into the skin. This method might be ideal for assassination, but is not likely to be used to cause mass casualties.

Detection

Biological agents could either be found in the environment using advanced detection devices or after specific testing or by a doctor reporting a medical diagnosis of an

illness caused by an agent. Animals may also be early victims and shouldn't be overlooked.

- Early detection of a biological agent in the environment allows for early and specific treatment and time enough to treat others who were exposed with protective medications. Currently, the US Department of Defense is evaluating devices to detect clouds of biological warfare agents in the air.
- Doctors must be able to identify early victims and recognize patterns of disease. If unusual symptoms, a large numbers of people with symptoms, dead animals, or other inconsistent medical findings are noted, a biological warfare attack should be suspected. Doctors report these patterns to public health officials.

Protective measures

Protective measures can be taken against biological warfare agents. These should be started as soon as a biological agent is suspected (if enough warning is received).

- **Masks:** Currently, available masks, such as the military gas mask or high-efficiency particulate air (HEPA) filter masks used for tuberculosis exposure, filter out most biological warfare particles delivered through the air. However, the face seals on ill-fitting masks often leak. For a mask to fit properly, it must be fitted to a person's face.
- **Clothing:** Most biological agents in the air do not penetrate unbroken skin, and few organisms stick to skin or clothing. After an aerosol attack, the simple removal of clothing eliminates a great majority of surface contamination. Thorough showering with soap and water removes 99.99% of the few organisms that may be left on the victim's skin.
- **Medical personnel protection:** Health care providers treating victims of biological warfare may not need special suits but should use latex gloves and take other precautions such as wearing gowns and masks with protective eye shields. Victims would be isolated in private rooms while receiving treatment.
- **Antibiotics:** Victims of biological warfare might be given antibiotics orally (pills) or through an IV, even before the specific agent is identified.
- **Vaccinations:** Currently, protective vaccines (given as shots) are available for anthrax, botulinum toxin, tularemia, plague, Q fever, and smallpox. The widespread immunization of nonmilitary personnel has not been currently recommended by any governmental agency. Immune protection against ricin and staphylococcal toxins may also be possible in the near future.

For more information, read the complete article, Biological Warfare

(<http://www.emedicinehealth.com/script/main/art.asp?articlekey=58836>) on <http://www.emedicinehealth.com>.

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