

# Anthrax Remembered

*[Announcer] This program is presented by the Centers for Disease Control and Prevention.*

[Peter Drotman] Hi! I'm Dr. Peter Drotman, Editor-in-Chief of the Emerging Infectious Diseases Journal, and I am talking today with Dr. John Jernigan, a career medical officer here at the CDC, and as part of the EID Journal's 20-year anniversary here in 2015, we are discussing historic events that put this journal on the map, so to speak. And one of those events occurred in the watershed public health year of 2001, when in the wake of the 9/11 attacks, anthrax outbreaks were detected in several places. Dr. Jernigan was recruited to investigate some or all of those attacks. Tell us how you came to be identified as the CDC point person.

[John Jernigan] Well, I think that my role was sort of the lead investigation for the *clinical* aspects of bioterrorism-related inhalational anthrax. I was new to CDC, as well. I had been here in Atlanta on the faculty at Emory University School of Medicine in the Division of Infectious Diseases, so was still quite active clinically in infectious diseases and had just come to CDC working more on the public health aspect of my area of interest, which was healthcare associated infections, but when - and I'll never forget it, it was actually the Columbus Day holiday in October of 2001, and I had known that there was a case of inhalational anthrax that had been identified in Florida and there were some investigations going on; it was very unclear of what the circumstances were. You know, at that time, it was a very unusual diagnosis. The last case of inhalational anthrax in the United States had been 25 years earlier, very rare disease, and so it wasn't clear at all at first that this was related to with anything having to do with bioterrorism, but anyway, I was aware that there was this investigation in Florida. And I got a call from Julie Gerberding, actually, on the Columbus Day holiday, and she called me up knowing that I was still very active clinically in infectious diseases and said, "Can you be in Florida in two hours?". And I said, "What are you talking about?" She said, "Well, this anthrax thing is heating up." They had identified a second case by that time. We were beginning to get a sense that this was not related to animal exposure, which is the usual sort of course--that this was something very different. And so, I found myself on a plane a couple of hours later, and my specific role was to investigate the clinical aspects of bioterrorism-related inhalational anthrax. As I said, it was a very rare disease; we hadn't had a case of it in 25 years and there were a lot of questions about, you know, the clinical aspects. Would this behave differently from, sort of, natural inhalational anthrax infections? What's the best way to treat it? The fatality rates for cases up to that time had been very, very high, and the question was, "Can we do anything different about that?". So, that's how I got involved.

[Peter Drotman] So the initial case that was diagnosed in Florida was accomplished by a very savvy, and alert, and suspicious, emergency room clinician, as I recall. How did he come to have those suspicions, how did he recognize anthrax, and what did he do to alert public health officials?

[John Jernigan] Well, it was a very astute clinician who recognized this very unusual circumstance and he deserves a lot of credit for, sort of, for raising the alarm. You know anthrax is--

[Peter Drotman] So, how did that patient first present to the emergency room?

[John Jernigan] Right, well the patient actually had been traveling, but presented with signs and symptoms of meningitis. So fever, headache, stiff neck, etc. And um...

[Peter Drotman] Not respiratory disease.

[John Jernigan] Not respiratory disease, which is a little bit of an unusual manifestation. Anthrax is typically associated with, you know, the sporadic cases that we see are--are, sort of, with animal exposure, and there are three basic forms: you can inhale it and get inhalational anthrax which causes essentially a bad pulmonary disease and rapid progression.

[Peter Drotman] With coughing up of blood, as I recall, being a prominent thing.

[John Jernigan] Well, there are hemorrhagic components to it.

[Peter Drotman] But, but this patient did not have that.

[John Jernigan] Did not have that. And the other two manifestations are gastrointestinal disease or skin disease. Meningitis has been described, but usually it has been described as sort of a late manifestation of the more classic inhalational forms, so it was unusual. And again, as I said, there was an investigation of the patient's specimens in the laboratory, where they actually do a special stain of this specimen and so that you can see the--

[Peter Drotman] --it's a spinal tap...

[John Jernigan] Spinal fluid. Exactly

[Peter Drotman] With the examination of the fluid that--

[John Jernigan] Right.

[Peter Drotman] --drew off from the central nervous system.

[John Drotman] Exactly. And so they noticed this very unusual looking germ in the specimen and the clinician thought, "Gee, this could be anthrax," and alerted the public health authorities and the investigation kicked off from there. So, it was actually an impressive catch, I think.

[Peter Drotman] To remind our listeners, Dr. Julie Gerberding, who contacted you, later became the director of CDC in part because of her role in organizing the response to this outbreak. Also, to put it in context, what would you say was the mood of the nation and of clinical practitioners in response to the occurrence of these very serious cases?

[John Jernigan] Well, it was interesting, of course, this occurred right in the wake of the attacks of 9/11/2001, so we, as a nation, were still, sort of, reeling, you know, from that. But it wasn't all clear at the beginning that this was related or as I said, you know, an unnatural occurrence at all, and as the investigation went on and as events played out, it became obviously very clear that

this was an intentional exposure. The attacks in Florida, it was just, you know, it was a letter that was received at a media outlet and, again, it wasn't very directly related to anything that had just happened, but we were beginning to wonder, and then when this--the letters that were mailed to the senators that clearly, sort of, had the message that this is--they tried to indicate that this was somehow related to the recent events, even though, in retrospect, that may not have been, but it was very concerning, and at one point, we were thinking, you know, where will this end? I remember one specific event when we were in Florida still, and at that point we'd only had the two known cases, both that had worked with this media outlet in Florida. It was pretty clear that they had been exposed through a contaminated envelope, probably intentionally contaminated, but we didn't know whether it went any further than that, you know one-off event, and I never will forget being in the main, sort of, center--the room where we were--the headquarters where the investigation was. And I remember that Dr. Brad Perkins, who was helping lead the field investigation in Florida, I remember seeing him taking a phone call on his cell phone and having a sort of funny look on his face, a little bit stunned looking, and obviously, he had gotten some news that was very concerning to him, and I went to him and said, "Brad, you know, what's going on?" and he said, "They've just identified a case of cutaneous anthrax in New York, the secretary of Tom Brokaw." And that just sort of hit us, I mean, completely out of left field and all of the sudden, refocused the context of this thing and said, "Wow! This thing is a lot bigger than we might have thought! You know, what sort of coordinated attack is going on here? How big is it going to get?" It was really quite concerning, and I think, generated a lot of concern, obviously, in the American public at that time.

[Peter Drotman] Yeah, so there was immense demand for information, both on the criminal investigation side, as well on the clinical and scientific side.

[John Jernigan] That's right.

[Peter Drotman] So, you began to address the clinical information needs of folks who might be seeing inhalational or other forms of anthrax. Was a seed planted that we need to start writing this up and getting peer reviewed information out there?

[John Jernigan] Absolutely, so, with the uncertainty about how big this would go, we thought it was very important to get information out there for clinicians to be able to recognize and reacquaint themselves with, you know, the syndrome of inhalational anthrax, since not many practicing physicians had ever seen a case, ever! And were unlikely to see-

[Peter Drotman] Including yourself.

[John Jernigan] Including myself, including many experts of inhalational anthrax. I'll share you a story on that in a moment. Again, as I said, we didn't know how big this was going to get, and I should point out that really, the first case was recognized by a very astute clinician, who, you know, recognized on a gram stain of a patient with meningitis that this is something very unusual this looks like it could be anthrax. And, it could be very well have been missed if the clinician hadn't thought about this and so getting the-

[Peter Drotman] I'm not even sure clinicians do gram stains anymore. (chuckle)

[John Jernigan] Well, they—that's true, there're all sorts of things, they don't. I think his laboratory director called him and said, Hey, you better look at this," but, you know, it was important to get information out there so we would understand, you know, what this disease looked like, how best to treat it, what could we do if we did recognize more cases to, you know, maximize the chance that an infected person would be recognized early, initiate treatment early, and hopefully, increase their chances of surviving, which ultimately we—think we did a better job of, at least historically, the mortality rate in this outbreak was much lower than had been previously reported.

[Peter Drotman] And as you are beginning to think along these lines, additional cases were occurring at a...

[John Jernigan] Absolutely!

[Peter Drotman] ...regular intervals.

[John Jernigan] Yeah! So, we heard about this case in New York, and that was disturbing, and then, of course, they started hearing about the cases amongst the postal workers, both in New York and New Jersey and then in the D.C. area. And, actually, my investigation in Florida was interrupted by the cluster of cases in the D.C. area, so I went directly from Florida up to help investigate the cases there, as well. Of course, there was a large cluster in New York and then, things seemed to settle down and then, sort of, out of the blue, this 92-year old woman who lived in rural Connecticut, came down with inhalational anthrax, which sort of threw us for another loop. What's that all about? And that initiated an investigation there; I spent my Thanksgiving of 2001 in rural Connecticut investigating that outbreak, and as best we can tell, that was sort of a manifestation, probably, of this women getting exposed to a very small number of spores from a contaminated envelope that had gone through the sorting machines at or near the same time that these heavily contaminated envelopes that were addressed to the Senate members.

[Peter Drotman] Now the article that was published right at about that time is entitled the first ten cases.

[John Jernigan] Correct.

[Peter Drotman] But it turned out that eleventh one could not be...

[John Jernigan] Right.

[Peter Drotman] ...included because the article...

[John Jernigan] Hadn't happened yet.

[Peter Drotman] ...article had gone through...

[John Jernigan] That's right.

[Peter Drotman]...peer review, was written ...

[John Jernigan] Right.

[Peter Drotman] ...and was in the process of being published as the eleventh case was discovered.

[John Jernigan] And we were feeling an urgency in getting that information out there, so we were working very, very hard to get that information compiled and published as soon as possible. And, in fact, initially, we weren't targeting EID. We had all planned--in fact, we had been in communication with the New England Journal of Medicine. They had already or already had plans to publish, sort of independently, a separate report on the very first case in Florida. And we were making arrangements to sort of publish our entire series and perhaps in coordination with that. You know, Jim Hughes actually who came up and said, "You know, have you thought about putting this in EID?" He says, "We've got this new journal. We can get it out very, very fast. It *is* our journal after all. What do you think about that?" And I said, "Well, great! Fine with me." You and the other staff were very accommodating and helped expedite things, and we were able to get it out very, very, very quickly.

[Peter Drotman] I would also point out that Dr. Jim Hughes was the Director of Infectious Diseases at CDC and was the director who actually hired me as the Editor-in-Chief earlier that same year. And he is one of your co-authors, so that sort of brings up another question that I often ask senior or first authors, such as yourself. How did you manage to get along with so many other distinguished scientists who are co-authors of this very highly cited paper with more than 875 citations according to the Google Scholar metrics? I know that when you're in a rush to publish and you have a large number of high-level people there are some sensitivities and issues that you need to negotiate. Tell us a little bit about that process.

[John Jernigan] Well, there are sensitivities and in any large outbreak response like this there is a cast of thousands. And everybody is playing an important role and unfortunately, you know, you can't have unlimited authors or your paper would be a long list of authors, so it was very difficult, and in this particular case, it wasn't only scientists and other epidemiologists at CDC, it was our collaborators in the field, the clinicians who were taking care of these patients, the ones who made medical records available to us, who provide us very important insight into the clinical details of the cases, so they were very important and we wanted to recognize their efforts, so, of course, they had to be included. But, there were a lot of, a lot of, discussions. You know, at the end of the day, I think we worked out a pretty equitable solution and tried to recognize as many people as we could, but that always is a bit of a challenge, especially when you're in a huge hurry like this, and when you are dealing with external partners it can be difficult, but I think everyone understood the urgency, and in the end, I think everyone was supportive with the author list that we ultimately came up with.

[Peter Drotman] I have a final question. How did this publication impact your subsequent career? You became, obviously, a pretty well-known anthraxologist in the wake of this. What happened next?

[John Jernigan] Well, it's funny, again, in the wake of some of these large responses to CDC, CDC pulls people from all over the agency. Sometimes, to be involved in ways that they don't do in their everyday practice. So, my day job is in healthcare-associated infections, not so much in anthrax, but I think because of my, again, as my clinical activity etc., I was pulled into this in a very large way. And, although, over the years, I have gone back to my major focus of interest, which is prevention of healthcare-associated infections, I've sort of moved away from anthrax. I think it did influence my involvement in some of these large responses. I've been fortunate enough to have been invited to be involved in subsequent large responses, SARS for example, to cover in 2003. I had a similar role to, sort of, lead the sort of clinical investigation of SARS; H1N1 outbreak; a large outbreak of fungal meningitis several years ago, which happened to be the largest healthcare-associated infection outbreak ever reported; and also, more recently MERS, the Middle East Respiratory Syndrome. So, I think that my experience in the anthrax outbreak equipped me well to participate in some of the larger responses, even though I haven't spent my career since that time focusing on anthrax, specifically. But I think the experience again and, sort of, coordinating novel, sort of, outbreaks that involve, you know, lots of people across CDC and external partners, I think that I've been fortunate enough to be involved in many of those, and I must say that those have been some of the most exhilarating moments in my career, to be involved in those sorts of things. I feel very fortunate to have had that experience.

[Peter Drotman] Well, thank you very much, John, for being with us today and going over the aspects of this landmark investigation and its impact on the 20 year history of the Emerging Infectious Diseases Journal. So I have been talking today with Dr. John Jernigan. If you wish to read his and his colleagues article you may do so. It is in the November-December 2001 issue of EID, as well as follow-up articles that were in the October 2002 issue. They are all posted at [CDC.gov/eid](http://CDC.gov/eid). If you'd like to comment on this podcast, send an email to [eideditor@cdc.gov](mailto:eideditor@cdc.gov). I'm Dr. Peter Drotman for Emerging Infectious Diseases.

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