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Anthrax: Questions and Answers

Q: How do people get anthrax?

A: People can catch anthrax from infected animals or contaminated animal products. Most natural infection comes from skin contact. In the past, industrial wool sorters were at high risk of infection. You can also get anthrax infection from eating raw or too-rare meat - but this is uncommon. Even more uncommon - but by far most deadly - is anthrax caught by inhaling spores. This is because a person has to inhale several thousand spores before infection can take hold. Until the recent case in Florida, there hadn't been a case of inhalation anthrax in the U.S. since 1978.

Q: What is anthrax?

A: Anthrax is an animal disease that has been around for tens of thousands of years. Rarely, anthrax causes serious disease in humans. The germ is a bacterium called *Bacillus anthracis* that "seeds" itself by forming long-lasting spores. These spores can survive in the environment for a long time. Grass-eating animals, such as cattle, are most often infected because they can eat spores living in the soil. Animal vaccination - and destruction of infected herds - has drastically reduced the number of infected animals. Even so, anthrax spores continue to be found in soil samples from all over the world.

When anthrax spores get inside the body, they grow rapidly. The germs themselves can cause dangerous infections. Far more dangerous is a substance they produce in the body - anthrax toxin - which helps the bug survive by killing off cells of the immune system. This toxin is so deadly that it can kill even after infection is brought under control.

Q: What symptoms should I watch for?

A: The symptoms of anthrax infection depend on how a person catches the disease. All forms of anthrax if caught early enough can be cured by prompt antibiotic treatment. However, some anthrax strains developed as biological weapons are resistant to many drugs.

Skin infection starts with an itchy bump like a mosquito bite. After a day or two, it forms a small liquid-filled sac. This sac then becomes a painless ulcer with an area of black, dead tissue in the middle. Antibiotic treatment cures this infection. Untreated, it kills about one in five people.

The signs of intestinal infection are nausea, loss of appetite, and vomiting. This is followed by severe abdominal pain, vomiting of blood, and severe diarrhea. Untreated intestinal anthrax is deadly 25% to 60% of the time.

Inhalation anthrax, the most deadly form of the disease, begins with the same symptoms as a common cold. As early as one day after these symptoms appear - but up to weeks later - the symptoms suddenly become much more severe, usually with breathing problems and shock. This form of the disease is often fatal.

Q: How is anthrax treated?

A: First, anthrax infection has to be identified. This is now much more likely since the CDC began a program to help public-health laboratories rapidly identify germs that might be used in biological warfare or terrorism.

Early treatment is essential. Natural strains of anthrax may be resistant to many antibiotics, but most are sensitive to penicillin. Either of two antibiotics is recommended: doxycycline and Cipro (ciprofloxacin). Because anthrax spores can stay hidden in the lungs for a long time, antibiotic treatment should continue for 60 days. There are reports that some forms of anthrax created as biological weapons are resistant to these drugs, but there is no hard evidence that this is true.

People should NOT stockpile antibiotics. Antibiotic treatment should not be started unless public health authorities have warned of an anthrax outbreak, and even then these drugs can have serious side effects for some people.

More help is on the way. Researchers at Harvard University have invented molecules that work as an antidote for anthrax toxin. One of these molecules also vaccinates against future infection at the same time.

Q: Should I stock up on antibiotics to protect my family and me?

A: Definitely not. Why? Unless there is an announced outbreak of anthrax, there's no reason to suspect that those cold symptoms you are having are anything but that - a common cold. Antibiotics won't help if you have a cold or the flu. So if you start taking antibiotics - and then stop when the threat has passed - you are letting other germs in your body develop resistance to these important drugs. Then the medicine might not work when you really need it. And here's another reason: antibiotics can be dangerous to some people, and must be used as directed. These important medicines should only be used with medical supervision. The odds of a bad reaction are small - but they are much greater than the odds of an anthrax attack.

Q: What *can* I do? Would gas masks or bottled water help?

A: If anthrax is ever used as a weapon, it is unlikely that you would know an attack was under way in time to use a gas mask or respirator. In any event, it's much more likely that you or your children would be injured by improper use of gas masks than by a terrorist attack.

Only preventive treatment with antibiotics can keep an exposed person from developing anthrax.

Q: Are the South Florida cases different from the anthrax found in the environment?

A: Final tests aren't in. Because inhalation anthrax is very, very rare - the last U.S. case was in 1978 - officials believe it highly unlikely that the Florida cases came from a natural source like the environment. State and federal investigators are conducting a criminal investigation. However, the strain of anthrax in this outbreak remains highly susceptible to antibiotics, suggesting that it was not created in a sophisticated bioweapons laboratory.

Q: Have Americans been infected with anthrax before?

A: Human anthrax is a rare disease. There were only 18 cases of inhalation anthrax in the U.S. from 1900 through 1978. There were 224 U.S. cases of skin infection between 1944 and 1994. However, the African nation of Zimbabwe experienced a terrible epidemic of skin anthrax with more than 10,000 cases between 1979 and 1985. Gastrointestinal anthrax is very rarely reported.

Q: How is anthrax turned into a weapon for bioterrorism?

A: Anthrax has been called the perfect germ for bioterrorism. This is because it isn't contagious - only those exposed to a release of spores get sick - so there's no chance that a release of the

germs will boomerang and kill unintended victims. The spores last for a long time. During World War II, the British army experimented with an explosive shell filled with anthrax spores. These experiments took place on an island off the coast of Scotland. Spores persisted in the environment for 36 years. A massive decontamination effort finally cleared the region in 1987.

Even so, it's not easy to grow deadly anthrax and it's even harder to make it into a weapon. The spores have to be turned into a microscopically fine powder - no simple trick. Then the powder must be sprayed over a large area with a specially adapted device. Even then, the temperature and the wind must be exactly right to contaminate populated areas. One expert told WebMD that a terrorist would have to be very lucky to successfully deploy anthrax as a weapon of mass destruction.

Q: Where did the anthrax in South Florida come from?

A: A massive federal investigation is trying to find out. Researchers are looking at the problem in two ways. First, they will try to grow anthrax isolated from the first patient to see how it behaves. Next, they will examine its DNA for unique patterns. Using this data, the Florida anthrax strain will be compared to similar information from anthrax strains studied in laboratories around the world. Of course, there's no guarantee that this will lead investigators to the bug's ultimate source.

There's some good news. The anthrax in Florida remains sensitive to antibiotics, suggesting that it did not come from a sophisticated biological weapons laboratory. And very few people were exposed, suggesting that the anthrax spores were not spread in a way that would be useful to terrorists.

Q: Who should I contact in my local area if I'm worried?

A: Contact your local and state health departments, **or your doctor**, for more information if you think you may have been exposed to anthrax. Don't start taking antibiotics unless advised to do so by your doctor or by health authorities.

WebMD has a lot more information - check out the links below. On the Internet, the Center for Civilian Biodefense at Johns Hopkins University has a wide range of information at <http://www.hopkins-biodefense.org>. Also see the latest bulletins from the CDC at <http://www.cdc.gov>.

Medically reviewed by [Dr. Michael Smith](#), Senior Medical Editor, WebMD, October, 2001.