# Enhancing Public Health Readiness: Laboratory Preparedness Exercise

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**Lisa Tomcko:**

Welcome to the latest edition of the College of American Pathologist CAPcast. I'm Lisa Tomcko, content specialist with the CAP. Launched in 2004, the CAP'S Laboratory Preparedness Exercise was developed as a collaborative effort involving the College of American Pathologists, the Centers for Disease Control and Prevention, and the Association of Public Health Laboratories. Laboratories participating in the LPX program are sent live organisms that either exhibit characteristics of bioterrorism agents or demonstrate epidemiologic importance. They're expected to respond following laboratory response network Sentinel laboratory guidelines if a bioterrorism agent is suspected. In this episode, Dr. Kathleen Beavis and Dr. Carol Rauch are here to discuss the history of the LPX program, and its important role in helping laboratories assess and enhance their readiness for emergencies, disasters, and other challenging situations. This episode is part of a series highlighting the CAP'S proficiency testing program, which is celebrating its 75th anniversary in 2024.

Thank you both so much for joining me to talk about this very high-stakes area proficiency testing. And would you like to introduce yourselves?

**Dr. Carol Rauch:**

Hi, I am Dr. Carol Rauch, and I'm currently an adjunct associate professor of pathology, microbiology and immunology at Vanderbilt University School of Medicine. I have been a practicing clinical microbiologist throughout my career, and I've had an interest in biodefense. I'm a former member of the CAP Microbiology Committee that oversaw the LPX survey for the period of time I was on that committee. And so, um, I'd like to open this up to Dr. Beavis to introduce herself and then explain a little bit about the history of the laboratory preparedness exercise, how and why this was created and launched.

**Dr. Kathleen Beavis:**

Thank you, Dr. Rauch. Uh, so yes, I am Kathleen Beavis. I'm a professor of pathology at the University of Chicago, and, um, I was the medical director of the microbiology laboratory at Cook County Hospital, and I'm now the, um, medical director at University of Chicago. So I was the chair of the Micro Resource Committee at the time of the survey launch. And I'm current, I currently chair the accreditation committee for the CAP. So, Dr. Rauch, thank you for your question. And Lisa, thank you to the CAP for revisiting the creation of the laboratory preparedness exercise. Uh, I was surprised, this is over 20 years ago. Um, but shortly after nine 11 Anthrax spores were sent through the mail, resulting in five deaths and several illnesses, and there was widespread panic about, but it's hard now over 20 years later to describe the level of fear that gripped the public when any kind of powder was found.

Bioterrorism detectors were installed throughout the public spaces, and any report of powder caused an alarm. And I came home one Christmas Eve to find my street blocked off by fire trucks and Chicago's finest in their hazmat suits. Small piles of white powder were found throughout Lincoln Park. The white powder turned out to be flour. Turns out a local running club was using flower to market trail. And this seems really silly right now, but these kinds of alerts were frequent and they were frightening. So anyway, shortly after nine 11 CA's Microbiology resource committee was meeting in Boston, Dr. Paul Slavic has visited with us and asked us to develop an exercise to test a laboratories ability to identify these agents. Dr. Washington Wynn and Dr. John Steele agreed to move forward with this project. We intentionally chose the name preparedness over Bioterrorism. We didn't wanna call it a bioterrorism survey.

We focused on preparedness, you know, and the reason for that is our original intention was to help laboratories prepare to diagnose patients suffering from all types of threats, including poisons, gas or otherwise, and radiation. So at this meeting, we also did a gap analysis. And, you know, at this point, hospital laboratories had been successfully identifying anthrax from these 2001 threats, but there were challenges communicating these results to public health when the results became available outside of normal business hours. So work began on several fronts. The initial surveys from 2004 sent organisms that mimicked agents responsible for bio-terrorism, but laboratories wanted to work with the real thing, and we wanted to raise the bar with the support of CAP governance and staff. By 2007, we were soon able to send attenuated strains of Anthrax Plague and other bacteria having the potential to cause terror.

**Dr. Carol Rauch:**

Wow, that's a lot. And I agree, it's hard to look back and remember the situation from more than 20 years ago. So this is a little different than your traditional PT exercise. Uh, but it does have some similarities. And I can imagine that creating this to give out some real live organisms is different and might have pose some unique challenges. Can you speak to what happened between the idea of the survey or exercise and by the time it launched, I know there must have been a lot of work behind the scenes.

**Dr. Kathleen Beavis:**

<laugh> No, there was a lot of work, but I will also say the microbiology resource committee was not new to controversy <laugh>. We sent out strains of Klebsiella pneumonia that were highly resistant when they became available. Again, you know, we're not just testing laboratories, it's part of an education. So we were not, uh, new to controversy. But anyway, for this survey, you know, the first challenge was figuring out how can we mail out the real organisms. You know, we were mailing out organisms that mimicked, you know, and in all honesty, participants were getting bored. It just wasn't challenging. And, you know, I always have the thing we can do better. And so, you know, how do we mail out though, anthrax? How do we mail out, uh, yersinia pestis that causes plague? Uh, Dr. Michael Wilson, a committee member, he led the push to use attenuated strains of the real organisms.

And attenuated strains are strains of, for example, anthrax that have a mutation, rendering them less virulent. You're not necessarily totally a virulent, but they're a lot less dangerous than the strains we would find in the wild. So this was sort of a crazy idea. It got presented numerous times, but the CAP leadership stood behind this effort. And the CAP staff was amazing at marshaling the resources and planning to mitigate any damage. So I still remember a meeting that we had in Northfield, um, at the CAP before the first shipment of the real anthrax strains launched. What could go wrong? Okay, the package with the strains could be misdelivered. And you know, we have to remember that when we were mailing these out, because of the agents we were mailing, we had to put inside the mailer what was in the mailer, what the laboratories were supposed to identify.

So we're picturing the stereotypical little old lady getting a package, opening it up and seeing that it has anthrax in it. Okay, this, this would not have been good. Uh, none of us like to be on the news. Um, another option, the micro techs in the hospital cafeteria, maybe they were over, maybe they could be overheard talking that they have anthrax and plague in their laboratory. You know, that would not be cool, and a tech could have a lab accident with one of the strains and so on. So, CAP took a lot of precautions. This survey was not mailed to just any laboratory. Um, the CAP made sure that the hospital administration knew that the laboratory would be receiving these strains. They also made the lab document that they had a biosafety cabinet two, uh, and that the work would be done in that biosafety cabinet.

But anyway, it was an absolutely crazy meeting. Um, everyone from our shipper to the FBI to a PR firm was in the room running scenarios. Karen Dorf Meyer, Mary Peyton, and other CAP staff worked to focus on the what to do when things go wrong. Wow. And so another challenge that we had was reaching agreements that a clinical laboratory could call their public health laboratory at any time, to notify them about the possibility of anthrax or other such agent, and to request their expertise. CAP, APHL, and the CDC worked to forge this collaboration that would allow reporting 24 7. This collaboration was also important because whenever there was a lab accident, and believe me in the micro committee, we always had lab accidents, typically on a Friday afternoon during a blizzard and, you know, with no other help available, but whatever, whenever we would have lab accidents, I or another committee member could reach out to the CDC and put one of their specialists in direct contact with the physician caring for the injured laboratorian. This was a great outcome of the collaboration that CAP fostered and it directly benefited the laboratorians participating in the survey. I've been doing too much talking. Dr. Rouch, can you describe some of the issues your laboratory was confronting in terms of bio-terrorism during, during the early two thousands? And I know you've been involved and interested in this topic for a long time. Tell us about your involvement in the early days of the program.

**Dr. Carol Rauch:**

Well, first I wanna thank you. You told that story, and I can feel it was a heavy lift getting those collaborations and, um, entities to be on 24 7 call. Also, I have taken safety call, um, and so I know how important it is to have backup from additional expertise. So thank you for that work. Um, and thank you to those other colleagues you listed. So looking back, um, I think my own interest was in the late 1990s, I decided to attend the initial, uh, national meetings by the Hopkins Center on Civilian Biodefense. And, um, I learned some disturbing things. One was about the stockpiles of bio weapons, um, that were significant, and another was about the previous behaviors of various bad actors who had sought to obtain and use these. Uh, so it was clear that there was some threat. And when I am concerned about something, I like to focus my energy on taking action, um, just in case.

And I had to kind of fly a little bit below the radar initially because other people had not attended those meetings or read those articles. Uh, that stimulated my concern. And so it was a little bit hard to justify writing procedures and training my bench technologists about, um, how to work such an agent, uh, et cetera. So it was, I think my biggest challenge was finding the correct zone of engagement for my administrators, my chairman, and other partners in my facility. I was in Massachusetts at the time, so whenever you start a dialogue or try to come at it sideways or whatever, I think people are quick to find someone else that could push this issue off onto. And that included, oh, sounds like an emergency. It'll go to the emergency department. Um, oh, it's, it's potentially infectious, you know, it'll go that way. And, um, trying to describe how this would impact a facility broadly, um, was really hard. I couldn't get people to put a meeting on the books to actually, um, talk about it.

And then of course, um, the anthrax incidents happened, and so we went from, you know, nobody wanting to talk about it, to everyone wanting to talk about it and needing and understanding, needing to learn about necessary communications, protection of evidence and incident command and all sorts of things. So it was a real steep, uh, learning curve for everyone. But I was grateful that I had begun all of this dialogue with my own laboratory staff.

**Dr. Kathleen Beavis:**

It's challenging sometimes when you're aware of something, and it's unfortunate when you have to have an external act that, uh, brings it to everybody's attention. You know, and I talked a little bit earlier about, you know, the lift that CAP did to bring this survey out, you know, and everything that CAP did to try to make it relevant and realistic, you know, but your, from your perspective as a laboratory director at the time receiving this survey, how did it impact your laboratory operations?

**Dr. Carol Rauch:**

I can't tell you how much I appreciate that this exists and how much I've come to admire some of the features of this particular product, uh, that the CAP offers. To be fair, there were other ways of getting some experience with live real agents. Uh, some state laboratories were offering training sessions that you could send one or two people, uh, to go to, so they would develop a comfort level and, and there were some, uh, tabletop exercises and other things. But the beauty of this is it's so perfectly fits into the laboratory workflow. It is, you know, built like a real proficiency testing survey that we've come to depend on for us to be able to show that we know what we're doing and we get feedback, uh, and we can see where there are any gaps or misunderstandings, et cetera. So building this to be just like PT with a few, um, subtle changes, I think was brilliant and I'm very grateful for it.

So the PT environment allows us to submit our results. Those get, uh, graded, a report comes back, and you can look at your own laboratory’s performance. So it was absolutely critical for all of my potential frontline bench text to, uh, get this experience. And some of those differences include the fact that they are less virulent, right? So, um, we want to be safe, but practice the real thing. And I think that was a beautiful balancing act. And the other is that unlike a regulated survey that, you know, the real official pt, the results weren't being reported to the CMS, um, where there sometimes may be, um, you know, punitive actions if you're not doing well. We wanted to bring everyone up from kind of a standing start, uh, to get to a high-level performance quickly.

I was thinking about what's an ideal frequency of having this survey? Do we want it once a month? No. Do we want it once a year? No. And so we have to kind of balance, uh, the effort and energy ta uh, we expand on testing these processes against, um, keeping things fresh enough so that people aren't hunting, uh, for procedures and they've not really tried them before because maybe they're new to the laboratory, et cetera. So I think the, um, frequency of having these a couple of times a year is a nice balance.

I'm interested in hearing from your perspective, you were in there at the ground level building this, you've had many, many roles in the field of clinical microbiology. And looking back, um, can you comment on, uh, the impact that the LPX program has had?

**Dr. Kathleen Beavis:**

Thank you, Dr. Rauch. I, I think this program has given microbiology technologists the opportunity to demonstrate that they can identify these organisms, notify public health and safely ship these organisms for definitive identification. You know, from the very beginning, I had confidence perhaps misplaced in the ability of the clinical laboratories to detect anthrax in these other agents. One of the other things that we wanted to test with this survey was not just could they get the right answer or the appropriate answer, but could they get the answer in the shortest timeline as possible? You know, and Dr. Rauch, you talked about some of the other features of this survey. One of the ones that I think is unique to this survey is that when laboratories report their suspected identification, they also have to report how long it took for them to notify public health. You know, and again, this was something that we wanted laboratories to let us know for each agent because we wanted to stress the importance of public health in dealing with these. But again, because of this collaboration, laboratories can now call public health 24-7, uh, to report suspicion of these organs and to get the expertise of public health for what the best next steps are.

**Lisa Tomcko:**

So we've heard all about the laboratory preparedness exercise and how it got up and running and, and what an effort that was. Before we wrap up, I want to ask both of you about the legacy of this PT program. How would you characterize the role of LPX in the evolution of public health and laboratory medicine?

**Dr. Carol Rauch:**

So I really look at this as an essential component of what we have to do to be ready in case of a manmade event. And luckily, it's very similar to what we have to do to be ready for things that mother nature throws at us. And I think it's essential because of those tricks that are built into the LPX, such as what Dr. Beavis just mentioned, the timing of notification. So that gets to the teamwork that we need. We can't just bite off a piece and say, did you identify something? You know, and maybe it took three weeks to do it. That's not a good timeframe for a large scale event that could happen. And so, um, a lot of these features are great, but the most salient feature that I look at as the legacy of the building of the LPX and the deployment, which is still ongoing, um, is that it taught us about how to work with each other. The hospital based or, um, commercial clinical laboratories doing patient care testing and the public health environment have to be holding hands very closely. And this particular survey, which comes with a certain frequency, um, makes us think across that potential gap and actually, um, build a bridge there and continue to test it. And so they need us and we need them. And, um, to me that's something that is byproduct of the LPX.

**Dr. Kathleen Beavis:**

I don't know, Dr. Rauch, you said it pretty well. I'm just echoing you. You know, this program, we show that laboratories knew how to identify these threat agents, you know, and we're able to communicate this to public health to get their input. You know, as you mentioned, the survey is continuing. It's facilitating this active and ongoing collaboration between the public health laboratories and the clinical laboratories in their jurisdiction. I'd also like to point out that in the 20 years, over 20 years since this survey began, let's face it, there's been a huge turnover of medical technologists in the laboratory. And I think those who were in the laboratory 20 years ago got the importance of this survey and why we were doing it. You know, and I think it's good to remind our current techs, many of whom were probably just in grade school at the time, <laugh>, you know, and, and remind them of why we're doing this, that, uh, this isn't just an empty exercise.

So, you know, this is a good chance for me to go back into my lab and remind them of some of the background for this. Um, it's important to think about legacy and to look to the future. But I'll be honest, I think it's just as important to look back and to reflect on the foresight and the courage of the College of American Pathologists to develop this survey. And to reassure a scared public. We are celebrating 75 years of proficiency testing. And the laboratory preparedness exercise is yet another example of how the CAP is fulfilling its mission statement, and that is to foster and advocate for excellence in the practice of pathology and laboratory medicine.

**Lisa Tomcko:**

Wow, thank you both, um, so much for, for all those great insights on the LPX program. Just what an amazing initiative it is. So is it maybe fair to say that in addition to helping our clinical laboratories prepare to identify and handle bioterrorism and, and naturally occurring agents, that, uh, a major component of the LPX program is actually about getting clinical laboratories and public health laboratories to work together and communicate in an efficient manner?

**Dr. Kathleen Beavis:**

It starts with the clinical laboratory getting the exercise, you know, and if they are suspicious about an agent, they do call the laboratory. They say that this is part of the laboratory preparedness exercise and notify them. And it's a two-way street because often the public health laboratory will then ask the clinical laboratory to, as an exercise, to mail the specimen to them. And they're looking at how the clinical laboratory packaged it and whether it was safely shipped. So, I mean, this is really good two-way communication, uh, that's coming outta this collaboration. I, I think that's probably the biggest legacy, is the closer collaboration between public health laboratories and the clinical laboratories in their jurisdiction.

**Dr. Carol Rauch:**

Right? It tests not just the nitty gritty benchtop microbiology, but it tests the processes and procedures for how to work together. We haven't really focused on the laboratory response network, but it is testing that when we say the LRN, we are typically referring to the Sentinel Laboratories out there in the hospital environment, for example. And they do their initial job of rule out and refer as necessary to the next level up, which may be the public health laboratory across town or across the state or something like that. So we're testing that whole process and how it all works together. I was asked, I'm sure you two a million times, how big a threat are we prepared, et cetera. And the answer is never a yes or no. It's always, we are continuously preparing. We can't say the likelihood of any of these events happening in our career, um, or our children's future or whatever we hope never, uh, but the effort that we spend on doing this is well spent because it will benefit our ability to respond to all sorts of things that happen on a naturally occurring basis.

**Lisa Tomcko:**

Well, while we hope these incidents of bioterrorism and naturally occurring threats never happen, or at least stay few and far between, I think we can take comfort knowing that there are experienced laboratories and personnel and systems in place to handle them when they do occur. It has been really incredible to learn about the role that the CAP'S laboratory preparedness exercise has had in, in getting us to that point, um, and also keeping us there. A big thank you to both of you for not only your contributions to the LPX proficiency testing program, but for sharing all of these wonderful insights about it with us.

**Dr. Kathleen Beavis:**

Thanks, Lisa. Thanks Dr. Rauch.

**Dr. Rauch:**

Thank you for allowing me the opportunity to look back and to appreciate all that we've accomplished.

**Lisa Tomcko:**

And thank you all for listening to this episode of CAPcast. Stay tuned for more episodes to come in our 75 years of proficiency testing and external quality assessment series. For more information about the CAP, visit, cap.org.