Good afternoon. I'm Captain Ibad Khan. I'm representing the Clinician Outreach and Communication Activity, COCA, with the Office of Emergency Risk Communication at the Centers for Disease Control and Prevention. I'd like to welcome you to today's COCA Call: The Path of Yeast Resistance, Drug Resistant *Candida* on the Rise. All participants joining us today are in listen-only mode.

To view live captions, choose “More” from your menu bar. Choose “language and speech”, then click “show” live app captions. If you'd prefer to view only the content on the slides without the distraction of seeing the thumbnail view of the gallery of attendees, you may wish to switch your settings to focus mode. To enable Focus mode once again, go to your menu bar, click “view”, then choose “focus on content.”

Free continuing education is offered for this webinar and instructions on how to earn continuing education will be provided at the end of the call. In compliance with continuing education requirements, all planners, presenters and moderators must disclose all financial relationships in any amount with ineligible companies over the previous 24 months, as well as any use of unlabeled product or products under investigational use. CDC. Our planners, presenters and moderator wish to disclose they have no financial relationships with ineligible companies whose primary business is producing marketing, selling, reselling or distributing healthcare products used by or on patients. Content will not include any discussion of the unlabeled use of product or product under investigational use, with the exception of Dr. Meghan Lyman's discussion of several antifungal medications in clinical trials for *C. auris* and availability of use under expanded access programs.

CDC did not accept financial or in-kind support from ineligible companies for discontinuing education activity. CDC complies with applicable federal civil rights laws and does not discriminate based on race, color, national origin, age, disability, religion or sex. To learn more, visit www.hhsgov forward slash civil rights. At the conclusion of today's session, participants will be able to accomplish the following.

Describe the increasing prevalence of resistant *Candida* species. Explain the epidemiology of emerging resisting *Candida*. Outline appropriate testing, including species identification, antifungal susceptibility testing, and whole genome sequencing, and summarize treatment options and resources for resistant *Candida* species. After the presentations, there will be a Q and A session. You may submit questions at any time during today's presentation via the MS Teams platform.

Please note the ability to ask a question during live webinar in MS Teams is limited to the first 1000 attendees. If you're unable to ask a question during the webinar, you may submit your question after the live session by emailing coca@cdc.gov. Please note we receive many more questions than we can answer during our webinars. If you are a patient, please refer your question to your healthcare provider.

If you are a member of the media, please contact CDC Media relations at 404-639-3286 or send an e-mail to media@cdc.gov. I would now like to welcome our presenters for today's COCA Call. We are very pleased to have with us Dr. Meghan Lyman, the acting (deputy) branch chief in the Mycotic Diseases Branch in the Division of Foodborne, Waterborne and Environmental Diseases at the National Center for Emerging and Zoonotic Infectious Diseases at CDC and Dr. Dallas Smith, who's an epidemiologist in the Mycotic Diseases Branch at CDC's Division of Foodborne, Waterborne Environmental Diseases at the National Center for Emerging and Zoonotic Infectious Diseases. I will now turn it over to Dr. Lyman.

Dr. Lyman, please proceed. Thank you. We're really glad to have the opportunity to share with you information about increases in drug-resistant *Candida* and this path of yeast resistance that we believe are concerning and important for you to know about. I'll start us out by focusing on a kind of resistant *Candida auris* and my colleague will then present on fluconazole resistant *Candida parapsilosis*. Next slide.

And since this was already covered, I won't spend any additional time on the objectives of this session. Next slide. And starting with the basics typically *Candida* infections are autoinfections caused by strains that already exist among a person's own flora or microbiome often in their gut which can then invade the blood or deep organs or grow out of control in other body sites. So, it's often not spread person to person and outbreaks are rare. Resistance depends on the species but historically has been fairly low.

Especially among *Candida albicans* which has been the most common species of *Candida* next slide. The *Candida auris* behaves differently from other species and these characteristics are what make *Candida auris* so concerning. It's often. It's most often resistant to at least one antifungal, but frequently resistant to more than one. Patient's skin remains colonized for a long period of time, and they shed it into the environment where it can also persist on surfaces for weeks.

Because of this it results in health care associated transmission and outbreaks, and like other species it can cause invasive infections with high morbidity and mortality. Next slide. And looking at the resistance profile for isolates in the US tested through the AR Lab Network almost all are resistant to azoles like fluconazole about 15% are resistant to

polyenes like Amphotericin B, and less than 1% are resistant to a kind of candins which is why this is the preferred treatment. Next slide. It's something to keep in mind is that there are currently no official susceptibility break points established for *Candida auris*, the tentative break points that have been published by CDC are defined based on those for closely related *Candida* species and expert opinion.

But the correlation between these breakpoints and clinical outcomes is not currently known. Next slide. So, I'll pause for a quick knowledge check. *Candida auris* is most often resistant to which type of antifungal? Fluconazole; amphotericin B; echinocandins; or flucytosine. And the correct answer is.

A. fluconazole. Next slide. The first three cases of pan resistant *Candida auris* which is resistant to all three classes of antifungals were reported in 2019 in New York. These three cases were unrelated to each other with no epidemiologic links, and each seemed to develop resistance after receiving echinocandin therapy.

Extensive screening and environmental sampling found no other pan resistant strains so, transmission did not seem to be a concern perhaps because of a fitness cost related to pan resistance. Next slide. But in 2021, there were 2 independent clusters of pan resistant or echinocandin resistant cases. A cluster in Washington DC with 3 cases and a cluster in Texas with 7 cases none of these patients had received echinocandins previously, so this was the first evidence that transmission of echinocandin or pan resistant strains was possible. Next slide.

Even though echinocandin-resistant isolates only make up less than 1% of all isolates since that time the number of echinocandin isolates including pan resistant isolates has steadily increased as you can see in red from data from CDC 's AR lab network. And just to keep in mind this is deduplicated data so multiple isolates from the same patient were excluded. Next slide. Looking into the epidemiologic characteristics of 93 recent echinocandin-resistant cases between August 2023 and December 2024, we found that 85% of specimens were collected at acute care hospitals. And 92% were clinical cases not from screening swabs but from clinical specimens which are most commonly collected in acute care hospital settings and more likely to get susceptibility testing.

More than 50% of specimens were from urine reflecting that low echinocandin levels in urine may promote development of resistance. And 56% had prior echinocandin use documented in medical chart review even though there may be limitations in capturing all antifungal exposures and documentation of some antifungal use may not have been available. Even so this does suggest a mix of resistance developed both on treatment, as well as acquired through transmission. Next slide. We have learned a lot about the genomic

epidemiology of *Candida auris* and echinocandin-resistant strains through whole genome sequencing.

Candida auris overall demonstrates low genetic diversity within clades. Echinocandin resistance has been detected among all 3 major clades circulating in the US as you can see on the right. Almost all 92% of echinocandin-resistant isolates had a mutation. In the FKS one gene, this is the most common gene having mutations associated with echinocandin resistance. And we have identified clusters of multiple echinocandin-resistant isolates in the same geographic area which were genetically very closely relate--suggesting transmission.

Studies have also shown that echinocandin-resistant isolates were closely related to other susceptible isolates in the same patient and occurred after echinocandin exposure. This suggesting development of resistance on treatment not transmission. I do want to note that one major challenge with using whole genome sequencing to detect mutations associated with echinocandin resistance is that whole genome sequencing is often not CLIA-validated and cannot be used for patient care. Next slide. So hopefully this information highlights how important laboratory testing is to detect cases of echinocandin-resistant *Candida auris* and guide patient treatment.

Species identification is not always performed for non-sterile specimens like urine or sputum, but doing this can enhance detection of *Candida auris* and has been successful in detecting cases sometimes even a first case in a region. But antifungal susceptibility testing is necessary to identify echinocandin resistance and determine the best treatment options especially among patients not responding to treatment. Whole genome sequencing is a tool that can identify mutations linked to echinocandin resistance, but unfortunately the results are not available to guide patient treatment in many cases. Next slide. Unfortunately, clinical data about antifungal treatment for echinocandin-resistant cases is limited but I'll outline some options that can be considered.

The first is higher doses of echinocandins which can be considered to achieve higher therapeutic concentrations. A second generation of echinocandins Rezafungin has less frequent but high front loaded dosing and initial anecdotal evidence suggests it works against echinocandins-resistant *C. auris* and other echinocandin-resistant *Candida*. Two additional newer medications that are available through expanded access programs and show promising results against echinocandins-resistant *Candida auris* are Ibrexafungerp and Fosmanogepix. So, the first Fosmanogepix is a novel antifungal in phase 3 clinical trials, And Ibrexafungerp which is already approved for treatment of vulvovaginal Candidiasis.

Has released data from phase 3 clinical trials although there have been some delays in getting some current delays in getting access to this drug But hopefully that will not be a long-term issue. Combination treatment of more than one antifungal has shown inconsistent in vitro data and unfortunately clinical real life clinical data is not currently available. So more clinical data is desperately needed to guide recommendations and just a plug that echinocandin-resistant isolates have been added to CDC 's AR bank. Next slide. Infection prevention and control measures for echinocandin-resistant strains are the same as those for all other *Candida* aura strains and again, as a reminder these are basic IPC measures like you see at the bottom of the slide including good hand hygiene using alcohol-based hand sanitizer, contact precautions or enhanced barrier precautions in nursing homes involving gown and glove use, and thorough cleaning and disinfection using List P products approved for use against *Candida auris*, however, adherence to IPC measures is even more important for echinocandin-resistant cases to prevent any transmission to others.

And any subsequent infections that would be difficult or even impossible to treat. Next slide. Another knowledge check question: Are special infection control precautions needed for echinocandin-resistant *C. auris*? A. No, only standard precautions are needed, B.

Yes, contact precautions or enhanced barrier precautions are needed, just like all strains of *C. auris*, and C. Yes, but additional precautions are needed for echinocandin-resistant strains, above and beyond what is needed for all other echinocandin-susceptible strains. And the correct answer is B that contact precautions or enhanced barrier precautions are needed just like all strains of *C. auris*, next slide.

So, to summarize although it's not common the number of a echinocandin-resistant cases is steadily increasing likely as a result of both resistance developed as a result of antifungal treatment as well as transmission of resistant strains. And it's important to keep this in mind first testing and treatment decisions and additional incentive to ensure good infection prevention and control compliance to prevent additional spread. Next slide. And I'll finish with one last knowledge check. How does echinocandin resistance develop among C.

auris? A. On treatment due to antifungal pressure? B. Resistant strains spread between patients. C. Both A&B, and D.

neither A or B. And the correct answer is C both A&B. So now I'll hand it over to my colleague Dallas Smith. Thank you so much, Meghan. So now we're going to be transitioning from talking about *Candida auris*, to another *Candida* species called *Candida parapsilosis*, next slide please.

So, *Candida parapsilosis*, like most *Candida* species, causes bloodstream infections, also known as candidemia. Through our emerging infections program surveillance, national surveillance in the United States, we see that *Candida parapsilosis* is the third most common cause of fungal bloodstream infections, as you can see on the figure to the right, we see these infections that are common in premature neonates, persons with cancer or COVID-19 and also organ transplant recipients. Next slide, please. And so, when we think about *Candida parapsilosis* bloodstream infections, the risk factors are pretty similar to other causes of candidemia. These include previous abdominal surgeries, total parenteral nutrition, fungal colonization, central venous catheters, misuse or overuse of broad-spectrum antibiotics, septic shock, and renal replacement therapy. However, the thing that distinguishes *Candida parapsilosis* from most other *Candida* species is that this species can persist on healthcare surfaces and healthcare worker's hands, facilitating spread among patients, which you may be thinking this kind of reminds you of *Candida auris*. And so, *Candida parapsilosis* can form biofilms. And because it can spread person to person or facility to facility, this can cause outbreaks. Next slide please.

Historically, when we think about *Candida parapsilosis*, it was mostly susceptible to fluconazole. And we weren't too concerned about antifungal resistance. Next slide, please. And as you can imagine from the title of our presentation, we are seeing the global emergence of fluconazole-resistant *Candida parapsilosis* and in some countries 60% of isolates of fluke of *Candida parapsilosis* are resistant to fluconazole. This is a really nice map showing different levels of resistant rates in many parts of the world, including in North America, including in the United States.

Next slide please. And so. Over these years, from 2012 to 2022, we have seen that at least 16 countries have reported fluconazole-resistant *Candida parapsilosis*. This is likely severe underestimation. Just due to access to the ability to speciate, but also to do antifungal stability testing to see if it is indeed resistant to fluconazole.

Next slide please. And when we think about the clinical impact of this resistance, we see that in some estimates, some data suggests that mortality rates for *Candida parapsilosis* candidemia cases are twice as high for those with fluconazole-resistant isolates compared to susceptible isolates, and this could be from a variety of reasons, and we'll talk about some specific steps that clinicians can take to be able to decrease this mortality rate. next slide please. But before that, I want to talk a little bit about, well, what is driving this resistance. Or at least what are the mutations that are leading to fluconazole resistance? And what we see is that most fluconazole-resistant *Candida parapsilosis* strains often

carry a ERG 11 mutation and the ERG 11 is a key enzyme involved in the ergosterol biosynthetic pathway, which is a critical component to the functioning of this fungus.

Next slide please. And so, we wanted to explore the picture of fluconazole-resistant *Candida parapsilosis* a bit more in the United States. So, when looking through our emerging infections program and looking at the most up-to-date data that we have in 2025, we see that the overall trend of resistance is increasing steadily over the years. You can see that in 2023, we had about 19% of isolates were resistant. And 2025 today we almost have 14% resistance.

We are still finalizing data for 2024 and so stay tuned for more information. But as you can see from this this curve, we are seeing increase in resistance in *Candida parapsilosis* to fluconazole next slide please. We wanted to investigate this resistance a bit more, and so when we're utilizing this emerging infections program, candidemia surveillance, we saw an increase in resistance in bloodstream infections in 2021 in Atlanta, where some of us are based right now on this call and what we saw when we looked at the data was that 30% only 30% of these resistant cases had received prior azole treatment in the prior 30 days. And of course this is documented azole treatment, so it could have been missed. But this was still a low number that may explain that may lead to people thinking this may not have been due to treatment pressure and so we wanted to explore this rise a bit more.

Next slide please. And so when we look at the EPI data, we compared patients who had resistant strains versus non resistant strains to fluconazole and we saw that people with resistant strains were admitted to a long term acute care hospital in the last 90 days were more likely to be admitted to a long term hospital in the last 90 days and were more likely to be mechanically ventilated in the prior 30 days. Next slide please. But what was more interesting is that we took those isolates that were resistant to fluconazole, and we did whole genome sequencing on several of them. And what we found was that all of these were genetically similar.

You can see in the box the blue box with all of the red little dots. Those are all the isolates that were resistant to fluconazole, and you can see they're clustering very close together. And so, when we thought about this in the larger context of the rise, this actually suggests transmission of a single resistant strain to not only the same facility but different facilities in the Atlanta area. And so, this is a really big concern for us because not only are we seeing more resistance, it's not actually due completely from prior azole use, we are seeing resistant strains spread from facility to facility in regions. Next slide please.

And so, we wanted to see well, is this happening globally? And yes, the answer is yes, it has. And so, we have seen healthcare transmission of fluconazole-resistant *Candida*

parapsilosis in many countries around the globe and this could even this could be either be within a facility or between facilities. And I just put some examples on our screen, but this has happened in other countries as well, you can see in Brazil. In Turkey, in France and several other countries. Next slide please.

And so now I want to talk about 3 actions that clinicians can take to help address fluconazole-resistant *Candida parapsilosis* in the United States and globally. The three I'm going to be talking about includes empiric therapy, 2: species of identification and 3: antifungal stability testing. Next slide please. So, first echinocandins are recommended as the initial treatment for candidemia. When we looked at data from our national surveillance, we saw that around 30% of candidemia is treated first or initially with fluconazole in the United States.

And because we're seeing growing azole resistance in *Candida parapsilosis*, but along with other species as well, including *Candida auris*, we think that fluconazole is going to be ineffective for many of these infections, empirically. We also see that data suggests lower mortality with a echinocandins used empirically. And I just want to reemphasize that global guidelines and guidelines by the Infectious Diseases Society of America do recommend it. echinocandins as initial treatment or as impaired treatment for candidemia. next slide please.

#2 it's critical to be able to speciate or have a species level identification on all *Candida* isolates that do require treatment. As we just talked about, we are seeing certain species like *Candida parapsilosis* that are increasingly resistant to antifungals like fluconazole that historically might have been used empirically. Clinicians should be requesting species level identification on all *Candida* isolates requiring treatment. And this is because management may change based on the species. While you're awaiting antifungal susceptibility testing, which may take a little longer than species identification and so the species you identify could inform empiric therapy.

Next slide, please. And one of the most important aspects of addressing fluconazole-resistant *Candida parapsilosis* is sending cultures for antifungal susceptibility testing. These results can inform step down therapy. Hopefully at this point that echinocandin is being used empirically. But there might be opportunities to step down to fluconazole if it is indeed susceptible.

Additionally, public health and clinicians can monitor for antifungal resistance patterns regionally and at a facility level to inform antifungal stewardship, empiric therapy, and interventions to address emerging yeast. Next slide please. And so, I want to pause quickly for a knowledge check question. And so, the question is which of the following is a primary

mode of transmission for *Candida parapsilosis* in healthcare settings? A. Airborne transmission through respiratory droplets.

B. Direct contact with contaminated surfaces or medical equipment. C. Vector- borne transmission via insects D. Transmission through contaminated food and water.

Next slide please. And so the correct answer is B. Direct contact with contaminated surfaces or medical equipment. And I just wanted to reemphasize that *Candida parapsilosis* behaves differently than most *Candida* species. We are seeing that it may behave similar to *Candida auris*, although we do need additional data to see how we can inform infection prevention control.

Next slide please. So that is the end of the presentation about *Candida parapsilosis*, but I just want to make a quick plug for a new service that we are offering here at the Mycotic Diseases Branch. We are offering a clinical consult service specifically for clinicians who have questions about fungal diseases diagnosis. Trying to diagnose a fungal disease or if they need assistance in managing a fungal disease and so you can reach out to us through our phone number. 404-639-5168 or through our e-mail fungalconsult@cdc.gov. We will respond within 24 to 48 hours, and we will be able to connect you with mycologists in the United States who will treat these diseases on a regular basis, and this is for *Candida parapsilosis*, *Candida auris*, or any other fungal infection, whether it be on the skin or invasive. Next slide please. And finally, from the fun guys and fun gals here at the Mycotic Diseases Branch, we want to wish everyone a Happy Fungal Disease Awareness Week. Please help us celebrate and raise awareness of fungal diseases.

We have specific themes for each day, and we'd really enjoy your engagement with us in terms of raising awareness of fungal diseases and a special thanks to our colleague here at our branch Ana Baker for helping to prepare this presentation. So I'm going to turn it back to our moderator. At this point. Presenters, thank you so much for providing this timely information to our audience. We will now go into our Q&A session.

Audience, you may submit questions via the Microsoft Teams platform, again, please note the ability to ask a question during the live webinar is limited by Microsoft Teams to the first 1000 attendees. If you are unable to ask a question during the webinar, you may submit your question after the live session by emailing coca@cdc.gov. So, we're going to start by asking question about colonization.

We have a couple of questions focused on *Candida auris* colonization. The first one asks how long can patients remain colonized with echinocandin-resistant *C. auris*? Sure, I can answer this one. There is evidence that patients remain colonized with *Candida auris* for long periods of time especially those with frequent or prolonged health care stays. But

there isn't evidence to suggest that echinocandin-resistant cases would be any different although this specific topic hasn't been studied specifically for echinocandin-resistant cases.

Thank you very much. And like I said, we have a few of these. So, a follow up question to that is: Do we have data yet on whether patients colonize with *C. auris* can be decolonized? Sure, I can answer this too. That's a great question and I know one that we are really interested in here at CDC and I know a lot of people are but it's really challenging because colonized patients can have multiple negative swabs before having another positive swab.

So, it's really difficult to determine when someone is no longer colonized, and a product or decolonizing strategy was successful? You know one or 2 or 3 swabs we found is not sufficient to show that they are no longer colonized. There is data that high concentrations of chlorhexidine does kill *Candida auris* but testing of skin levels often doesn't reach those levels and as you can imagine it may not be applied to all colonized body sites. And, we have seen that there are facilities using CHG bathing that have had transmission so in the real world it doesn't seem to be sufficient to, you know, fully stop transmission and be kind of a magic bullet. But there are many researchers and companies interested in exploring new products and this is a topic like I said that is of a lot of interest to CDC so hopefully something we'll learn more about in the future. Thank you very much.

Another theme we are seeing in the questions are about states requiring isolates of the two *Candida* species to be sent to them for further EPI testing, as well as if the *Candida parapsilosis* is a reportable condition for states. I can go ahead and jump in on this one. This is Dallas. So, the only *Candida* species that is a reportable as a nationally notifiable condition is *Candida auris* at this time. And so, *Candida parapsilosis* is not a reportable or national viable disease.

We do encourage clinicians to perform antifungal treatment to see if they are seeing fluconazole resistance and of course, having a conversation with their local or state health department to inform them of the findings I think would be very appreciated from local and state health departments. Thank you very much. Our next question asks can a patient have both echinocandin-resistant and echinocandin-susceptible *Candida*? Sure, I'll answer this. There have been reports of patients that have been colonized with 2 different clades of *Candida auris* and just in general the skin is colonized with a population of *Candida* strains including some that could be susceptible, and some that are resistant. There's some research on *Candida albicans* that shows a mix of strains in different body sites.

That a person's colonized with a mix of strains. But when they actually develop an infection like for instance vulvovaginal candidiasis then that site changes to just have one single strain. So that's for *Candida albicans* we don't have that data for *Candida auris* but imagine the same is probably true? In a patient selective pressures are also an important factor contributing to what strains they're colonized with and if those are resistant or not like if they've been exposed to antifungals. So yes, but I will say for treatment purposes once someone has had echinocandin- resistant strain, I would consider this a concern for future infections although even then there's limited data and guidance obviously about what to use to treat it. Thank you very much.

We also have, as you can imagine, several questions about resistance specific to treatment modalities. Our first question in that vein asks when you say there's high rates of azole resistance with *Candida auris*, are you referring specifically to fluconazole resistance in *C. auris*? Is there data for using voriconazole or posaconazole for *C. auris*? Usually there's a lot of similarity between fluconazole and voriconazole so there could be some subtle differences, but you know I think in general it's safest to unless you can do susceptibility testing to assume that it will be resistant to all azoles. But if there are challenges with treatment and you're able to do actual susceptibility testing to look at whether it's susceptible to voriconazole, that's a great option, but more often than not they are similar.

Thank you very much. Our next question asks are there specific characteristics that you found in these antimicrobials that tend to favor resistance? I can jump in here and so I think what the question is asking, I want to rephrase that a little bit. Fungi are eukaryotic organisms, and though they're really good at adapting and evolving. And so, I would actually say the fungi are just able to modify themselves and have these mutations so that they become more resistant to our antifungals, which is a growing problem as we've addressed in in both of these presentations today. Thank you very much.

Our next question said that your slides showed that resistance to polyenes is low, but they were not the preferred drug of choice. Could you please elaborate if this recommendation is for all drugs in that class? Or just I guess they mean for amphotericin B. or all, just trying to read more into the question. Yeah, I can start, Dallas, obviously you can chime in too.

Amphotericin B is the main polyene that would be used to treat Candidiasis especially these like invasive forms, but it has a lot of side effects, and toxicity, and so for that reason, it's not preferable. Also, the resistance to amphotericin has changed over time so it's actually you know varied quite a bit. So, it has been higher in previous years, and it seems that some strains that have lower resistance amphotericin have had more transmission and are more common at this time. But mostly the reason that it's not a preferred treatment is just because of the side effects and toxicity that it causes. Thank you very much.

We have a few questions specific to healthcare settings. First question asks in a long-term care setting, how would you define a *Candida auris* outbreak? That's a really tough question and I think it really depends on what's happening locally which is why we don't have kind of one answer one simple answer because it is complicated. You know in an area where there's never been a case, one case could count as an outbreak and you know trigger an investigation, screening. In other places where it's common in that area and maybe there's a lot of *Candida auris* circulating in the region, they're more likely to kind of have a baseline. So, an outbreak maybe increase in detections over their baseline an increase of clinical infections or bloodstream infections.

So, it's really an increase from what the baseline is either in the facility or regionally. Thank you very much and it appears we have multiple questions about infection prevention and control. So, summarizing them, can you please talk about what enhanced barrier precautions or other infection prevention control modalities you recommend, especially if you can stratify them based on practice setting if possible. I that's a pretty general question. I will stay for *Candida auris*, enhanced barrier precautions are recommended for nursing homes and contact precautions are recommended for hospitals, acute care hospitals, and long-term acute care hospitals.

And this is for *Candida auris*. For *Candida parapsilosis*, there are not recommendations for anything beyond standard precautions. It's a pretty common bug *Candida parapsilosis* and you know our concerns about fluconazole-resistant *Candida parapsilosis,* and the spread are concerning but we are still exploring. And there's you know limited data right now. So, there it may be that in the future there are recommendations for contact precautions or enhanced barrier precautions for *Candida parapsilosis*.

But there aren't current recommendations for that now. Yeah. Thank you very much. Our next question asks is the resistance profile for the various *Candida* in other nations similar to what we are experiencing or observing in the US? So, I can talk specifically about *Candida parapsilosis* and so in the presentation I gave a few examples of just how common or the percentage of isolates of *Candida parapsilosis* that are resistant to fluconazole. In some countries they are higher than in the United States.

As I mentioned some countries have up to 60% of isolates that are resistant to fluconazole. While some countries may be lower than ours. Too, but I will say that we have very robust surveillance of candidemia in the United States. And so, we still need to figure out globally what resistance looks like in the absence of maybe routine surveillance of candidemia in general and of *Candida parapsilosis*.

And in the same probably applies for *Candida auris*. We know that there are echinocandin-resistant and pan-resistant strains detected in other countries, but the testing capacity varies in different countries antifungal susceptibility testing is not an easy test and it's not always available. And that's the only way to really, you know detect these resistance patterns. And also, echinocandins medication are often not available in other countries so that will definitely affect the antifungal pressure that may drive resistance. Thank you very much.

Our next question asks if we are cohorting *Candida auris* patients, can you share your thoughts on separating patients by echinocandin-resistant versus echinocandin-susceptible status? That's a great question. That's something that I think would require some thinking through a lot of places don't have a ton of ability to do such nuanced cohorting and it's something that we you know may want to consult with the health department and even us at CDC about because it could get very complicated. And often times you know patients who are screened all the screens are not necessarily getting susceptibility testing to know if they are echinocandin-resistant. And before you started doing that cohorting you would really want to know someone 's status beforehand.

And you know I think the most important thing is if there are concerns about transmission really implementing good infection control to prevent transmission and really focusing on that. Thank you. And we have time for one last question and the question looks ahead to the future and asks. Do you? Can you share your? Any insight you have on the pipeline approval of medications that are currently either in clinical trials or some stage of development that may help against this sort of emerging issue that we're facing? I'll just say that I think it's one of the better times for antifungal development it you know previously there were not many new medications. And recently there have been multiple ones.

So, I think we're really lucky to have those as an option and really excited about them and you know the results are very promising. So, I guess just to say. Very optimistic for that and hopefully there will continue to be interest. But Dallas, especially considering he's a pharmacist, I definitely want him to weigh in as well. Yeah, I totally agree, Meghan.

I think this is, although we can always use more antifungals, this is a promising time in antifungal development. Fosmanogepix which we're really excited about for *Candida auris* is in phase three clinical trials. It kind of just started and so that looks like it's going to be several years away, but I just wanted to mention that we currently have newer antifungals that are FDA-approved maybe not for *Candida auris*, or even candidemia, but thinking through how we can form clinical trials with those new drugs like Ibrexafungerp, for example, I think could be really promising because they have a new mechanism of action. When looking in vitro testing it looks very promising as well, and so thinking through well,

how can we repurpose the newer antifungals that maybe doesn't have clinical trials yet for candidemia, *Candida auris*, fluconazole-resistant *Candida parapsilosis* I think is very exciting to think about. Hopefully, we can make pushes to see how well these antifungals hold up in clinical settings.

Great. And with that, I want to thank everyone with a special thanks to our presenters for sharing their time and expertise with us. CDC has fully transitioned from the training and continuing education online (TCEO) system that provides access to CDC educational activities for continuing education to CDC TRAIN. If you do not already have a TRAIN account, please create one at www. train.org.

All new activities that offer CE from CDC will only be listed in CDC TRAIN. CDC TRAIN is a gateway into the trained learning network, the most comprehensive catalog of shared public health training opportunities. This transition will allow you to access noncredit and for credit educational activities and track your learning including CE in one place. Many CDC accredited activities are already listed in CDC TRAIN.

The move to one system improves efficiency and makes it easier for learners, CDC staff, and partners to offer and earn CE in one place. You can access and download CE transcripts and certificates in TCEO through the end of 2025. Instructions will be available on both platforms and a learner support team will be available to answer your questions. All continuing education for COCA Calls is issued online through CDC TRAIN. Those who participate in today's live COCA Call and wish to receive continuing education, please complete the online evaluation and posttest by October 20, 2025, with the course code WC4520R-091825.

The registration code is COCA091825. Those who will participate in the on-demand activity and wish to receive continuing education should complete the online evaluation between October 21, 2025, and October 21, 2027, and use course code. WD4520R-091825. The fully closed-captioned video and transcript of today's COCA Call will be available on demand next week at www.cdc.gov/coca. For more details about this COCA Call and other upcoming COCA Calls, subscribe to receive announcements for future COCA Calls please visit www.cdc gov/coca/hcp/trainings/index.html You will also receive other COCA products to help keep you informed about emerging and existing public health topics.

Again, thank you for joining us for today's COCA Call and have a great day.