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Should Anthrax Vaccine Be Tested in Children?


AP
Investigators outside the Dirksen Senate Office Building in Washington in October 2001

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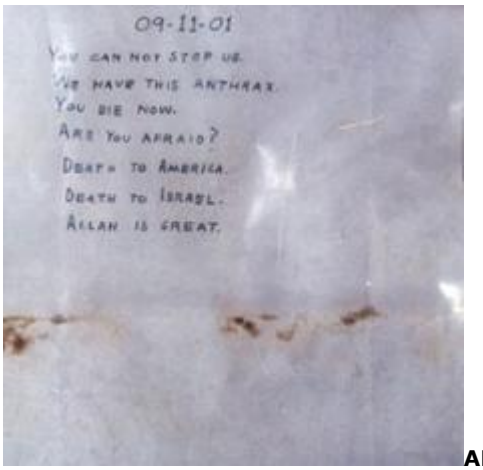
BARBARA KLEIN: This is SCIENCE IN THE NEWS in VOA Special English. I'm Barbara Klein.

CHRISTOPHER CRUISE: And I'm Christopher Cruise. Today we tell about the deadly disease anthrax.

(MUSIC)

BARBARA KLEIN: Ten years have passed since letters containing anthrax bacteria passed through the mail in the United States. The anthrax particles looked like harmless white powder. But the bacteria killed five people.

No one knew who mailed the letters. News organizations and congressional offices were the main targets. And, the anthrax particles also found their way to the home of a ninety-four-year-old woman.



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The letter containing anthrax that was sent to the office of the Senate majority leader

Years later, federal investigators named a scientist, Bruce Edwards Ivins, as the only suspect in the murders. He was an anthrax expert who worked at the biological defense center in Maryland, where the bacteria was kept. The government was preparing to charge him when he killed himself in two thousand eight.

CHRISTOPHER CRUISE: Recently, an investigation requested by Congress suggested that Bruce Ivins may have been falsely suspected. Other investigators and news organizations also have studied the case and questioned the evidence against Mr. Ivins.

Government lawyers say there is no reason for debate. The lawyers say they know they found the right person. But questions about the case have caused concern among some people. They believe that if Bruce Ivins was innocent, the person who sent the letters containing anthrax might still be free.

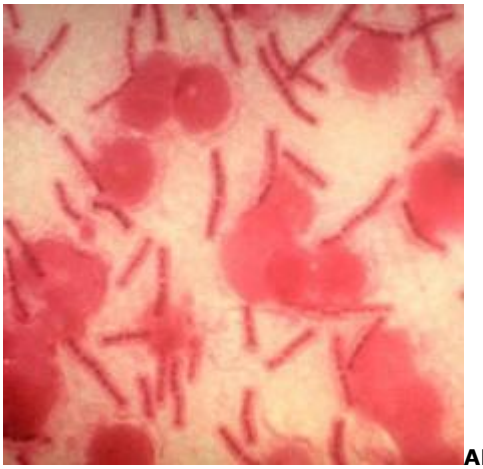
BARBARA KLEIN: Anthrax also is the subject of another current debate. An expert advisory committee has proposed testing a vaccine against anthrax on children. Currently, medical workers are giving the vaccine to some adults. But it has not been tested on children. The goal of the possible testing would be to learn if children could be protected from the disease in the event of a terrorist attack.

The National Biodefense Science Board proposed the testing to the United States Department of Health and Human Services. The board noted the ethical questions involved. But it said it would suggest approval of the tests if those questions could be settled.

Some health-activist groups and others immediately protested the possible tests. The Obama Administration has said the issue will remain under study.

CHRISTOPHER CRUISE: The anthrax vaccine has been available for years on a limited basis. It is given mainly to members of the armed forces. More than two million armed forces members have had the vaccine. It is generally considered safe. But there have been protests about unexpected side effects. People who work with animals also can be vaccinated against anthrax.

Anthrax cannot be passed from one person to another. However, anthrax affects cattle and other creatures that eat plants. It also can affect people who deal with infected animals or animal products.



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A microscopic view of stained anthrax bacteria

Anthrax is found naturally in the environment. It is caused by the bacterium Bacillus anthracis. The bacteria have spores or protective coverings. Spores are like seeds. They can live for hundreds of years in the soil. They can survive through severe heat, dry weather, and other extreme conditions.

(MUSIC)

BARBARA KLEIN: Anthrax can be found anywhere in the world. It is most common in developing countries. Animals can get the bacteria while eating plants. That can loosen anthrax spores in the soil. The animal eats or breathes in the spores and may become infected. But a vaccine can protect animals.

In people, the disease can appear in three forms: cutaneous anthrax, intestinal anthrax and inhalation anthrax.

Cutaneous anthrax is the most common kind of infection. People can become infected this way if the bacteria enter through a cut in the skin. The disease is most often found among people who work with infected animals or animal products. Cutaneous anthrax causes a painful, black area on the skin. However, it rarely causes death.

CHRISTOPHER CRUISE: Intestinal anthrax results from eating infected meat. It can cause high body temperature, stomach pain and expulsion of food from the stomach. It often can be cured.

The most severe form of the disease is inhalation anthrax. This happens when a person breathes the spores into the lungs. Inhalation anthrax is most often found among people who work with animal hair and wool in areas where the disease affects animals.

Inhalation anthrax is deadly if a person breathes in thousands of extremely small spores. Large spores may get caught in the nose or throat, where they are less dangerous. But the small spores can travel to the lungs.

BARBARA KLEIN: The body's natural defenses against disease attack some spores. But they carry others to the lymph nodes in the chest. Once there, the spores change into a deadly form. The bacteria grow and spread to the rest of the body.

This may take a day, a week or up to two months. As infection spreads to the rest of the body, the bacteria produce poisons that enter the blood. These poisons can cause a build-up of fluids in the lung, tissue destruction and death.

CHRISTOPHER CRUISE: Doctors treat infected people with antibiotic medicines. Antibiotics have proven effective in fighting the disease in most cases. They can treat the disease if it is discovered early. The antibiotics ciprofloxacin penicillin and doxycycline are all effective treatments.

An anthrax infection is especially dangerous because people do not know they have been infected until symptoms appear. Signs of the disease usually appear within a few days. Chest X-rays can help doctors tell if a person has inhaled anthrax.

Early symptoms are similar to the disease influenza. They may include high body temperature, muscle pain and a cough. These are usually followed by severe breathing problems and death if the disease is not treated.

BARBARA KLEIN: Anthrax spores are hard to kill. Antibiotics halt the development of the disease by fighting the bacteria as they grow from the spores. However, antibiotics do not fight the poisons that the bacteria produce.

To work best, the antibiotics need to be active in the blood for as long as spores might be present in the lungs or in other places in the body. Health officials say people should take antibiotics for an extended period to treat or protect against anthrax infection.

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CHRISTOPHER CRUISE: Anthrax is considered a major threat because of its ability to be used as a biological weapon. Biological weapons are living microorganisms. Biological and chemical agents are most effective when they are spread into the air. These agents are often placed in bombs or artillery shells that are designed to explode into the air and spread poisons over an enemy.

Many biological and chemical agents have no color, smell or taste. So an attack could take place without the victims knowing it.

Experts say anthrax is one of the easiest biological agents to manufacture. It can be grown in a laboratory. It spreads easily through the air over a large area. It can be made into a form that is easily inhaled. It is easily stored and is dangerous for a long period of time. It also costs very little to make.

BARBARA KLEIN: Anthrax has been used in laboratory experiments for more than one-hundred years. Many scientists have used anthrax for traditional research purposes. The bacteria also have been genetically changed for biological weapons research. The United States and countries of the former Soviet Union have experimented with anthrax in their biological weapons programs.

Anthrax spores in nature stick together in particles too large to be breathed in. Experts say that the individual anthrax spore is extremely small, about one micron wide. For example, two-thousand spores lined up would measure only two millimeters. Particles that are five microns or bigger are usually trapped in the upper part of the respiratory system.

To be an effective weapon, anthrax spores are reproduced to be smaller than five microns. Experts say making such anthrax spores requires special laboratory equipment and a great deal of skill. And to many people, that is a very good thing.

(MUSIC)

CHRISTOPHER CRUISE: This SCIENCE IN THE NEWS program was written by Cynthia Kirk and Jerilyn Watson. I'm Christopher Cruise.

BARBARA KLEIN: And I'm Barbara Klein. You can find transcripts, MP3s and podcasts of our programs at voaspecialenglish.com. And you can find us on Twitter and YouTube at VOA Learning English. Join us again next week for more news about science in Special English on the Voice of America.