

***Candida auris* in New York Healthcare Facilities**

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

[Sarah Gregory] Hi. I'm Sarah Gregory, and today I'm talking to Dr. Eleanor Adams, a public health physician who supervises the New York Metropolitan Region Healthcare Epidemiology & Infection Control Program. We'll be discussing an outbreak of a fungal infection in health facilities in New York City. Welcome, Dr. Adams.

[Eleanor Adams] Thank you.

[Sarah Gregory] Can we get a bit of biology first? What's the difference between a fungus and a bacteria?

[Eleanor Adams] Certainly. I think biology's always a good way to start. So, bacteria are unicellular organisms, meaning they're composed of a single cell, and they don't have organelles that are enclosed in a membrane or a true nucleus. This might take you back to high school biology a little bit. But, in contrast, fungi, like plants and animals, are multicellular organisms, and we, as humans, are more closely related to fungi than to bacteria.

[Sarah Gregory] Your article is about *Candida auris* in a New York healthcare setting. What is it and how dangerous is it?

[Eleanor Adams] That's a good question. You might be familiar with some other species of *Candida*, such as *Candida albicans*, which is a common cause of oral thrush and urinary tract infections. *Candida auris*, as it turns out, is a related species that's recently emerged in multiple continents and around the globe and, what's concerning is that it's often resistant to antifungal medications. In our paper, we describe the first 51 clinical *Candida auris* cases and we found that all but one of these cases had *Candida auris* that was resistant to a commonly used antifungal drug called Fluconazole. And a quarter were resistant to both Fluconazole and Amphotericin B, which is another antifungal medication option that's not used as frequently, but there aren't that many classes of antifungal medication, so it's a bit worrisome to find a fungus with this type of antifungal resistance.

[Sarah Gregory] And who is at most risk of *Candida auris*?

[Eleanor Adams] So, we found that most of the cases here in New York state have had current medical conditions. For example, they might need respiratory support on a ventilator or have neurologic disease or diabetes, just to name a few examples. And we also found that the majority of our patients had spent a lot of time, recently, in healthcare facilities, especially hospitals and nursing homes. And we also found it interesting that we actually *aren't* seeing *Candida auris* in some populations for which one might commonly see fungal diseases, such as children, and we also haven't seen it in otherwise healthy people in the community yet, I will say.

[Sarah Gregory] There seems to be a problem with labs misidentifying it and it's often resistant, as you said, to antifungal drugs. How does this happen? Antimicrobial resistance is due to over use. Why are fungi becoming resistant, and does this impact patient care?

[Eleanor Adams] So, we've been very lucky because our colleagues at our state laboratory, which is called Wadsworth Center, found, by looking at the first 99 cases that they received, that over a third had originally been misidentified as a related species which is called *Candida*

haemulonii and there were also 13 other yeasts that were sent up that had not been identified and 11 were found to be *Candida auris*. So all this is to say that *Candida auris*, you know, was initially very hard to identify, but our lab has learned under what conditions it likes to grow in culture and have developed other techniques, such as RT-PCR, and we've also found that other diagnostic devices that are used in labs have been able to update their reference databases. So, identification has definitely improved but this has definitely been a challenge, especially, you know, when this was initially emerging. And to answer your second question of why are fungi becoming resistant, I think I'd say, you know, I wish I knew the answer to that. For *Candida auris* in particular, you know, we're not quite sure, but we do know that some species of fungi are naturally resistant to treatment with certain antifungal medications and there's a good chance that could be the case with *Candida auris*, given the high rate of resistance to Fluconazole, but we also know that some species can develop resistance over time, due to antifungal overuse, and, you know, that's similar to something we see with bacteria, with antibiotic overuse. And this also probably is true for *Candida auris*, as well. In other countries, it has developed additional resistance very rapidly and we're watching to see if that happens here.

[Sarah Gregory] Okay, so it was found in New York City and epidemiologists traced patients' contact[s] and tested them for the fungus. Can you explain what that process looked like?

[Eleanor Adams] Sure. So, once we found our first few cases, we did quite a bit of true 'gumshoe epi', so this is boots-on-the-ground type of work. So, we have excellent nursing home and hospital partners and they helped us track these patients and their contacts. So basically, we started with phone calls and said, where have these patients been, and then tried to see who they had come in contact with in the past 90 days—so, who were their roommates, did they have any procedures where they could have been close to other patients—that sort of work. And then we tried to locate *those* contacts and swab them to see if they were colonized with *Candida auris*. And that means we were looking to see if they had *Candida auris* on their body but didn't have an active infection, but we were trying to see if it had spread in that way. And all of this was done by a special team that we put together to respond to this pathogen and we did many other activities, as well. We swabbed patient environments to learn about how this acted in the environment; we had educational sessions to increase awareness and get the word out, so to speak; and we also were very lucky that our state lab, Wadsworth Center, surged it's capacity, really, testing thousands of specimens, which is many more than their usual volume of work. So, this process has been very detailed, very resource-intensive, but seems to be worth the effort.

[Sarah Gregory] Your study also examined the infection control precautions at some of the affected healthcare facilities. What did this examination reveal?

[Eleanor Adams] So that's correct. We did conduct quite a few infection control assessments and we found that adherence to the recommended infection control practices and recommendations, some of which were very new, did vary. And we did find some specific areas where infection control could be improved. As an example, we found places where more alcohol-based hand sanitizer dispensers could be installed, to make it easier for staff to perform hand hygiene, and we found some areas where it would be better to post clear isolation signs, just to give you a few examples. And we were very lucky that our facility partners have worked hard to make the changes, but this still, you know, illustrated, you know, the challenge that a new, emerging pathogen with new infection control recommendations can pose.

[Sarah Gregory] Was the investigation able to track down the source of these infections?

[Eleanor Adams] Well, that's good question. I think the answer is yes and no. So, CDC's laboratory conducted some testing to look at the genetic relatedness of our isolates in New York, and they did find that most were highly related and related to a clade of *Candida auris* that was from southeast Asia. So, we likely did have introduction from abroad and then subsequent local spread, but I can't tell you, you know, the exact time that this was imported into New York, or the exact case. So, I think there's still a mystery that we'll probably never fully unravel.

[Sarah Gregory] So, the data you looked at was from July 2016 to April 2017. Are there still any confirmed cases of it in New York City?

[Eleanor Adams] Yes. We still continue to find new cases. We are seeing what I would say would be a steady increase in clinical cases, but we haven't actually seen an exponential increase, which hopefully means that our case tracking and infection control efforts are making an impact, but we'll have to see the trajectory as time goes on.

[Sarah Gregory] Is this outbreak somehow endemic to New York or can healthcare facilities in other states be experiencing it and not necessarily be aware of it?

[Eleanor Adams] Well, it has been found in at least 10 other states, with the most cases in New Jersey and Illinois and, since laboratory identification is difficult, it could be in other states, but, I think, over the past two years, laboratories have started to look harder for this and they're now regional laboratories that can test a suspicious isolate. So, hopefully, we're detecting most of the *Candida auris* out there.

[Sarah Gregory] Okay. And one final question, Dr. Adams. How did you become interested in this issue?

[Eleanor Adams] Well, that's a good question. I have always loved public health epidemiology and have loved tracking the latest disease. I will say that, sometimes, the organism picks you and that's what seems to have happened with us here in New York with *Candida auris*. But I'm lucky. I've got a great team that's passionate about protecting our most vulnerable patients and, you know, that's very motivating to work with such a dedicated group and dedicated partners. And, honestly, how can you not be interested in a newly emerging fungal species, you know, with a name like *auris*, which is the Latin word for 'ear,' you know, this is, this is just fascinating stuff.

[Sarah Gregory] Okay, well thank you, Dr. Adams, for taking the time to talk with us today. Listeners can read the October 2018 article, "*Candida auris* in Healthcare Facilities, New York, USA, 2013-2017," online at [cdc.gov/eid](https://www.cdc.gov/eid).

I'm Sarah Gregory for Emerging Infectious Diseases.

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