Three Anthrax Inhalation Cases In Florida, FBI Opens Criminal Probe and Nano Bomb Update

Bacillus anthracis, anthrax bacteria, can form stable spores that are resistant to harsh conditions and extreme temperatures. Photomicrograph courtesy University of Michigan.

Earthfiles, news category.

Update - October 10, 2001 Boca Raton, Florida -

The third employee at American Media, Inc. in Boca Raton (Lantana), Florida has tested positive for exposure to an anthrax bacteria known as the Ames strain after an Ames, Iowa bacteria found in the tissue of a dead animal in the early 1950s. The other two cases are also the Ames strain which has been distributed over the past half century to many medical researchers to make anthrax vaccines. The 35-year-old woman is being treated with antibiotics. The FBI says there is no evidence to link the three anthrax cases to terrorists, but has now shifted its investigation to a criminal probe. The consensus is that the anthrax bacteria have an "unnatural source," which implies manipulation at least by someone with malicious criminal intent, if not terrorists.

American Media's Chief Executive, David Pecker, told CNN, "I think this is an attack against America. The World Trade Center was attacked, the Pentagon was attacked, and American Media was attacked, and I think this is the first bioterrorism attack in the United States." His company publishes *The Sun* and *National Enquirer* tabloids and the switchboard has received calls from readers who are afraid to touch his newspapers for fear of anthrax contamination. Mr. Pecker explained there is no risk and that his newspapers are not printed in the

Florida editorial offices.

Earlier today, Florida Department of Health spokesman, Frank Penela, said no more traces of anthrax bacteria have been found beyond the computer keyboard used by Sun photo editor, Robert Stevens, who died Friday, October 5.

October 8, 2001 Boca Raton, Florida - For the first time since the mid-1970s, two cases of "inhalation anthrax" caused by breathing in bacteria spores have been confirmed in two Florida men. First was 63-year-old Robert Stevens who died Friday. He was a photo editor for *The Sun*, a tabloid newspaper published along with the *National Enquirer* at American Media, Inc. in Lantana near Boca Raton, Florida. Traces of anthrax were also found on the computer keyboard used by Robert Stevens at his American Media office. His home was close to the air strip where September 11th hijacker, Mohammed Atta, rented planes.

The second man who tested positive for exposure to anthrax is Ernesto Blanco, 73 years old, who worked in the mail room at American Media.This second anthrax case was confirmed after Ernesto Blanco was admitted to Cedars Center Hospital in Miami-Dade County last week and treated for pneumonia. He went home, but returned to the hospital. The fact that Blanco worked in the same office building as Stevens caught the attention of investigators who were checking intensive care units and morgues in southern Florida. So, they gave him a nasal swab test and it was positive for anthrax.

Medical experts say that inhalation anthrax rarely occurs naturally. More commonly, humans contract anthrax bacteria from contaminated soils or animals through skin cuts or in food or water. But with terrorism on everyone's mind, this afternoon I talked about these surprising cases with Dr. Donald Henderson, Professor of Medicine and Public Health, and Director of the Center for Civilian Biodefense Studies at Johns Hopkins University in Baltimore, Maryland.

Interview:

Donald A. Henderson, M. D., Professor of Medicine and Public Health, Johns Hopkins University and Director, Center for Civilian Biodefense Studies, Baltimore, Maryland: "We've got a strange phenomenon in a sense in that we have an individual from whom anthrax has been isolated from his nose, nasal passages. He is ill, but the illness according to what I hear look at all like anthrax.

This is the second case?
The second case. The first case died and certainly the clinical picture of everything I heard about there sounded very much like anthrax. I don't know whether an autopsy has been done, so I don't know what they have seen.

This second case is very strange in that it's sort of like someone is carrying the organism now. That information might be wrong in time, but at the moment doesn't look like it. So, we have something that looks a little more ominous with the second isolate. But on the other hand, it's such a strange phenomenon and

secondly, we have now looked at the organism and it's a pretty common ordinary garden variety anthrax that we have out in the central plains where animals are infected. It's very sensitive to all antibiotics. It's not some weird engineered bacterium at all. And one wonders at this point just WHERE this could possibly have come from or what might have happened.

How it got there? How this particular strain got into one man's lung, into someone else's nose and on to a computer keyboard is what our mystery is at this point in time. As I say, once we get a lot more in samples from around that area, we have a chance to look at each of those three strains and compare them are they the same? And I think we'll have more information as we look at this particular patient and get a little more sense is this an anthrax infection, or is he just a carrier of it? And I'm not sure that given all of this that I'm at all sure just how all this happened.

If the man was breathing in anthrax in any amount, one would expect this would be turning up in the lung. But it certainly does not seem to be. I think there are a number of things yet that we need to wait to find out about before we're ready to jump to any conclusions.

But he did go to the hospital with what they thought was pneumonia?
That's right.

Wouldn't that mean that whatever was found in the nose would be in the lungs as well?
No, actually inhalation anthrax does not usually cause pneumonia. People think of this being anthrax pneumonia. In fact, it's a growth of the organism in the center of the chest outside the lungs. What happens is that the spore of anthrax goes into the deep part of the lungs and is picked up by a white cell and migrates into the center of the chest. And at some point, that spore begins to grow and grows very rapidly and it produces poisons or toxins. And the individual may feel like he has pressure in his chest. He may have some trouble breathing, but he does not normally have a pneumonia.

The second man clearly had pneumonia by x-ray and clearly had some complications from the pneumonia. And the last I heard, the feeling was that it was a different organism and not anthrax.

Yet, he had a positive testing for anthrax in the mucous of his nose.
That's correct.

That's what is puzzling.
That's right.

The general audience is asking a question you can understand: Could this be related to the same terrorists that were planning to crash those airplanes into the buildings in New York and Washington, D. C.? Nobody has seen a case of human inhalation anthrax in the United states since the 1970s.
That's correct. The coincidence in time and place where these things have happened is certainly something to be looked at with concern. But meanwhile, what has been done is that the building has been cordoned off so samples can be taken and they are being taken. The people who worked in the building have been started on antibiotics which is the proper course to take. Certainly, the FBI

is very active in this case as are people from the Center for Disease Control as well as the local health department people who I have been told are very good. There is more evidence coming in yet. so I don't think we can make a judgment at this point other than to say, 'Let's do everything we can to find out just how this man got infected, two of them, got infected and how those anthrax spores wound up on the keyboard."

Bioterrorism?

The FBI says so far it has not been able to link the two inhalation anthrax cases to any terrorist act. But Florida's Health Department is urging that all American Media employees who have worked in that building since August 1 report to the Palm Beach County Health Department in Del Ray Beach for testing. The health department is giving out an antibiotic that is effective in killing anthrax bacteria.

The incubation period for anthrax from first inhalation to symptoms can be from six to forty-five days. Fortunately, it is not contagious from person to person. But these two cases underscore the importance of understanding and coping with bioterrorist attacks in aerosols deliberately released from airplanes or other sprayers filled with biological weapons such as dry spoor anthrax or smallpox viruses.

I asked Dr. Henderson why some people argue that anthrax cannot be distributed easily by spray planes or other mechanical spray devices.

Dr. Henderson: "It's just not all that easy to grow up the anthrax organism and to put it in the right kind of form and then to distribute it. I think they are right. This is true.

On the other hand, let's recall that the people who flew the airplanes into the international trade center didn't make airplanes. I'm sure they didn't know how to make airplanes. They captured the airplanes. Could they go and buy anthrax spores? Well, there are a lot of countries, any number of countries, that have the ability to make anthrax in the form that it could be used.

That is back to Saddam Hussein in Iraq and Russian research prior to the change from the Soviet Union?
That is correct. We know for a fact that the Russians were turning out anthrax spores in tons and tons quantities. They even had an accident when one of the plants that was making anthrax in this form leaked from the plant. Somewhere around 100 people died as much as three miles away and it was just a minute amount of these anthrax spores that escaped.

The Iraqis had a very extensive operation producing anthrax. What we suspect is that there are a number of other countries that have this capacity to produce anthrax in this form, including such as North Korea, Iran, Syria, Libya, so that it is not just Iraq and Russia. The point that people have been making is that it would not be easy for you or I or even somebody with a fairly decent biological background to identify the right organism, to produce it, to put it in the right form, to distribute it. But that's fine. I don't think they could.

Do we know in the United States where all of that anthrax research product in Russia is today?
No, we do not. Russia had fifty different laboratories where work was going on with biological weapons. Some of those have been closed down. Some of them are ostensibly being used for domestic purposes now. There are at least four that are under the Ministry of Defense and are still super secret laboratories. No one is allowed into those laboratories except the people who work there.

Could you please explain what the distribution problems are for bioterrorists to use planes to spray large geographic areas or target something like a subway?
The trick is to put out what we call an 'aerosol.' When you dust your roses, you have a powder there. The organism that is used is about the same size as anthrax and it's a very fine powder and drifts out over the roses. There are various ways once you have it in this powder form that it can be distributed. And what as know - we talk about the crop dusters and people say, 'Well, it's very large particles and they don't normally spray with fine particles because it drifts away.' True. But you can change the adjustments on the aerosolizers. It's not difficult to do. Change a couple of nozzles. It's quite simple.

We use aerosols for people who have asthma. they use inhalants. They inhale and that's an aerosol and the reason it works pretty well is that it's in fine particles and it goes right down into the lungs where they need it. So, there are many ways to put out these fine spray and the technology is not that complicated.

If terrorists got a spray plane with the right dry, powdery anthrax spores and distributed them over New York City, what is the worst case that could happen?
There are several problems that have to be solved and you can't answer that question easily. First of all, you've got a wind. And if the wind is very still, it's not going to go anywhere. If the wind is too strong, it's going to blow it away. It's not going to settle the way you'd like it to settle. If it's done with a bright sunshine, the sunshine itself may kill off the organisms.

So ultraviolet light can kill an aerosol of anthrax?
Yes.

Could it kill an aerosol of small pox?
Yes, it could.

Daytime distribution might not work, but night time would?
Exactly.

Smallpox rash that became infected and left pock scars.
Photograph courtesy Center for Disease Control.

Small Pox

Since we have a generation that has not been vaccinated against small pox and it's already been demonstrated that Osama bin Laden and the Taliban advocate dying for their cause, all the terrorist cells would have to do is infect some of their people with small pox here in this country and have them walk around. Since it's highly contagious, that could spread the disease throughout much of the unvaccinated population, couldn't it?
Well, I think we need to put the small pox into perspective. I spent eleven years in the small pox eradication program, so I know small pox pretty well. Small pox mainly spreads from an individual to people who are in close contact with them; that is, within about 6 feet. And only after they get a rash. So, as we saw in country after country when we had outbreaks of small pox, the individual would get this high fever at the beginning of this and it would go on for two or three days and he would feel so miserable, he would usually go to bed. And then the rash would begin and at that point, he could begin to transmit infection. I think this is different from some other diseases we know. In measles, for example, an individual who comes down with measles, gets sick with measles, may transmit the disease like one or two days before they have any symptoms at all. And often when they are walking around. but with small pox, you don't see that.

The patient gets very sick and usually takes his bed, so he is usually infecting only household members or friends or family who come to visit him.

Ring Vaccinations

That's why the public health focus on ring vaccinations?
That's exactly right. Let us say you have a patient who is sick and has the rash. What you want to do is find out who has been in contact with him. And then you would immediately want to vaccinate those individuals and their household contacts.

Small pox vaccine is quite unique in a way that many people don't realize. Small pox vaccine will protect even if it is given two or three days after you have been exposed. You may be exposed to an individual, may have even inhaled the virus, but if you are vaccinated within two to three days after that, you are still protected. With most vaccines, you have to be protected well before hand. But this is different. And even when it is given four to five days later, it has a major influence in avoiding a fatal outcome.

We could use ring vaccinations to help isolate an outbreak whether it was terrorist-induced or some other contagion?
Exactly. But what you do, you vaccinate the person who has been in contact with the patient. You may be too late to have gotten to him (patient), but if you have his whole family vaccinated, then there is nobody for the disease to spread to and it dies out.

If it were this simple, why would we have any concern about small pox or anthrax as a bioterrorist weapon?
Well, let's take them one at a time because anthrax is not spread at all from

person to person. Small pox does, but anthrax does not.

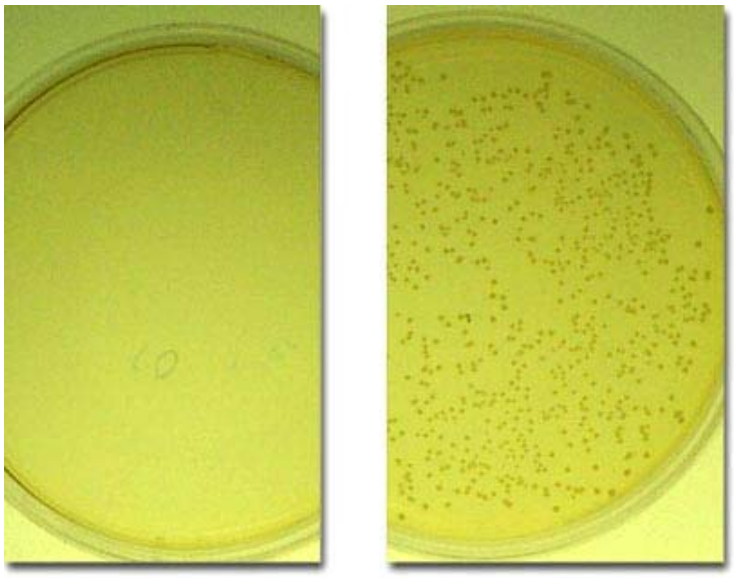
Now, this is where for most of the cases of small pox the individual who is ill is going to infect a comparatively small number of people. but there are some where we are going to have a bigger problem. And there is a very small percentage of cases of small pox that have a very severe form of the disease and they spread it not by droplets from person to person, but goes up in a very fine spray or mist into the air. Then it can spread over quite a distance. One outbreak we had in the 1970s in Germany we had a patient who was isolated in a room on the ground floor of a hospital and we had patients on the 2nd and 3rd floors of the hospital that were infected, even though he never left that room.

There are a few cases that are extremely dangerous who can spread the disease more than others and that can give you some difficulties in trying to control it. But the fact that the small pox is not going to spread like an uncontrolled wildfire or like influenza it's not going to go that fast. this is why we put a very high premium on early detection and in getting vaccine out very quickly and there is vaccine available on an emergency basis. This could be out in hours to the place where it is needed.

Has the bush Administration and Congress authorized an increase in the supply of small pox vaccinations?
Yes, they have, and that vaccine is going to be delivered. It will be awhile, it will be some time next year before the first of those lots come off, but there are other steps being taken to expand our vaccine supply."

"Nano Bombs"

The Bush Administration has authorized production of more smallpox vaccines which will increase U. S. supply in 2002. In addition to vaccines, there is another discovery waiting in the wings which could neutralize the bioterrorism threat by literally blowing up the germs, called "nano bombs." The decontaminant is made up of microscopic droplets of oil layered with detergent and suspended in a watery solution. The oil drops are called "nano bombs" because they are smaller than anthrax bacteria or smallpox viruses. When those tiny oil droplets come in contact with germs, they fuse to the surface of bacteria and viruses. That causes the membrane surrounding the microbes to burst.



Dish on right contains bacteria. Left dish shows what happened to bacteria after treatment with nanoemulsion decontaminant developed by Dr. James Baker and NanoBio Corp. Photograph courtesy University of Michigan Center for Biologic Nanotechnology.

I first reported in 1999 and 2000 about this breakthrough with its inventor, Dr. James Baker, at the University of Michigan. The last time I interviewed him, he was getting ready to test his nano bomb solution for the U. S. Army. He also took his invention through the patent process and now has a company called NanoBio Corporation affiliated with the university to produce and distribute what could be a wonderful, non-toxic answer to bioterrorism. This week I talked with the Chief Executive Officer of NanoBio, Ted Annis.

Ted Annis, Chief Executive Officer, NanoBio Corporation, Ann Arbor, Michigan: "Dr. Baker's material took top honors and it was the only material, by the way, that was not toxic and not caustic or corrosive. You can actually drink this material. You can put it on your skin and you're OK.

What was the Army's reaction to the fact that this oily water substance could be so effective and non-toxic at the same time?
They were very pleased and happy with this result. The part of the Dept. of Defense known as DARPA which funded this research was extremely pleased. This was a DARPA success. They funded this research effort at the Univ. of Michigan. Dr. Baker discovered or invented this material and it's regarded as quite a success. This material can be loosely described as a salad dressing that kills anthrax. And people are skeptical when they hear that, including people in the military, despite the military's own data.

You would think that everybody would be enthusiastically embracing this now since Dr. Baker's last tests showed the oily substance could be sprayed on children, animals, plants and adults without harm, yet 'blow up' viruses and bacteria.
Exactly. We are seeing some signs of interest from the Dept. of Defense and from our government. We hope they embrace this enthusiastically. They haven't yet. Quite frankly, I'm expecting that to happen and I'm waiting for them to call and have us go to Washington and sit down and talk about how we get this out into the field and out into the population within 6 months.

If the Army already knows it works in tests, why wouldn't your nano bomb solution be front and center for distribution in the U. S. right now in the

face of bioterrorism?
Very interesting question. I don't know. It isn't for lack of our talking to different people in the Dept. of Defense. The only thing I can tell you at this point is that the only time table I had seen prior to Terrible Tuesday from the Army was a time table that would put this material, or some bio defense material, in the hands of the soldiers by 2006. Now, of course, after Terrible Tuesday this is clearly going to be accelerated.

How do you accelerate the process if people are still not calling you to Washington, D. C.?
That's a very good question. I only hope that we are called, that we go to Washington, that they listen to our requests for some emergency funding so we can finish testing this material and get it through FDA and EPA registration and then this can be available almost immediately.

NanoBio Corporation is based on a patent that Dr. Baker filed after his discovery?
A little more complex than that. The NanoBio Corp. is a Univ. of Michigan spin-off and it was created to commercialize this technology because there are great applications from this technology from dealing with HIV to herpes to sanitizing surfaces to sanitizing skin, all of which would be either a product or end products you would normally buy from the store. And prior to Terrible Tuesday, that was our mission: contacting the large consumer products and pharmaceutical companies in the world to let them know about this and socializing the science with them. And that's what we were doing prior to Terrible Tuesday.

What is Dr. Baker's perspective on this product now in terms of immediate application in the event next week there was a bioterrorist attack with anthrax or small pox in an aerosol?
Heaven forbid! but if there is an anthrax attack at this moment or within the next couple of weeks, there isn't a darn thing we can do because we cannot get this material approved, manufactured and distributed that quickly.

You wouldn't personally have any problems being sprayed with the nano bomb solution?
No, as a matter of fact, I sent everybody in the company home with an assignment two nights ago. We have mocked up military decontamination kits, so we made military decontamination kits which basically consist of a small, flat package with a sponge in it impregnated with this material. And everyone's assignment was to make sure it covered their entire body. There was enough material in the package to cover the entire body, so we all went and did that. So, we all washed down with a nano emulsion and there was enough to put it in our hair when we were done. So, that's a wonderful example of how safe and comfortable we are with it.

Everybody in your company has washed down with this oily nano bomb substance and everyone is fine?
Yes, there wasn't a germ alive on my body when I got done.

Because literally, these oily emulsions blow up viruses and bacteria on contact?
Yes, it is interesting how they work. They don't work like typical antibiotics or complex molecules. What they are essentially are these very small oil droplets

that fuse with the virus and bacteria. They fuse with them and by virtue of fusing with them, they essentially blow open their membranes and that kills them. And it's a very fast and effective process.

Couldn't this also be applied to normal internal medicine in some other way on flu bugs and other microbes?
Interestingly enough, a follow on product that we've also been talking to the government about is in fact a nasal spray that would act like a passive vaccine that you would put this in your nose and these nano droplets would remain in what's called a mucosa for a period of time. And when you inhale a bad bug, it kills the bug on the way into your system. This particular use of the technology has shown great promise in a laboratory using mice and influenza."

More Information:

There are three categories of anthrax disease and none is infectious person-to-person:

1) **Cutaneous anthrax** - bacteria or its spores (hibernating bacteria protected by hardened sheaths) naturally found in soil or on animals such as sheep get into cuts or scratches in skin and over two to six days spread into a pimple that becomes a blister that becomes a large, depressed black scab. The word anthrax is Greek for "coal" because of its blackness. With antibiotic treatment, cutaneous anthrax can be cured. Without treatment, the mortality rate can be 20%.

2) **Ingestion/gastrointestinal anthrax** - bacteria form on spoiled, undercooked meat which when eaten make people extremely ill and can cause death. Symptoms include nausea, abdominal pain, vomiting, low energy and bloody diarrhea. Antibiotics can help if treatment is early in the disease. But mortality rates are high because early diagnosis is difficult. To date, no cases of gastrointestinal anthrax have been reported in the U. S.

3) **Inhalation anthrax** - dry anthrax spores can be breathed deep into the lungs. If enough - approximately 8,000 to 10,000 spores - are inhaled, the spores germinate into anthracis bacteria. First symptoms are like a flu with fever, dry cough and chest pain anywhere from six to 45 days after exposure. The maturing bacteria produce lethal toxins that spread into the bloodstream and cause systemic shock and collapse of body systems resulting in death. Inhalation anthrax death rate exceeds 90%.

More Facts about Anthrax from the Center for Disease Control:

> "Anthrax is an acute infectious disease caused by the spore-forming bacterium Bacillus anthracis. Anthrax most commonly occurs in hoofed mammals and can also infect humans.
>
> Symptoms of disease vary depending on how the disease was contracted, but usually occur within 7 days after exposure. The

serious forms of human anthrax are inhalation anthrax, cutaneous anthrax, and intestinal anthrax.

Initial symptoms of inhalation anthrax infection may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax is often fatal.

The intestinal disease form of anthrax may follow the consumption of contaminated food and is characterized by an acute inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting, and fever are followed by abdominal pain, vomiting of blood, and severe diarrhea.

Direct person-to-person spread of anthrax is extremely unlikely, if it occurs at all. Therefore, there is no need to immunize or treat contacts of persons ill with anthrax, such as household contacts, friends, or coworkers, unless they also were also exposed to the same source of infection.

In persons exposed to anthrax, infection can be prevented with antibiotic treatment.

Early antibiotic treatment of anthrax is essential - delay lessens chances for survival. Anthrax usually is susceptible to penicillin, doxycycline, and fluoroquinolones.

An anthrax vaccine also can prevent infection. Vaccination against anthrax is not recommended for the general public to prevent disease and is not available."

Websites:

http://www.nanobio.com/

http://nano.med.umich.edu/

http://www.bt.cdc.gov/Agent/Anthrax/Anthrax.asp

Credits