

## **13. Update on Bioterrorism Preparedness**

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Dr. Blanck has been introduced in a number of ways and has been a lot of things in his distinguished military and medical career. He now works at one of the premier medical institutions in the state of Texas, where he is the president of the Health Science Center.

DR. BLANCK: Well, good morning, everyone. It's a pleasure to be here. Indeed, I am president of the University of North Texas Health Science Center, one of the newest health science centers in the state of Texas, with the Texas College of Osteopathic Medicine and a physician's assistant school within a graduate school of biomedical science.

And one of the things that I'm proudest of is the brand new public health school. We have the third school of public health in the state, fully accredited as of this past February, and heavily involved in a lot of the things that you heard the previous speaker describe.

We just received Robert Wood Johnson Foundation funding, as well as some private foundation funding, for a Texas Center for Hispanic Health, that's looking particularly at children as we try to provide health information to that community. We're also building a new biotechnology building, which will have part of the school of public health in it. There's going to be a center of genomics and proteomics, noninvasive imaging, and DNA. And there will be a public health emphasis.

We're all faced with the problems and issues that I'm going to talk about. Weapons of mass destruction, not just bioterrorism, because we really need to put bioterrorism and biologic weapons in the context of mass destruction. They are one of a number of things that affect us and obviously have potential impact on children, and children need to know about these kinds of things. The scariest are nuclear, chemical, biological, and conventional explosives. (Figure 13-1) These were all originally designed by or used by armies against armies. That's what they were for. But now terrorists have taken it to the next step. Terrorists deliberately target civilians with these weapons, using technologies of airplanes or the mail, to deliver these weapons to civilians. (Figure 13-2) What are they trying to do? They're trying to disrupt us. They're trying to create panic. They're trying to get us to change what we do, the way we live, the way we behave, our leaders, and our policies—support of Israel, for example, or removing our forces from Saudi Arabia. These are the goals of terrorists.

Now, this definition suggests that civilians are targeted with weapons that could cause a lot of casualties, weapons of mass destruction. But the terrorists do not necessarily really want to cause a lot of casualties. What they really want to do is create the fear that will bring about their desired outcome. So Tom Clancy, in his book *The Sum of All Fears* said it best—kill one, frighten 10,000.

How many have died from anthrax? Five, but 282 million of us are pretty darn scared, and in fact, that's been a worldwide kind of frightening episode. My main office when I was surgeon general of the Army was in Falls Church, Virginia, but I also had a Pentagon office and my staff moved out for renovation three weeks before the plane went in. In fact, about three-quarters of the people who were in that wedge, about 800, had moved elsewhere. Two hundred were left, and 131 were killed, including a number of friends and folks whom I knew and worked with.

Well, we've known about these kinds of weapons. We've known since the 1990 Gulf War. We knew since the bombing of the World Trade Center in 1993. And there were weapons such as biologic agents. Saddam Hussein had anthrax or has anthrax. He certainly had it then, and botulism toxin. Other countries we knew had it, and we knew the terrorists would use things like explosives for the World Trade Center. So President Clinton put out a presidential directive, and a lot of things happened in the early '90s, trying to get at these kinds of things.

The Federal Bureau of Investigation and the Federal Emergency Management Agency were charged either with crisis management or with consequence management, crisis being measures to anticipate, prevent, or resolve a threat, the law enforcement issue, and consequence management was measures to prepare to take care of a lot of casualties, basically. That's mostly what the consequences were, transportation issues and all those kinds of things.

Now, subsequent to 9/11, Governor Ridge has been placed in a homeland security role, and they're still debating whether that's going to be full cabinet-level agency and all those kinds of things.

This is a little bit late, in my view, to have that decision, but heaven forbid we should do things rapidly. I used to point out that the 41 distinct federal agencies with various roles in combating or dealing with weapons of mass destruction are poorly coordinated.

That was before 9/11. Now, post 9/11, the 41 agencies doing various things for dealing with weapons of mass destruction are still poorly coordinated.

We haven't come a long way in coordinating things any better, but we have done a lot really to prepare. Thanks to Nunn-Lugar-Domenici legislation that supported that presidential decision, we've actually started training in 120 cities in this nation, including San Antonio, Houston, Dallas and Fort Worth. Training to get first responders—police, fire, emergency medical technicians—up to speed, and give them equipment, plans, communication. And they've completed the second iteration. So much has been done in dealing with that. We actually saw the results of this with a far better response to 9/11 by police and firefighters in New York City than with the 1993 bombing.

Unfortunately, they were so good that a lot were caught in the collapse of that building and tragically killed. Nonetheless, the response was very good. But notice what response it was. It was the traditional first responders—firefighters, police officers, and emergency medical technicians. Little attention has been paid to the biologic weapon first responders, and do you know who that is? It isn't the police and isn't the fire department; it could be EMS. It's us. It's health care professionals. It's people in public health. It's people in physicians' office, veterinarians, anybody with health training who might see something unusual. People like this will be the first responder to diagnose and record biological terrorism. And then the response will be one from public health, quite different than dealing with casualties from an explosion or something like that.

A lot more needs to be done there. The emphasis has properly been placed on local response, within regional, state, and finally, federal response. (Figure 13-3) The feds have a key role in putting out policies, starting up the smallpox vaccination program, stockpiling antibiotics and all of that, but planning and responding for all of these issues must be local. That's where it has to start, so I hope that all of you in some way or another are aware of or perhaps even involved in planning at your own institution, your own organization, because we're all part of this, let me assure you. We are all a part of this.

Now let's talk about biologics specifically and where this all fits in. The definition is simple—the intentional use of organisms or toxins against humans, animals or plants. Remember the definition of terrorism? Disrupt and create panic.

If you really want to disrupt us in Texas, you don't have to go against people. What if you use foot-and-mouth disease. That'll do it. There are all sorts of examples we can use, and actually USDA and EPA have some very nice surveillance systems in place. Sounds like public health. Yes. It's exactly the same principle, and that's what they're doing to combat this threat. You know about anthrax. I'll not belabor that.

I do want to tell you that this is by no means the first time, only that we are now newly aware of this threat. It's been around for a long time. (Figure 13-4) In the fourteenth century, the city of Kaffa was besieged by the Mongols coming west. Well, with the Mongol came the plague, and the fleas and the organisms and all that kind of thing. They took their plague-infected corpses and catapulted them into the city of Kaffa, and created an epidemic of plague in Kaffa. The city fell. The survivors went through Europe, and that's probably how the Black Death began in Europe, the plague that ravaged the continent. It killed millions and millions of people, one-third of the population in the 1300s.

Of course, in our own country, in Massachusetts, we gave Native Americans smallpox-infected blankets. We gave them blankets on which smallpox patients had oozed and coughed and so forth, created an epidemic and wiped them out. The signature on the order doing that, popular in his day I suppose, was General Amherst. And of course, the city of Amherst is named after him, as is the college. I suspect this is not something you will find in the college brochure nor in the history of the town. But that's what they did.

We had a defensive program in 1953. We actually had an offensive program in 1943 with the British, because we knew that the Japanese and Germans were experimenting with biologic weapons. And then in 1969, we disestablished our program. Actually, President Nixon, in a particularly courageous decision in my view, unilaterally renounced the use of biologic weapons. We did away with all of our weapons, and based on that, an old 1925 protocol, was resurrected.

Another convention was held in '72, and in '75 that was signed by all the nations of the world. And what Nixon said, and it was reiterated, by Congress, was we would never use biologic weapons under any circumstances; we would destroy all of our stocks, and we did so.

By the time I was surgeon general, the Soviet Union had fallen but the Russians still came and inspected Dugway Proving Ground and Fort Dietrich and all the places where we might have been making or storing biologics. And we sent and continue to send inspection teams there to see what they're doing. We get into most of the cities that in the Soviet Union days we weren't allowed into, secret cities. We still have some difficulties getting into a few places in Russia, but mostly, we can go in and inspect, and they have destroyed at least most of their stocks.

In Figure 13-5 you can see the things that we were working on, not just against people but also against crops. Actually, the Germans used biologic warfare in World War I. Everybody knows they used chemicals in World War I. How many knew that they were using biologics?

Well, they were. They infected animals, with glanders and anthrax, and sent them into the ranks of the British and French, trying to disrupt their supply system. Not particularly successful, but that was an attempt at biological warfare.

We did some work on incapacitating agents, agents that make people sick. They can't fight, and we can just go in and take over. There's been work done in incapacitating chemical agents as well. We saw some of the difficulties with the use of these agents recently by the Russians in Moscow, where the interior ministry forces used such an agent in the hostage situation with Chechens holding Russian hostages, and 100 hostages were killed, not by the terrorists but by the incapacitating agent. They used probably a morphine derivative, an opiate. The big problem with all those kinds of things is dosage. You have no clue. People vary in their tolerance, and what would put one person to sleep might kill someone else or at least leave someone else conscious. So we've never gone very far with these agents in our own programs. Obviously, the Russians felt the risk was worth it, and 750, I think, survived, so arguably they were right.

Now, we were pretty comfortable after that Geneva convention that people really were trying to get out of the biologic warfare business, even the Soviet Union. Trust and hope both spring eternal, until we heard about Sverdlovsk, a city in the Ural mountains. (Figure 13-6) In 1979 we heard that there was an anthrax epidemic in that area. Gee, why is that? The Soviets said it was contaminated food, not a big problem. Well, it was a big problem.

We determined that they were producing somewhere around six tons of anthrax per year. Six tons. The anthrax that was sent through the mail was about four or five grams. In 1979 what happened was a filter was mistakenly left out of a vent, and a very small amount of anthrax—about the same amount, actually, that was mailed in the Florida incident—was released into the atmosphere. This wasn't from a low-flying airplane or a tall building. It just puffed up into the air and disseminated about ten kilometers. If it was weapons-grade (finely milled, with little or no electrostatic charge) it really floats, and the furthest extent of human deaths from that little bit of anthrax was ten kilometers. The furthest animal deaths were 50 kilometers. Think if somebody were to release a pound or ten pounds or 100 pounds of this kind of anthrax. Imagine the extent of coverage and potential casualties that we'd face.

Well, not being totally stupid, we said "Hmmm, they're still making this stuff." And indeed, we subsequently had confirmation by Ken Alibek, who was their deputy director of biowarfare and who was a consultant of mine when I was surgeon general. He obviously has come over to our side and now has his own laboratory and consulting company, in western Virginia. So from the former Soviet biowarfare director to a beltway bandit. I think that only in America could that kind of thing happen.

Anyway, here are the agents they were working on, producing tons of these kinds of things, including smallpox. (Figure 13-7) We believe that they probably still have some small supplies. At least, the Soviet military holds them. As far as any further work being done, probably not. Seems that their once-secret cities are pretty much open, and we're reasonably sure that they've stopped most of their work. There are some small areas of research going on. The Russians said "Oh, you knew we had programs, but you weren't even close to knowing what we were doing. We had more institutes working on plague than you have scientists. Plague is an endemic disease in our country, as you well know."

Why would terrorists use biologic weapons? Because they're relatively easy to get, fairly inexpensive, and can be disseminated. (Figure 13-8) They're invisible; detection is difficult. We have few real time detection systems, and, of course, the first sign would probably be illness, as we saw in Florida. The physician who picked up that case of anthrax in the reporter was a hero. He picked it up and reported it to public health. Public health did their epidemiologic studies, determined the source, recognized who else was exposed, and provided prophylactic antibiotics and, according to a Hopkins study, prevented somewhere between nine and 50 additional cases of ventilation anthrax. Marvelous. What a thing that was, and so he certainly deserves a lot of credit.

Where did the perpetrator get the organisms? Well, they're all over the place. People do research on them. You have to have them to make vaccines. Of course, for smallpox, you don't use the smallpox organism for the vaccine; you use vaccinia virus. But for virtually everything else, you use the organism that could, if produced in sufficient quantities, be used as a biological weapon.

Or go to West Texas, dig up the soil on a ranch, put it on sheep's blood agar, and you will grow anthrax probably seven out of ten times. It's there. It's all over the place. So people can get these and have access to them.

Now, you do have to put anthrax through a certain process so that it can disseminate as easily as it did in the mailings. But anthrax is anthrax. It's highly lethal and certainly could be used as a weapon.

Smallpox, of course, you don't have to prepare specially. All you have to do is infect some one. Smallpox is infectious; it is highly communicable. Walk through an airport and infect 20 people who get on 20 airplanes, go 20 places, and you have created some significant problems.

How is this going to be spread? This is a hypothetical dissemination of various agents with a fair amount of agent, 50 kilograms. (Figure 13-9) Note thousands killed. But I don't think this is the most likely dissemination of biologics. It probably is going to be through letters or packages, airborne, as we saw from the Sverdlovsk incident or with the Florida mailings—that was airborne anthrax.

Person-to-person transmission is possible. Pneumonic plague is communicable. Smallpox is communicable. Dissemination of toxin would be through airborne distribution or food contamination, again let me emphasize, the responders are not police officers, firefighters, emergency medical folks. They're us. They are people who are in clinics or work in public health. I gave a talk in Fort Worth to all the school nurses in the independent school district of Fort Worth, because they could see something that might be an indicator of something happening. So it's anyone who is involved with patients who has to know the symptoms and so forth. But how do we detect these infections or toxins besides looking at symptoms or the rash of smallpox.

During the Gulf War, we had some great biologic detectors. Unfortunately, it took about 24 hours to detect, and that's not good enough. We now do have rapid-cycle polymerase-chain-reaction detectors, and we can use more and more polyclonal antibodies that will detect in about 40 minutes. So we're getting closer to real time.

If any of us sees a case of smallpox, or if somebody runs in and says, I think I have a case of smallpox we ask experts to come and look. Does this look like smallpox? That's about the best we can do. Of course, you take specimens, samples, swabs. And Texas now has in Austin at the State Health Department, electron-microscopy capability to reliably diagnose smallpox in about 12 hours.

A silver lining in all of this is renewed emphasis and focus on public health. It's the basis of health in this country, but we don't do health care in this country, except for public health, which is underfunded. We do disease care, and we don't combine these two very well, do we?

So this is a way to focus on public health—stockpiling antibiotics and vaccines. Of course, there's a problem with vaccine production. I think it's a national disgrace that we don't do it very well in this country because there's not enough profit in it. There's only one place that makes anthrax vaccine. There are now three places making smallpox vaccine under contract. How many of us have had huge problems getting childhood vaccines—DPT and influenza and all the rest of it, because we don't have great production capacity. And we should, for heaven's sake. If any country in this world ought to have that capacity, we should, and we don't.

Children's issues, specifically. Well, virtually none of the new drugs are FDA-approved for kids. So if you want to put a child on antibiotic prophylaxis with CIPRO or tetracycline, it's almost always under an investigational status. People are working on policies that in case of a national emergency these agents could be cleared by the governor or somebody. The restriction would be waived and we would be able to include children. Right now, there's virtually nothing that's out there that would be good for these organisms. Some anthrax is susceptible to ampicillin and that kind of stuff, but most of it is not.

Anthrax is the only vaccine against biowarfare agents currently FDA-approved. Even the new smallpox vaccine is not yet FDA approved, because we haven't made it for so long we have to go through the whole I&D process again. We're going to do the Phase 2 trials on smallpox up in my health science center. So we really don't have vaccines for these agents for kids. None of it. Anthrax is not approved for anybody under 18. Smallpox, still I&D, and all the rest of the vaccines, mostly what the military has developed, are I&D, and therefore that would be at issue for children. Even devices such as the automatic valium injector and things like that—nobody's done any work with children because the work has been in the military for soldiers, sailors, airmen, RNs, and Army GIs. And so an awful lot of thought needs to go into this and policies need to be put in place.

One of the things that many of us found out post-9/11 is that when you were counting on your staff, either as first responders or public health or anything else, guess what happened? They're parents. They all went and picked up their kids. And of course, the schools didn't know what to do. How are we going to deal with that? In Fort Worth, we made the decision and communicated it in throughout all of Tarrant County, which I'm in, that the kids will stay in school. If there is some kind of emergency, kids will stay in school and the school administration will be prepared to take care of them for at least a short period of time, until a decision can be reached as to what to do next.

Risk communication. Well, risk communication is not just post-event. I think the best example of good risk communication was Rudy Giuliani in New York City. Terrific job. Single spokesperson, credible, all that kind of thing. Worst example was the various folks who talked about anthrax after those mailings from the federal government. Now, some of them were very good, but most didn't know what they were talking about, used incomplete information, or gave conflicting messages to the public. The federal government needs to do that better. We all need to do it better.

However, it isn't just immediately before or post-event that we need to be active. It has to be well before too. How are we educating our children now about the world in which they live in a way that is informative but not enormously frightening, so that when they hear about something that has happened, they can say "Oh, yes, I know a little bit about that." How do we do that? I think this is something that we need to work on.

So for anybody involved in health in any way, it seems to me we need to have an awareness of what it is going on. What are the signs and symptoms of anthrax, of smallpox? How do you report it and to whom? We put it on our website. Here in Texas, there are actually two toll-free numbers that will get you into your public health system, no matter where you are. You can use the same number in the Border region as in Denton County. It will either go to a local public health department or if there isn't one, it will go to the regional or to the state level. Contact the Texas Department of Health at 1-888-963-7111. Report any suspected outbreaks or unusual expressions of illness to 1-800-705-8868.

You need to know a little bit about public health response. There are physician protocols and patient information on a web site—[www.texmed.org](http://www.texmed.org). (Figure 13-10) This is from the Texas Medical Association Task Force on Bioterrorism, which I chair. It's not just for health care folks. It's also for patients. There's patient information there that could be used in dealing with children.

Why is all this important? Because it's not a question of if, as we've said before, or even a question of when, but when next?

Thank you very, very much.