Chlamydia, Gonorrhea, DGI, and MGen Transcript

DEMYSTIFYING HIV/STI TESTING, TREATMENT, AND PREVENTION WEBINAR SERIES

All right. Hi everybody. Thank you for joining us today. We're just going to give it about a minute or so to give people time to join. So we'll get started though pretty soon. Everybody, good afternoon.

I have 12:03 and I know we have a fair amount to cover today so we will get started.
I'm Beth Gyllstrom from the Minnesota Department of Health and I'm pleased to welcome you to the third and final session in our three-part series of demos titled HIV/STI Testing, Treatment, and Prevention, which we are hosting in collaboration with the Minnesota Medical Association. So, a few quick housekeeping items. Qe are recording this session. If you could please hold your questions until the end or you can also put them in the Q&A and we'll try to address them during the session if we have time. We'll also post the evaluation link towards the end of the presentation, but we'll send it out as well via e-mail and then we are compiling questions, and so if we don't get to them, we'll also just post them with the recorded sessions on our website after the series is complete. So with no further ado, it's my pleasure to introduce our speaker today, Dr. Nick Lenhertz. Dr. Lenhertz is a physician and medical epidemiologist specializing in infectious disease epidemiology prevention and control at the Minnesota Department of Health.
His work includes responding to novel and emerging infectious outbreaks such as SARS Co V2 and mpox, creating strategies to reduce the risk of acquiring HIV and understanding the drivers, barriers to healthcare utilization, especially among disproportionately impacted populations.
So Nick, take it away.

Thanks, Beth. Hey everybody, I'm turn my camera off and then we'll get started. And as usual, I got a ton of stuff to go through today, so we'll try to make it quick.
I want to start off with a couple of cases though, and you know I had a case presentation for syphilis and I didn't have one for HIV, but I do want to have one here in these cases. Well, let's just go through them and then and then we'll discuss. So here we go.

Case number one. We have a thirtysomething male living with HIV reporting MSM activity who is seen at an outside clinic, and he presents with multiple discrete erythematous lesions on his hand, his pubis, his penis, scrotum, butt, and inner thighs. Other than that, he feels fine. No other systemic complaints. He is treated empirically for syphilis, and he tests positive for rectal gonorrhea, and they treat him with IM ceftriaxone. He does report that others in his sexual network have similar issues.

So now we have mystery case number two and around the same time another thirtysomething year-old male living with HIV reporting MSM activity presents to an outside clinic. And he has very similar presentation, multiple discrete erythematous lesions on his lower abdomen, buttocks, his wrist and his thighs, and he otherwise feels OK. He again is treated empirically for syphilis, but his RPR comes back as non-reactive. Patient did think he had jock itch and so he

self-treated with over-the-counter clotrimazole, which is an antifungal, for one week with no effect. He was then seen at the clinic and his lesions on his buttocks were scraped and tested for fungal infection. But when they did the potassium hydroxide test, it was negative. He also reports that others in his sexual network have similar issues. Huh. And us in public health and infectious disease, we like this kind of stuff because these are these are interesting cases where we're not exactly sure what's going on. So am I going to tell you what it is? I'm going to wait till the end and so think about it. Think about what might be going on here as we talk about STIs, primarily committed gonorrhea, and mycoplasma genitalia were otherwise known as Mgen. As Beth has alluded to, this has been accredited, and you can get CMA credits for it. I have no disclosures or conflicts of interest. I do want to acknowledge that a lot of this content was adopted from the University of Washington STD Prevention Training Center, CDC and their STI treatment guidelines. And finally, I want to say as with all the webinars, if I do express opinions, they're mine alone and don't necessarily represent that of the MDH or the Minnesota Medical Association. So with that.

Real quick, the agenda we're going to go over the epi regarding these STI's, chlamydia gonorrhea, and then we're going to talk about Microplasm genitalium, and then we're going to go back to those mystery cases and then hopefully have some time for questions and discussion. So I lumped chlamydia and gonorrhea together, because, honestly, they're oftentimes lumped together clinically. And I think that, you know, that we have a lot of very similar risk factors and things of that nature. And so we're going to take them together from an epi perspective. But I do want to point out the differences that we are seeing with regards to each individual organism, so I'll I'll try to make it clear when we go through this.

So let's start with chlamydia and gonorrhea in Minnesota, and we're going to look at the rate for 100,000 individuals over time, for the last 10 years. And just generally, you can see that it's fairly flat, although from about 2020 to 2024, we are seeing generally, and I don't want to get too excited, but it does appear to be trending in a downward slope, which is good. We like that. We like it. It's much better than going up like we saw with syphilis. This is actually trending down a little bit. However, that being said, in 2024 we saw a total of 26,834 cases of chlamydia and gonorrhea reported to MDH. And there's the 2024 data. 19,703 cases of chlamydia with a rate of 344.6 per 100,000, and then 7,131 cases of gonorrhea with a rate of 124.7 per 100,000. And you can see, the gonorrhea is the green line. Lowering the graph in the chlamydia set up top there.

So let's look at where folks are, where they're being diagnosed, right? So chlamydia and gonorrhea by residents at the time of diagnosis for 2024, and you can on the left hand side of the screen, you can see the number of chlamydia cases being 19,703 and 31% were identified in greater Minnesota, that's outside the metro Minneapolis St. Paul and suburban regions. Another 34% of chlamydia cases were diagnosed in the suburban areas. I will contrast this with the number of gonococcal cases that are being identified, where Minneapolis is the greatest sort of proportionate 37% and then suburban is 30% up. You can see there's less in greater Minnesota than there is for the number of chlamydia cases and why that is, I'll be honest, I'm not exactly sure. I have some hypothesis but unsure why there's that difference.

All right, now let's look at who, from an age perspective, is being infected. So here's age specific chlamydia rates by gender in Minnesota for the year of 2024. See these giant green bars sorted toward the left of the graph. Those are females. Those are young females, right? 15 to 19 to 24. And the rates of chlamydia are highest among females. And if there's a point I can make regarding chlamydia, it's this. Chlamydia rates are highest in young women. OK, females 20 to 24 continue to have the highest rate. Their rate is 2,462 cases per 100,000 females, right? Males continue to have 20 to 24 have the highest rate among age groups, but their rate is like half. It's like 1,100 per 1000,000. So again, the critical thing is females age 20 to 24 and also you can see that 15 to 19 is not far behind. These individuals have the highest rates young females. Think chlamydia.

Let's look at age specific gonorrhea rates by gender. So chlamydia and young females. Young females also are disproportionately impacted with gonorrhea, and then along with older males, and so you can see here like 25 to about you know 49. But really that 25 to 39 age range in males and then again the 15 to 24 year old range in females have the highest rates of gonorrhea. And 20- to 24-year-old males as well, obviously. But you can see here, females have the highest rate of both genders at 427 per 100,000 in that 20- to 24-year-old age group. And then males continue to record the highest rate among age groups older than 25. So young women impacted by chlamydia and gonorrhea, and then we're seeing it more gonorrhea, elevated rates in men of, you know, 25 and over, but 20 as well.

So let's look at race, ethnicity over time. And here we can see chlamydia by race, ethnicity and it's broken down into 2015 on the left, 2024, the most recent, on the right. And unsurprisingly, we are seeing disproportionate impact upon certain racial and ethnic populations that have historically been disadvantaged. And in 2024 you can see here the rate per 100,000 people in Black, non-Hispanic individuals is significantly higher than other groups, is at 1,437 cases in black, non-Hispanic. American Indians as well at 948 and then Hispanics at 842. Chlamydia rates impact traditionally disadvantaged populations more than other folks, and we've seen this continually over the past 10 years.

Gonorrhea is no different. Same story, Black, non-Hispanic individuals are most impacted, with gonorrhea at 705 cases per 100,000 people, followed closely by American Indian and then Hispanics are still significantly higher than white, non-Hispanics at 181. It's a recurring theme among all of the talks, whether it be syphilis, HIV or chlamydia, gonorrhea and other things, is that we're seeing disproportionate impacts among historically disadvantaged populations – Blacks, American Indians, and individuals who identify as Hispanic. So I talked a little about the impact that we're seeing on young women, both chlamydia and gonorrhea. And I want to delve into it a little bit more and we're so let's focus only on chlamydia and gonorrhea for those individuals aged 15 to 24 years of age.

And so let's look at Chlamydia. And first off, 15- to 24-year-olds only make up 13% of Minnesota's population. OK. And so while it may seem like they're everywhere, when you go out on the streets, there are only 13%, much larger portion of us, are people of 45 plus years. I mean, we're a lot of it. However, they make up 58% of all chlamydia cases reported. Again, one of my takeaways is that – Chlamydia, think 15- to 24-year-old females. These are incredibly high-risk individuals. Let's look at gonorrhea and it's the same sort of story, 15 to 24 makes 13%

of the population, but they come for 35% of all gonorrhea cases reported, right. This is the takeaway, right?

So now let's look at the residents of adolescents and young adults with either chlamydia or gonorrhea in Minnesota in 2024. And I want to point out that a lot of the cases we're seeing are in greater Minnesota outside the metro region, either Greater Minnesota or also the suburban regions. You can see those are the two greatest pieces of pie in our little pie chart here. And so we're thinking, chlamydia, gonorrhea, we're thinking young, both females and then with gonorrhea, females and males. And then we're thinking Greater Minnesota and suburban regions as being areas where we're seeing a lot of the cases.

So let's look at chlamydia rates and this is not going to be surprising. Chlamydia rates among adolescents and young adults by race in 2024. And the females are the green bars and the males are the blue bars and you can see here the rates for Black, non-Hispanic are incredibly high. And to the far left is white, non-Hispanic. And so that's sort of like you can use that as a comparative baseline, but Black, non-Hispanic, American Indian, and individuals who identify as Hispanic and the numbers are striking for especially for females in chlamydia. It's incredibly high for males as well, but boy, those female rates are high and we'll get to why we'll get to that why in a second.

And then we'll look at gonorrhea among adolescents and young adults as well. Same story, although you can tell here that the difference between males and females is much closer in the Black, non-Hispanic population as well, they're both incredibly high for men and women. And then along with American Indian and then Hispanic not as much, but I would say probably two to three times higher than your white non-Hispanic populations. Point being again, is that even in young people and adolescents and young adults were seeing the same racial disproportionate impacts that we saw just in the general population. So in summary, right, females, particularly females of color, are disproportionately impacted by both chlamydia and gonorrhea infection. 68% of all chlamydia or gonorrhea cases diagnosed among adolescents and young adults were females. 68%, 2/3. 36% of all Chlamydia are gonorrhea cases diagnosed in adolescents and young adults were in the Black non-Hispanic population, right. This is a population that has to be a focus. STIs in women can have serious consequences, and we will get to that, on both their health and future reproductive ability. Untreated STI's in women, it leads to all sorts of sequelae, and I will mention this several times because it's so important to identify and treat these individuals. But it can lead to pelvic inflammatory disease, infertility and ectopic pregnancies. And then pregnant people with STI's, they're at risk of passing them on to the newborn and they can result in premature delivery, infant pneumonia, blindness, other sequelae, very similar to like the impact that congenital syphilis has. These other STIs can also be passed from mother to infant and this whole thing all of these cases underscore the importance of annual preventive and prenatal screening.

So with all that being said, you know hopefully I've demonstrated sort of like the numbers behind this, but let's dive a little bit deeper and let's actually take a look at chlamydia from more of a clinical perspective. So Chlamydia trachomatis is a gram negative obligate intracellular bacterium. There's 18 different serovars right there, labeled A through C, D through K, which is what we're most concerned about, and then L1 through L3 and we'll get to

those. It affects mucosal epithelial cells, including those of the urogenital tract and conjunctiva, right. Here's the kicker. Oftentimes there are either no or minimal clinical signs and symptoms. That's a huge one. Because if you don't have signs or symptoms, you're not going in to get treated and then subsequently you can continue to pass it on. Chronic inflammatory responses in those individuals that are infected can lead to serious reproductive sequelae in women.

As we mentioned previously, chlamydia is the most common notifiable STI in the United States, and in Minnesota, it's all over the place. Everyone here I'm sure has seen it clinically. Rates remain highest among adolescents in young adults. And here's the other point – reinfection is incredibly common. We see a strong proportion of individuals who come in with multiple infections. OK, reinfection. That's a key.

Signs and symptoms. Chlamydia is a classical cause of endocervicitis in women. You know where the endometrium is, mucopurulent and friable. The cervical signs, you know that, tenderness is only present in about 10 to 20% of patients. And then in about 25% of cases, the endometrium has no signs. And so, it's called the silent infection. Now of course, you can be infected at other sites, and it can cause urethritis or salpingitis, proctitis, perihepatitis when it involves your liver. Or obviously, if you have eye involvement, it can cause conjunctivis and then again sequela. It's all about that long term sequelae, right? And infertility, pelvic inflammatory disease. Chronic pelvic pain. All bad, OK.

Let's talk about symptoms in men. Chlamydia is a classic cause of ulthritis in men, which is that, you know, sort of like, you know, burning penile discharge, burning pain on urination. Approximately 10 to 25% of the cases will present like this. You can also get epididymitis which is about 1% in untreated infection. You can get prostateitis and proctitis. You know it can cause inflammation pretty much anywhere it is. But here's the point. Asymptomatic or unrecognized infection is incredibly common in men. Which is bad because then they can pass it to other people. So remember that asymptomatic and it happens in women as well, 25% probably. But in men, we're looking greater than 50% with asymptomatic or unrecognized infection. And then of course, the sequelae of untreated chlamydia. You can have reactive arthritis which is this urethritis conjunct type of arthritis. It's most common in men under the age of 40. So the point is that is that it's hard to treat somebody if there's no clinical signs and symptoms, then they don't go in. We'll get to how we're going to fix that.

So let's talk a little bit about lymphogranuloma Veneriam or LGV. This is chlamydia that's caused by one of the L1 through L3 serovars. So, we mentioned it had 18 different 0 bars. This is L1 through L3. This is a pretty classic presentation where you have these self-resolving genital ulcers and then you have these sort of like this lymph adenopathy these buboes which is like usually along the inguinal or ephemeral region. They're tender. They're unilateral and they kind of like are like pus or separative. My understanding is that they're pretty painful. You can have Procter colitis common. You can have rectal bleeding, tenderness, constipation, mucosal inflammation. When it presents like that, especially when you have these sort of, like unilateral buboes, think chlamydia by L1 L3 or lymphogranuloma venereum and stuff. Very classic.

Let's talk about transmission. The neonatal chlamydia infections and stuff, so you can get chlamydia in the neonate after exposure to an infected cervix. This is sort of a classic case where you have the ophthalmia neonatorum and it happens about 5 to 12 days after birth. You

get this conjunctivis right. It can also infect the respiratory tract and other sites, resulting in pneumonia pharyngitis rhinitis. Pretty horrible. And then, of course, prenatal screening and treatment of the mother is the best way to prevent this neonatal infection. That's chlamydia.

Let's talk a little bit about gonorrhea. A lot of this I don't think this is incredibly new information, but it's just good to have an overview. So when we get to like the sort of like screening prevention stuff, we can, we can kind of tie it together. So let's talk about Neisseria gonorrheae. It's a gram negative diplococcus transmission through vaginal, anal and oral sex and through perinatal infection. Most common in young people ages 15 to 24, but again, we saw like elevated rates in men 25 and above. Incubation period is 1 to 14 days. You can be symptomatic two to five days after exposure. Sometimes it happens fairly quickly.

Signs and symptoms. There's a pretty classic presentation, you know in men, you get this urethritis and epididymitis symptomatic painful burning urination. You get this yellow or greenish penile discharge. Swollen. It's my understanding is that it's really uncomfortable. And there's a picture of the discharge that can come. In men, infection is usually symptomatic as compared to chlamydia, which is usually asymptomatic, or the majority of time is asymptomatic. This is uncomfortable for men, right? In contrast, in women, cervical infections are usually asymptomatic, so it's almost like the flip, almost like the reverse. Men are symptomatic; women, usually asymptomatic. And this is on a population level. There's gonna be circumstances, obviously that are different. This can also result in pelvic inflammatory disease in women and peri hepatitis, otherwise known as Fitz-Hugh-Curtis syndrome. And so you can have other sites in infection too with gonorrhea. You can have anorectal gonorrhea, right? Most anorectal infections are asymptomatic and again, as compared to infections of the urethra and the urinary tract, that's going to be symptomatic, most antorectal infections are asymptomatic. It can result in proctitis when it does have symptoms and you can cause painful itching, rectal discharge and sort of like the other stuff.

And then you can also have pharyngeal gonorrhea. And guess what? That is also almost always asymptomatic. It can be an unknown source of transmission. We'll get to that. And so in the pharyngeal gonorrhea, there's generally lower penetration of antibiotics compared to the genes of genitals or rectum, and it is a possible source of antibiotic resistance development. Remember, pharyngeal gonorrhea? OK, now if you screen and we'll get to screening in a bit, but if you screen for pharyngeal gonorrhea and you identify pharyngeal chlamydia while you're screening for pharyngeal gonorrhea, it should be treated.
And we'll get to the treatment of this. But I just wanted to make a note of that because often times if we do screening for pharyngeal gonorrhea and we pick up pharyngeal chlamydia, we should probably treat it. This is despite the fact that we're not exactly sure of the clinical significance of pharyngeal chlamydia. But we'll get more in depth into that as well. But just as a side note. When you find it, you treat it.

Let's talk about ocular gonorrhea. So neonates can not only get ophthalmia neonatorum from chlamydia, they can also get it from gonorrhea. As we mention neonatal conjunctivitis and there it is right there. This occurs very similar to chlamydia, where you have the infection of the neonate during vaginal delivery of an infected mother. And again, prevention is through maternal screening and treatment and then ocular prophylaxis with erythromycin.

All right, now, adult gonococcal conjunctivitis. And this actually happens, I think more than people realize. You need systemic therapy. And again, we'll get into treatment a little bit later on, but this is systemic therapy. This is not just topicals. They need to get intramuscular subtracts on a dose of that. Now gonorrhea untreated can also disseminate to distant sites, right? And so disseminated gonococcal infection, or DGI. Let's talk really briefly about that. So about half the 3% of untreated infections with gonorrhea results in disseminated gonococcal infection, right? There are certain strains of gonorrhea that result in DGI and can cause an asymptomatic initial infection. So in other words, you don't even know you have it. And then all of a sudden you have disseminated infection. DGI usually manifest usually as petechial or pustular acral skin lesions. So on the extremities there. And here's a picture of one with an arrow. You can see that sort of like that particular achral skin lesion. You get this asymptomatic polyarthralgia, you know, you get like, oh, my left knee is bothering me, right? Has for a while and so it's just sort of like this asymmetric or you get a tendency to septic arthritis. And then rarely, not never, but rarely, DGI is complicated by perihepatitis, endocarditis, or meningitis. It can go to your brain, your heart, wherever. So now why am I talking about this? I'll get to it, but if you suspect disseminated gonococcal infection, you need to get NAAT and culture from all exposed sites. And so that's all urogenital and extra genital sites, and from the disseminated sites of infection. So go ahead and tap that joint and get that. All the isolates should be tested for antimicrobial susceptibility, and this is hospitalization and consultation with ID. You know, we mentioned that before in certain cases of, you know, HIV infection or complicated syphilis. This is also ID consultation and then the bottom line is that disseminated gonococcular infection is generally uncommon. And I'm putting generally because I got some for you here. And it's serious and I say generally uncommon. However, check this out. In 2024, we saw an incredible increase in the amount of disseminated gonococcal infection in Minnesota. And you can see here over time 2020 to 2024, every year we would bounce around between 4 and 8 cases of disseminated gynnococcal gonorrhea reported to us per year and in 2024. All of a sudden, it spikes up and we saw 27 cases. OK, this is all happening during this sort of slow decline of the number of just non disseminated cases were reported. So, you can see this green line here it, you know, gonorrhea in general is going down. But why the spike in 2024 disseminated cases? And here's a little hint, 2025 is similar. And so what is going on? And so let's look at a little bit at DGI in Minnesota in 2024.

As I said before, we had 27 cases. That's more than we had in the previous four years combined. We only had 26 from 2020 to 2023 and 27 in 24, and there's more than that in 2025. There were no epi links detected among the 27 cases, so it's not like they were sexual partners or they lived, you know, together or they went to the same like venue or or any of this kind of stuff. Couldn't figure out any pattern between this. What we did know is that the greater proportions were male. A lot of them were MSM and they were concentrated in one metropolitan county, but that doesn't really help us a whole lot, to be honest with you now. We did do whole genome sequencing on all of these organisms. Well as many as we could get and we identified that the isolates identified a very distinct strain, the strain that was labeled ST11184, right? And they were all the same strain. And then sixteen of those isolates, including every single one that was that distinct ST11184 strain they all encoded this porin, called porB1a, right? And that's a membrane structure. So it sits on the outside of the bacterium and it has

been associated with disseminated disease. But what's going on? The investigation's ongoing, so you might hear more about this as we move forward and we we understand a little bit more, but super interesting so think gonorrhea. Think disseminated gonorrhea.

Let's get to meet the heart of the order here. Like, how do we stop or prevent all this stuff? Let's talk about screening, testing and treatment. OK, in women … chlamydia and gonorrhea, screening recommendations. And because there's such high incidence of chlamydia, gonorrhea, and a high proportion of asymptomatic infections, this is why we say all sexually active women under the age of 25 get annually screened for chlamydia and gonorrhea, including those who are pregnant. All of them, everybody. Screen sexually active women over or equal the age of 25 annually of increased risk, including those who are pregnant. And I'm going to tell you increased risk. You got to work real hard, in my estimation, not to be at increased risk because, per US PSTF down here. You're at increased risk if you: have a new sexual partner, more than one sexual partner, a sex partner that has other partners, a sex partner who has an STI, inconsistent condom use. If you have a previous or coexisting STI and then of course if you've ever exchanged sex for money or drugs, have a history of incarceration, all that kind of stuff. But you, you know, you got to meet a pretty high bar not to be considered an increased risk.
My point, I guess, is when in doubt screen and it goes back to what I said. For those of you who are like last week taking a sexual history. And understanding an individual's risk factors – that is so critical to truly understanding whether or not individuals should be screened in sort of like, these folks that are at increased risk. When in doubt, if you have any clinical suspicion, if you're unsure, I would recommend screening. Then again, I'm stepping outside the recommendations, but just in a practical sense. OK, if you are pregnant, you need to retest during the third trimester. Again, if you're under 25 or if you're 25 or older at increased risk. That's to catch those individuals who are infected during pregnancy, right? Now, if you were pregnant and diagnosed with chlamydia, if you were pregnant, you need to perform a test of cure at four weeks after treatment. Only if pregnant. Test to cure not for individuals who are not pregnant, but if you're pregnant, you need to make sure that that chlamydia has been treated.
For all women diagnosed with an infection, you need to retest them three months after treatment, and that is due to this high number of re infections that we're seeing. We're going to get to how to deal with that. But retest all women diagnosed with infection three months after treatment.

OK, now pharyngeal and rectal gonorrhea, along with rectal chlamydia, testing should be considered using shared clinical decision making after discussion of sexual behaviors and exposures. That goes back to that whole, are you able to comprehend and appropriate sexual history? So important, because if you don't know extra genital sites of exposure and the risk you might not screen and you might miss it so. That's women. The big take away is screen for chlamydia and gonorrhea.

Chlamydia and gonorrhea in men again, high incidence of chlamydia and gonorrhea and a lot of asymptomatic infections. For men who have sex with women, there is insufficient evidence for universal chlamydia screening. However, you can consider it in high prevalence clinical settings such as adolescent clinics, correctional facilities, STI sexual health clinics. And obviously, if people are presenting with symptoms or they have risk or exposure or they request it, I will go ahead and screen. But no universal screen recommendation. For men who have sex with men,

screening should be performed at least annually for sexually active MSM at all sites of contact, and I'm going to emphasize that multiple times. All sites of contract, urethra and rectum for both chlamydia and gonorrhea, and pharyngeal for gonorrhea. Irrespective of condom use, right? All sites. For MSM at increased risk, and so those are folks that are on PrEP, those with HIV infections, or if their sex partner has multiple partners, they should be screened every three to six months at all sites of contact. Chlamydia and gonorrhea at the urethra and rectum and then pharyngeal for gonorrhea.

So here it is. Everything I just said, but in a really nice brief table form. And again I think the slides are going to be available after all this, and so you can just it kind of lays it out right here. That's why I won't go over it. I just went through it.

So let's talk a little bit about diagnostic testing. And so here I put the little talks about all of this stuff. NAATs are awesome. Urine NAATs, I think are great. And so they're recommended for both males and females. The optimal specimens in males is the first catch urine, and then vaginal swabs in females – the net sensitivities are really good. Vaginal swabs are better than cervical swabs, which is better than urine and self-collected or patient collected. Vaginal swabs have very high sensitivities as well, and so you can consider that if that would be the patient preference. Nat, these nucleic acid amplification tests are also optimal for both rectal and pharyngeal testing. They're great right now, specific for gonorrhea. So we have an individual coming in and and they have sort of that that purulent discharge from your urethra. You can do a Gram stain, right? It's real sensitive and specific. When you look at it, if you don't want to do a NAAT, you don't have that capability. But unfortunately, Gram stain is not sensitive or specific enough for endoservical, vaginal, rectal or pharyngeal. And so it's very, very specific to that one circumstance. Culture is great because you can use any body fluid, and it allows for antimicrobial sensitivity testing. That's key because you can't do that with a NAAT. And so if you have concern that there may be resistance in this organism, you have to do a culture right and then checking urine alone. Only doing the urine NAATs is insufficient for MSM populations. And I would also argue for other individuals, depending on the risk, risk factors and size of exposure. And then again as I as I mentioned before, you can't do resistance testing on NAATs. You have to have a culture.

As a side note, I went to a presentation on this and I didn't invent this. I stole this actually from the University of Washington STD Prevention Center: If you only screen the P, you'll miss the CT/GC and I made the mistake of typing this and saying it out loud in the presence of my 8 year old son who thought it was the funniest thing he's ever heard. And so now I'm hoping I enforced that upon him, we said don't repeat this in his class, but he runs around the house going if you only screen the P, you'll miss CT/GC anyway. But I think it's a good little thing to keep in the back of your mind. It usually refers to rectal and oropharynx screening, right? And so you can have mucopyulin discharge from the rectum. You can see it here in the oropharynx and among men who have sex with men. We have pretty high rates of extra genital infection, and they estimate between 9 and 12% of all infections. Based upon whether it's the pharynx or rectal and the majority of extra genital infections are asymptomatic, that's awful, right? They estimate 92% of pharyngeal gonorrhea and 82 to 84% of rectal gonorrhea are asymptomatic. You can't treat what you don't know, right? So now this recommendation for this extra general screening was routinely recommended for MSM. But now we're saying go ahead for other

individuals, including women, based upon reported sexual behaviors and exposures. That's that sexual history that keeps coming up. We have to do that. This is interesting, and I'm going to take a pause. 30% of symptomatic gonococcal urethritis right is attributable, they estimate, to oropharyngeal exposure. If we don't look, we're not going to find it. We can't find it. We can't treat it.

The other things too is that treatment, depending on sites differ, right? For pharyngeal gonorrhea, you're going to want to use ceftriaxone more than you are cefixime. And for rectal chlamydia, Doxy absolutely more than azithromycin, except in pregnancy. So, and I mentioned before, we're not sure what the clinical significance of pharyngeal chlamydia, but if you do identify it when you're looking for gonorrhea, go ahead and treat it with seven days of doxy. We'll get to that.

Let's talk about treatment. I'm sure you all know this. You've probably all done this. Chlamydia infection, cervix, urethra, rectum. It's doxy. I love doxycycline. Doxycycline twice a day for seven days, right? You can use azithromycin times one or the levofloxacin times 7. However, doxy is more effective based upon studies, and there's a lot of sort of like unidentified rectal chlamydia in women that may not be associated with sexual transmission there or unknown. We're not sure how that that site was infected, but doxy is way more effective for that. And so per the data we have right now and so that’s why we recommend doxy over azithromycin. Of course, if the individual's pregnant, we don't use doxy. Use that azithromycin or you can also do amox for seven days. Remember test of cure is not advised for non-pregnant persons that got sort of like the recommended treatment unless we're questioning adherence, or they have persistent symptoms or reinfection is suspected. Remember, after three months you just test them again. Except just to make sure, because of high rates of reinfection and that kind of thing. So if you're pregnant, they do a test cure for four weeks, but not if you're not pregnant.

So let's talk about gonorrhea treatments for uncomplicated gonorrhea of cervix, urethra, or rectum, it's ceftriaxone times one. And then you give them 500 milligrams if you're under a 150 kilograms or 1g for those 150 kilograms. And over if you have an excluded chlamydia infection. Go ahead and treat them with seven days of doxy There are alternatives for those individuals. You can do gent, intramuscular plus azithromycin or you can cefixime 800 milligrams. If you have uncomplicated pharyngeal gonorrhea, it's ceftriaxone. There's no alternatives, right? Ceftriaxone for uncomplicated pharyngeal right. And then testicular, for pharyngeal gonorrhea 7 to 14 days after the treatment, and that can be done by culture or Nat, right? And seven days. That's pretty soon, I would wait a little bit if you can. 10 to 14 days just to make sure that you're clear.

So now let's talk about, this is important, expedited partner therapy. Reinfection is incredibly common, and if you don't treat sexual partners, you're going to, obviously, you're going to increase your risk for re infection. EPT is critical to stop reinfection. We have to treat people and before I go into all of this, I will say it would be even better if we could bring them in and actually have a discussion with them about their sexual behaviors, right? Bring them in. Talk to them because it may be that they're at risk for other things as well, and so we can talk about EPT, but the ideal is to have a relationship and develop one with this with this partner.

EPT is allowed in Minnesota and all the other states by law and statute. It is appropriate for partners of patients with gonorrhea or chlamydia, whose treatment cannot be insured or is unlikely. And so if they're not willing to come in. If they, you know, maybe they don't want to admit or not admit they don't want to disclose who their partners are. All that kind of stuff – we can use EPT. It is not appropriate for syphilis. We need to see folks in testing for syphilis and you can go back 60 days and treat the partners for the last 60 days no matter how many there are. It was previously recommended for only women who have sex with men and men who have sex with women. And that was due to other risks for MSM individuals, they wanted to come in and make sure you know that they didn't have undiagnosed HIV, undiagnosed syphilis, other issues. But now it's recommended through a shared decision-making process for men who have sex with men as well. And as I said in the beginning, I'd much rather have these people come in. But if that can't be done or there's other factors that are contributing to that, then go ahead and utilize EPT. It's critical. And then this is just basically providing patients with packaged oral medications to take with them.

You have the patient, you treat them but also give them medications that they can take to their partners or write them dummy scripts that they can fill, and it can be like John Smith or EPT patient. You know that kind of thing and write EPT on it with the with the drug and you go ahead and give the dummy script to the patient to hand out so. So here's our EPT recommendations, right.

And you can see here that if they have exposure to gonorrhea and chlamydia, they're going to go ahead and get cefixime 800 milligrams and doxycycline for seven days. And then if they only have gonorrhea, it's just a cefixime. I mean, if only chlamydia, it's the doxycycline.
Again, I will emphasize that partners should be encouraged to present for testing and treatment. It's an opportunity, right? I love opportunities. Give them an opportunity to come in and talk about how they can best navigate a healthy sexual relationship. And then again, there's concern for other unidentified STI, like HIV, syphilis. You can counsel about doxycycline, including don't give it to individuals who are or may become pregnant. And then of course, other potential side effects, including photosensitivity, GI symptoms, etc. And then advise on complications or where to seek care. Maybe your clinic or your site is not convenient. There are other places that people can go, or maybe where they feel more comfortable. So there's always that as well.

So key takeaways. Females, particularly BIPOC communities, are disproportionately impacted by chlamydia and gonorrhea. It's just young females and historically disadvantaged populations are completely disproportionately impacted. We have to ensure adequate screening for both chlamydia and gonorrhea and syphilis and HIV. You know when they talk about risk factors for those females 25 and over from my personal opinion, I have a fairly low threshold or low bar to test right to screen. Don't forget throat and rectum in MSM and other folks as well, based upon that sexual history discussion that we have risk factors, exposures and stuff. If you only test the P, you're going miss GC/CT, right? Keep that in your mind.

NAATs are great. They're superior to culture for both CT and GC, and you have to treat the partners. They estimate the 30 to 70% of partners are infected with gonorrhea and chlamydia. And so, if you don't test them, ongoing transmission is going to happen. People are going to

continue to get infected and again, we don't want people infected because it can lead to all those long-term sequelae, especially in women. EPT can be used for heterosexual individuals and gonorrhea and chlamydia, but also consider for individuals who identify as MSM. We'd love to have them come in and talk to them and test them for HIV and syphilis and other things, but we can also have a discussion about them about this as well. Retest in three months for individuals who are diagnosed with chlamydia and gonorrhea. Due to the high rates of reinfection, and again, they estimate 7 to 12% will be re infected within one year, and pharyngeal gonorrhea needs a test to cure in seven to 14 days after treatment. I would move out to 14 days.

We got 12 minutes left and I haven't even done the mystery cases yet. Let's talk about Mycoplasma genitalium one. I think that gets ignored and I and I think that people are starting to recognize that it's a little more common than people realize. So Mycoplasma genitalium is a bacterial sexually transmitted infection identified first in 1981. And they estimate the prevalence in the general population between about .7 and 3.3%. But it's definitely going to be higher in some high-risk groups. I'm just going to say Mgen is the etiology of about 15 to 20% of non-gonococcal urethritis and about 40% of persistent or recurrent urethritis. Right, that's a lot. I mean, you know, you go in, you got this, your arthritis, your test, negative gonorrhea. Well, you know, you treat them anyway. But think about mycoplasm genitalium. In women, Mgen is identified in about 10 to 30% of those with Cervicitis, when you test for it and the data is supportive of a causal relationship. In other words, the M Gen. is actually causing the cervicitis. It's not just there as a, you know, as a commensal organism or something. Think M Gen. It can be asymptomatic, right? But men are going to have that dysuria or burning sensation when they urinate. Either have that or discharge from the penis, that urethritis. Women are going have abnormal vaginal discharge. But again, it can be asymptomatic. It's transmitted through vaginal or anal sex. There's not a lot of data right now about whether or not it can be transmitted through oral sex, but definitely vaginal or anal. And then infected people can transmit infection even if asymptomatic. And that's obviously a big kicker.

What are we going to do with that? Let's talk about testing, right. It is a slow growing organism. Takes like six months to grow a culture. So there's lots of NAATs use. Best use in that there's multiple FDA approved NAATs to use and you can have sites that include urine and urethral swabs, medial swabs, endoservical, and vaginal swab samples. And so, depending on the NAAT that you have at your clinic or site, go ahead and check to see which specimen is good. Who should be tested? Men with recurrent non gonococcal urethritis, women with recurrent cervicitis. Maybe you treated them and things aren't getting better. Think about mgen. And then consider testing in women with pelvic inflammatory disease. Is that what's causing this? This sort of prolonged inflammatory response. Testing should be accompanied with resistance testing, if available. So, and that's not common to be able to have resistance testing done. And so if it's available, you have to do resistance testing. But if it's not, there's a way around that and I'll tell you that. And then the big thing is screening for asymptomatic mgem infection among women and men. Extragenital testing for M genitalium is not recommended. Don't screen asymptomatic folks and don't test extragenital sites.

So, let's talk about treatment. Let's say you you get a positive M Gen. There are incredibly high rates of macrolide resistance. So don't use a single 1G dose of azithromycin. Don't do that, OK?

It's a two staged therapy. Ideally, if you can get resistance testing, that's what we want, right? And that's what's recommended if you if there's a two-stage therapy, it's a cure rate of greater than 90%. This has to be used. You have the first stage, is doxycycline, which reduces the overall burden of the organism. And then you follow it with either azathromyosin for susceptible organisms or moxifloxacin for resistant organisms. And then there's no test to cure recommended. So here's your treatment in a little table, and again, if you have resistance testing and it's macrolide sensitive, it's seven days of doxy followed by a single oral dose of azathromycin and then three more 500 milligram doses daily for three days of azathromycin, right? So that's two stage approach. If it's resistant, you still do the doxy for seven days, but then you do seven days of moxifloxacin. And then if you don't have resistance testing available, it's that doxycycline plus moxifloxacin regimen. So, remember that mgen requires A2 stage treatment. Now, if you suspect treatment failure, call ID right. That's the summary. If you really think you have a resistant or treatment failure, then please call your ID or call us here at MDH. But here's some regiments you could try.

Remember the mystery cases one and two I gave you. I gave you the 30-year old MSM individuals with these erythemas discreet placie type lesions. They tested negative on KOH. They presumptively treated rectal gonorrhea in one, and they presumably treated for both for syphilis. But here's what I want to show you. I want to give you pictures. So, here's the pictures for you ready. Those are pictures of the lesions on the buttocks. There's some in the abdomen and you can see they're discrete, right? And they're erythematous. And they are scaly, placiel looking things, right? Here's a little bit around, sort of like the upper lip area, maybe a few on the chin there. Specimens were collected from the lesions and they were sent for culture. So forget the KOH. They're culture and the cultures were positive for trichophyton mentagrophytes is or TMVII. I want to talk about this in the last five minutes because this is coming right? This is an emerging fungal infection, often transmitted through sexual contact. It's closely related to trichophyton indotineae, which is a highly resistant organism. It used to be called trichophyton Mantagraphides 8 but they just gave it its own name now. So this is anyway TMVII. It's highly infectious. You could remember those cases they said they had multiple other people in their sexual networks that had similar things. Now the first case that was diagnosed in the United States was in 2024 and that was in New York City. And it's been previously identified in patient populations such as men who have sex with men. And there's outbreaks that happen in Europe prior to 2024 and then individuals who travel to Southeast Asia for sex tourism. It causes these itchy, scaly lesions on the anywhere there's skin to skin contact. Right trunk, groin, genitals, face. It requires, not topical, prolonged oral antifungal therapy. We're thinking like three months of oral Lamisil. Here's the thing. We're seeing cases now in Minnesota. If someone is suspected to be infected with TMVII, you need to do that that potassium hydroxide test. But even if it's negative, you need to send it for culture and you need to call us. Please, we need to do advanced molecular methods in conjunction with outside labs and CDC. So please, if you suspect a case, reach out to us. You can call us. You can. We're developing online case reporting forum. This is something that you'll be seeing. Council individuals that transmission to others as possible, at least as long as lesions are present. Patients with suspect TMZ should be screened for other STI's and partner notification screening should be discussed. Patients need to avoid sharing personal items and clothing, and right now we have 5. I just found out we have

5 confirmed cases in Minnesota and we have several more that are concerning for infection. So please, if you see cases that are like this, please reach out to us. I'm happy to discuss with you or one of the team members. More to come on that. And so in summary, I think that's it actually, so happy to happy to answer any questions or comments that you might have in the last couple of minutes. Thanks.

And if you're able to unmute yourself and just go ahead, just feel free. I don't have access to chat, so I'm not sure who's in charge of that, but feel free to just unmute yourself and just ask a question if you happen to have one. So happy to have it answered.

Thanks so much, Nick. I have pulled up the Q&A. I'm not seeing anything in it. So yeah, definitely opening it up though to folks, if you have something you just want to ask Nick directly, please go ahead. OK I am seeing this. Maybe it's coming into the chat. There's a question, Nick, about any concerns about resistance developing from doxypep use.

That is a that is an ongoing thing right now regarding doxypep. And right now I don't think there's any definitive conclusions. You know, it's a it's a complex sort of thing. So no, I mean, there's always a concern, right? Anytime individuals take antibiotics, there's always a concern for selection of resistant bacteria, especially when it's sort of like we're unsure as to what they're exposed to or their burden or all that kind of stuff. I don't have a great definitive answer for you. Data will be coming out. There's no question there are ongoing studies looking at this. And so, so more to come. On that. But yes, that's a great question. I wish I had better response for you, but I think the concern is there and that's why there's people looking at it. But we'll have to. Let's see. And the other thing is that it kind of depends too because is it a high user where individuals are receiving, you know I think there was one study that looked at individuals who were using it more than or three to six times per month, or less than three times, and they were looking at like a selection of resistance and this sort of thing. I think it depends on a lot of different factors as well. And to be able to tease all that out, I think we're going have to wait a little bit to kind of just really to know that I know that's not a very satisfying answer. But it's being looked at.

That's great, Nick. And I kind of have seen similar things that it's being looked at, but I don't know that we know. Another question is, do you think there's anything about like screening bias in terms of you know why we might be seeing some of the disparities and positive tests for gonorrhea and chlamydia? Like, are we under screening potentially white young people? And I've also had people, you know, even just ask that question with relation to like. Why do we maybe see higher rates in females versus men? Do you think that there's any anything to do with, like screening bias at all? That helps explain some of these differences in rates?

Yeah. You know, personally, yes, I do. I'll be blunt. I do think they're screening bias.
Do I have any data to support that? No, I don't. And because I think we can try and I think we do our best to try to be as objective as possible when it comes to the recommendations and having that thing. But I also think that oftentimes it's difficult to truly have enough of a trusting relationship with every single person that we have in order to really determine whether or not that they meet the requirements for recommended screenings. And so it may be that your own personal biases may unfortunately and unconsciously come in, and you'd be like, Oh yeah, I can just see that they're at low risk. Or they report that they're in a monogamous relationship and I

don't see any reason to discuss it further. And so I think that unintentionally, I think that does happen. Now, how much of it does it explain? That's hard to say. You know what I mean? I also think that a lot of like trust, access to care, you know, other barriers are also present as well. But the short answer is I do. I do think there is. I do think that bias does impact the rates. To what extent I don't know though.

Great. I know we're just slightly over. These are great questions. I think we maybe have time for one more if people are still on. And I am trying to take note of these and I think as we mentioned, we will post the Q&A. Yeah, just opening it up for maybe one last question otherwise. Not seeing anything in the chat. Thank you, Mary for posting the evaluation link. Oh, do we have r naughts for these infections? Back one last question in the chat.

Oh, Beth, you might be able to answer that more than I can, actually. I'm not sure.
I'd have to look and I it is a good question.

I'm not sure either. It's a good question, though, yeah.

I can certainly look into it and then and then in Q&A when we respond to all the questions. I think that's something that we could absolutely put in there, so.

Yeah, agreed I was thinking that's a really good question. I wonder if Nick knows.

It is, yeah. No, it is a good question. I was like, I think I thought about it. I just don't think I have the answer so but we can find it. Yep.

Right. Yeah, good question. OK. Well, thank you everyone for joining us today and. Oh yeah, just seeing the follow up of just curious, but never really hears anybody reporting on them. So yeah, we'll have to look into that and put it in the Q&A document that we create. But yeah, please. You know, if you have a second right now to complete that evaluation link. Otherwise we will also send it out to you. But thank you so much for joining us and thank you, Nick, for a wonderful job on all of these. It's just I always learn something when you when you present so. Thanks everybody. Hope you all have a good rest of your day.

Hope you all have a good rest of your day.