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9TH ANNUAL NYS SEXUAL HEALTH CONFERENCE: EMERGING ISSUES AND PRACTICE UPDATES - DAY 2

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[video transcript]

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Dr. Plotnick joined the faculty at the University of Rochester Medical Center in 1991 as an assistant professor and also serves as the Associate Medical Director of the Rochester AI and human parts bank, here in highest distinctions at the University of Michigan, where he received his Bachelor of Science and Medical Degree. After completing an ophthalmology residency and serving as chief resident at the University of Wisconsin Madison. He received further training through a cornea and external disease fellowship at the University of California Davis. Welcome Dr. Plotnick.

00:41
Thank you, Jessica, for that introduction, much appreciated. And thank you and your team and Dr. Reuben for inviting me to speak today on the evaluation and management of sexual transmitted diseases involving the eye. Our learning objectives are to identify sexually transmitted infections that can affect the eye and describe their corresponding clinical manifestations and describe recommended evaluation of selected ocular STIs. And discuss recommended treatment as well. We'll talk today about syphilis, gonorrhea and chlamydia. We'll start with syphilis. Syphilis, as you all know, I'm sure is due to the bacteria treponema pallidum, it's spiral shaped it's gram negative and highly modal. It's humans are the only natural host, there's almost no foam widespread. Sexual acquired infection is by direct contact 30 to 6% exposed to primary secondary syphilis will actually acquire it and revive compromised skin but also through intact mucous membranes which is important travels via the circulatory system including lymphatics and has sexual and vertical transmission. There are three main stages although there are other divisions as well. I want to spend just a little bit of time on each just so we know where the ocular disease falls within primary secondary and tertiary syphilis. So primary is characterized by the formation of a chancre, which is a skin lesion which can be single or multiple, for plus or minus painless, typically not itchy, averaging three weeks after the infection at the site of inoculation. One can have enlarged lymph nodes can be on sexual organs, but can also be non gentle general, and lasts three to six weeks typically without treatment. For secondary syphilis, this is characterized by fever and malaise and general constitutional symptoms. One can have skin and mucous membrane as well involvements lymph node involvement. This usually results after three to six weeks of the lesion in this stage is called condyloma labrum, which is an infectious lesion on off on the palms and soles and extremities. Usually symmetrical red to pink and non itchy. Tertiary Syphilis is known for neurologic and cardiovascular manifestations as well as some other things. This typically occurs months to years, typically three to 15 years following infection. Without treatment, and approximately a third of infected people develop this not typically infectious but they have significant morbidity can be early or late. And these people not all but mostly need CSF examination and HIV testing. Among other testing. There are four different forms of tertiary

syphilis. The dominant syphilis, which is a soft tumor, like massive inflammation, varies in size can be in skin, but it also in bone and liver and other places in the body, like neurosyphilis, cardiovascular, syphilis and syphilis associated with psychiatric manifestations. There's also latent syphilis, which is important in ophthalmology, which I'll get to in just a little bit, but late and Syphilis is basically can persist for years. It can form from primary, secondary or tertiary syphilis. It's not transmitted sexually, and it's defined as zero reactivity without other evidence of primary, secondary or tertiary disease. These people need to be treated to prevent medical complications. And there is vertical transmission. In these in this group, there's early latent and late life and each one has characteristics but it's basically less than a year or greater than a year now neurosyphilis in general Is when Trump minima. pallidum, invades the central nervous system. It can occur at any stage, it's not necessarily, you know, progressing from one to the other, typically occurs from for 25 years after the initial infection can be early, without symptoms only seen only with findings on the CSF exam, or late with meningeal, vascular Civilis general cases or TV star Salas, which is involved in the dorsal root ganglion. And then and then ocular involvement. Symptoms at this point can be altered mental status, stroke, auditory loss of vibration sense, that's actually a sign, motor deficits, sensory deficits and symptoms of ocular inflammation is the symptoms of ocular inflammation that we're going to concentrate most on. In here's just an example on these two CTS of syphilis within the brain, and central nervous system.

06:08
For neurosyphilis, there are groups who have been recommended get a CSF exam, there are other groups where it's very mild. But basically, if clinical evidence of neural involvement is observed cognitive dysfunction, motor sensory deficits, things that were going over before, basically, a CSF exam should be performed before treatment. And there are certain findings that one can see specifically on the CSF exam, although some of those findings can be seen in those with HIV alone. And so there are false positives.

06:49
Test testing is interesting. What the university did in years past was they would just get a vdrl, a non Trump enabled test, and if that was negative, that would be the benefit and it was positive, then they would do further testing. But at least for ocular disease, the vdrl is not the main indicator for ocular activity. Having a Trump an evil test, which is a forever test is more in keeping with ocular disease that we simply that we typically see late in the disease. So for the non Trump Nemo, we have the vdrl Er PR, trust and usr. The advantage of this is that that's quantifiable, reflecting both disease activity and response to therapy, whereas the company will tell us or not, and for the company will tell us it's highly sensitive, usually reactive for life. But the titers cannot be used to assess treatment response. We now at the University unless there's been a more recent change, do this reverse sequence testing, which is what is recommended. So what we do is we first do a very sensitive treponemal test, but not as not necessarily specific. And then if that's positive, then we go into a quantitative quantitative RPR. If the RPR is positive, then one has syphilis. If it's negative, then you go and do the more specific but less sensitive Trump and evil test. And this is done for all of our patients when we send off syphilis

testing. terms in the eye, just a quick lesson on anatomy. Both of these pictures show a cutaway section of the eye. On the left, we see the cornea. And we can see the colored Iris through it, the cornea sort of the watch glass on the front of the eye. And then there is a vascular layer. And that vascular layer includes the iris, the colored part of the IVC when you look and then as you go back within that layer, you reach the tissue. In the park, it's called pars Plunet planar, and that's what produces the fluid for the eye. And then that vascular layer continues back and provides nourishment to the retina. So the retina gets nourished by the vessels inside the eye inside the retina, but also deep to the retina. And it's typically this layer, the uveal track, which gets inflamed and is the target tissue for the syphilis inflammatory changes that we see. This is just another view where we have the iris to cross section. That's why it's only sort of coming out halfway. This is the pupil where the light goes through. And then as you follow that section back, you see the parts planar and then the core right, which is that part of the UV, which nourishes the retina. And here's just another little diagram where I wanted to talk to us about the cornea, where the cornea has several levels layers. That's what you know the watch class on the surface, and you can have problems in the front, the middle or the back of the cornea and then to your right. Just to show you that's the lens being held in position by little strings, that's what holds the lens in place. And then the retina which is the purple hair lining the back of the eye, you get a little bit better view of the iris than in some of the previous diagrams. So the case definition for ocular Syphilis is a person with clinical symptoms or signs consistent with ocular disease, including UVI, which is inflammation of the UVA pan UV itis, which is inflammation of all the via the back choroid. The central parts played out in the anterior Iris, decreased vision, they can have blindness, the optic nerve can become inflamed and they can have blindness on that basis. That's called optic neuropathy. They can have interstitial keratitis, which is inflammation in the clear cornea. And then they can have inflammation in the back of the eye and the retina. And I'm going to show you examples of these as we go forward. Ensure immediate appointment exam for patients who have a diagnosis of syphilis and any ocular complaints, whether or not they are vdrl or RPR positive, so they don't have to be reactive in that way to have ocular disease. But they would obviously be have a positive troponin will test. These changes can lead to decreased visual acuity of blindness fairly quickly. And so they need to be referred. And basically, once they're referred as long as it's not too late, I mean, this is terrible. Treatment is specific and prevents further spread of infection. So, specifically, when you see these patients ask visual complaints, red eye, decreased vision, light sensitivity, missing part of the visual field. You know, these these are things that would tell us there's something going on. A little bit of right eye alone could be something else, but anything that decreases the vision in the setting of a positive diagnosis of Syphilis is an urgent or relatively urgent situation. So syphilis, ocular complaints, immediate atomic examination, HIV testing is probably a good idea. And for anyone with positive syphilis, serology and early syphilis without ocular symptoms, careful neurologic exam, there are several cranial nerves, cranial nerve 2345, and six, then seven for the facial musculature that are associated with the eye and can be problematic in terms of the symptom of a create. So neurosyphilis, as it relates to the eye, ocular syphilis should be treated similar to neurosyphilis. Others have said even more strongly where ocular Syphilis is, is in your syphilis. It's not always I think, when you have the uveal tract inflammation, that's that's your typically neural syphilis, cranial nerve dysfunction neurosyphilis isolated ocular

symptoms without cranial nerve involvement. I think it's difficult for some ophthalmologist to make this distinction. So it would be difficult for I think, for a non ophthalmologist to make this distinction. So all patients even if it's isolated, need to have an exam. And its relation to an isolated ocular symptoms without cranial nerve involvement in relation to CSF exam. It's probably unnecessary to do that before starting treatment. But again, get ophthalmology involved as early as you can. So I can syphilis cause inflammation in any part of the eye, the lids, the conjunctiva. The conjunctiva is the clear spongy layer that covers covers the white of the eye, including the back of the legs, it covers everything that you see on the eye other than the cornea. The orbit is where the globe sits. A cornea is the window. The sclera is the equivalent of the cornea, but it's covered by conjunctiva. And it's the white of the eye. The anterior chamber is the area of the eye between the cornea and the iris, which we'll all show you which is a mark which can be a marker if there's inflammation there for Iris. Then we have the iris and ciliary body, which you mentioned before as part of the uveal track. The pupil sometimes there's a pupil abnormality that can go along with syphilis. The lens is what gets cloudy with a cataract you can have inflammation associated with cataract formation. And I'll show you that optic nerve inflammation is very serious. You could have a neuritis apparent neuritis on your retina itis or abdominal within the nerve motility dysfunction. That's due to the ocular motor there and sets three four and six and then the retina and vitreous. The vitreous fills the middle of the AI, and the retina is the photoreceptor layer, which lies the back of the eye which gathers the light. So let's start with UV Iris. That was the, if you go to the picture on the upper right, we can see the iris. It's kind of those long sticks. The ciliary body, which makes the fluid further back, and then the chloride inflammation in any of those regions, is the most common form of ocular syphilis. It can be isolated to the iris, it can be just the ciliary body, it can be just the choroid. Or the worst it can be everything we call a pan UV itis.

15:46

So this is a picture of a patient and you are looking through the clear cornea. And that white there is just a light reflex. That's that's not real. And so if the cornea was cloudy, that view of the iris would be obscured. And if there's inflammation in the iris, what we see is cells floating around in the front of the eye in the space between the back of the cornea and the front of the iris. Now, if you look closely, you can see that the redness is in a ring around the cornea. And that is fairly specific for iris or inflammation of the iris, as opposed to like pink dye or something like that. So it's called ciliary flush. And that is a marker for inflammation. The other thing that they can get when the iris is inflamed is you can get these collections of white blood cells on the back of the cornea. And those are called credit precipitates. And as opposed to other causes of arthritis. These these correct credit precipitates these collections of cells in the back of the cornea, they look very, what's called granulomatous. They're thick and sludgy. And they can be as much as a millimeter across, which in i terms is kind of a lot. They can also get something called posterior sneakier, which is scarring from the iris to the lens behind it, and we'll see that in a later photo. Okay, so on the upper left, you can see where there's a lot of inflammation of the blood vessels. And that inflammation is centered very close to the cornea, it's concentrated towards the cornea. So this is a good example of that ciliary flush that we see when there's Iris inflammation. When we go to the right, again, you can see that there is inflammation in the hall

and all the white of the eye, but it's concentrated more around the edge of the core cornea. So we're looking through the cornea to see the iris, that's what's inflamed. And this redness here is associated with that inflammation. It can be both eyes, but it's typically one eye. But not always. This is an example where the inflammation and the redness is more diffuse, and without ciliary flush, but these are all examples of eye rhinitis. And on the lower right, that that circle here is just the light night for illuminating the cornea. So ignore that. But you can see that there's a ciliary flush here around the iris, which again, is a good marker for actual inflammation of the iris. These are examples of the credit precipitates or KP, which are collections of white blood cells that form on the back of the cornea. And with other types of arthritis, we see little ones like here, you know, very small or even smaller. But once you start getting big like this, oh, that's granulomatous and that's usually due to either syphilis or sarcoid. You can't really tell from looking at him. sarcoid tends to be even more granulomatous they call it mashed potatoes, KP like he took a scoop of mashed potatoes mashed potatoes and flung it at the back of the cornea. So if you take one step down from that, that's the typical KP of syphilis, which you can see in all of these

19:12
photographs. And on

19:18
the upper right, you can see there these are bigger credit precipitates due to syphilis. Compare it to a variety of different sizes. One can see in this example on the left, by the way, this is the pupil, sorry, my fault. This is the pupil dilated with dilating drops. And what we're looking at here is the lens, but we're looking through the clear cornea to see all of that and the credit precipitates on the back of the cornea. And again, these precipitates can be seen on the cornea. Here's a big one where the blue arrows are, but they can also form nodules on the iris itself, which is what the orange arrows are pointing to. So this is not normal to have those there on the iris. And it's hard to tell just looking through, for instance at these bottom ones on the cornea, but that's what one's an accordion look like they're a little more round, they're more well circumscribe versus these Iris ones, which are inflammatory nodules within the iris proper. Now, I've mentioned before poster sneakier where the iris can scar to the lens behind it due to inflammation. And this is an example where the lens and Iris have adhered together. And then we've put in dilating drops. So the iris is trying to dilate pharmacologically, but it has these adhesions. And so you get this kind of flower petal kind of pattern due to this inflammation, and sometimes with dilating drops, you can break these scars. And you can also go in there with a little instrument and break those scars as well. But you can see that the iris is under tension here being pulled back by the dilating drop, the iris has radio muscles in it that pull the iris open. And that's what you're seeing here in between the areas where the iris is, and he used to the lens behind it. But we don't have a cataract here, I mean, this looks pretty clear. Here's an example of where the pupil was stuck to the lens. And we put dilating drops in and we broke all of them, except this little adhesion down below. So when we see patients with a rightous of any cause, we always put them on dilating drops, to bring the pupil out so that it doesn't scar to the lens. And with a little more dilation, it's even possible that that inferior one here might break.

Here's an example of a couple of the things that we were talking about. We have the credit precipitates. We have Iris nodule. We have adhesions between the iris and the lens. And what the iris is irregular. This is an example of another kind of virus not of syphilis to show you that the correct precipitates can look very different. And that when you see the thicker ones, the granulomatous ones, they look different and lead you in that direction in terms of evaluating the biomarker microscope or slit lamp. Now, there's something called the Tyndall effect. And what that is, is you walk into an attic, and it's dusty, and there's light coming in the window and the light hits the dust particles and you can see them floating around. Well, we see that inside the eye, we shine a light in the eye turn of internal the other lights down. And in this space right here, this rectangular space, that is the space between the back of the cornea and the front of the lens. And all these little dots here are collections of white blood cells floating around and and reflecting back the light, like the Tyndall effect in you know the attic than out the attic analogy. And so we have two different things we have cell which are the which are these individual areas here. And then this background haze, which is called flare, and we see both of those things in patients with active inflammation, and it has to do with leaky blood vessels.

23:50

Alright, this, we're going to go through the other things that syphilis can cause. So this is a conjunctivitis where the conjunctiva which again lines, everything except the cornea is inflamed. And typically syphilis causes what's called a follicular conjunctivitis. If you look carefully, you can see that these little things have a white top to them. They're actually collections of white blood cells and and so that's that's called a follicle and that is typical of viruses is syphilis and a few other diseases but but basically, you know, syphilis acts, it's bacteria that acts like a virus in the eye, it acts like a virus as well and forms these these follicles. Now this is just a more diffuse conjunctivitis where you see swelling of the conjunctiva, which is over the globe stops at the cornea, and it can collect fluid down here again due to leaky blood vessels. So that's, that is due to syphilis. This is a case this is not actually the conjunctiva it's actually deep to the contrary. typo. So this is inflammation of the white of the eye or the sclera, as opposed to the conjunctiva, it can be well demarcated like this, or it can look into the whole light can be red. Alright, this is this is another case of scar itis, where, with a slit lamp, you can say, Okay, this is the conjunctiva. But there's swelling and redness deep to the conjunctiva in the white of the eye itself. And so if you kind of subtract these more superficial vessels, you can see you know that there are very deep vessels here. And this is due to inflammation of the sclera, which is fairly serious, can cause melting of the sclera. It's not urgent, like, you know, emergent today, but it's something that needs to be addressed fairly quickly. sclerites can also form a nodule, and that's what this is. And the the, there's thickening here, the there is inflammation around it. And this actually goes all the way from the conjunctiva deep into the sclera. And here's another case where this is actually more serious where there's melting of the sclera. And it's hard to see that here, but you can kind of see that it's red, and there's a lot of irregularity to the surface. And then what happens if this keeps going is it turns dark, because once the sclera melts, you can see the dark vascular chloride blood vessel layer that we talked about earlier through the sclera if it becomes thin enough. On the left and the right are both examples of the syphilis causing blood vessels to grow into the cornea, the cornea should have no blood vessels, it should have

no opacity. Here's a red reflex where you can see blood vessels going into the cornea. And these typically go away with steroids quickly, but then they come back after a while and can cause a lot of damage which is what you see on the right where those blood vessels drag in opacity, so any place that a blood vessel comes into a cornea after a while it turns opaque. And that doesn't go away. Often wants to do corneal transplant but doesn't replace the cornea. Okay, interstitial keratitis. This is typical of getting syphilis, congenital syphilis and having syphilis acted as a child forming blood vessels in the cornea, with a with a history of having like a week to two weeks of not being able to leave the house due to photophobia. And then coming in and then very late with or without symptoms, seeing these types of findings. On the on your left, it's, I have a very sensitive mouse here, I'm sorry, on the left, I don't, I can't really see what I was looking for in this picture. But there are what's called Ghost vessels where there's no longer blood in the vessels, but you can see the outline of the vessels. All right, it can affect the lens and since those little strings and hold the lens in place are very close to that vascular layer, the lens can come loose and dislodge and come forward or go into the eye. And so this is an example of a lens that is sitting in the front of the eye behind the cornea instead of behind the iris. And on the right we see a lens that is falling into the eye. Hence that large dark space on the left both of these due to inflammation Okay, another example of some of the things that we've seen, we see poster sneakier here, some which have been broken some which are still there. We see a dense cataract This is white, this should be clear. We see pigment from the previous adhesion of the lens to the eye. This is just a light reflex. But this could be a very tough cataract to get out. Not impossible, but but very tough due to all the adhesions. Okay, two more cataracts. The one on your left again shows those credit precipitates. And what happened here is the lens actually ruptured and spilled its contents out into the eye. And again, we have severely the credit precipitates here they actually form the line. On your right we see a dense cataract and the remains of some posters Nichia. Now the choroid is that vascular layer deep to the retina and the retina itself, they can become affected. And these are the white that you see other than the optic nerve, which is where the vessels are coming out of that's all inflammatory debris, and syphilis nodules within the eye. All the under on the right all those peripheral nodules. That's all set FOSS here's scarring from a previous active syphilis which is not active at the present time. If you go here you can see it's sort of more fluffy. And and you know, sort of diffuse in here, it's well defined because this is late, and then the retina over this area cannot see. So you would lose visual field in the distribution of the syphilis affecting the core it in the retina. These are before our modern cameras that take the pictures. Here, we have on the left and the right to different eyes with peripheral syphilitic lesions.

30:52
This is a late picture of syphilis, each one of those dark areas is a scar, and the retina does not see in those areas. Now, if you preserve the macula, the center part right here where all the cones are, they may be able to see centrally pretty good, but if the macula is affected, then everything is decreased in terms of the visual.

31:20
On your

31:21
left, you can see a lot of activity. And on the right, I'm sorry, you can see hemorrhages as well, which is also very common with one core, the core eight and retina are affected by syphilis. This is just a much less involvement with just small little nodules in the retina and an earlier stage.

31:54
And here's a very mild case where we see some yellow, but not super diagnostic could be a lot of different things. Here's on the right, a rip roaring infection with syphilis. And on the left is an angiogram showing a vasculitis. So you see the dye collecting and leaking a little bit where the blood vessels are because the blood vessels themselves are inflamed over and above that effect on the retina. So there's ischemic changes to the retina due to the blood vessels being affected. But you also have direct involvement of the retina. Just sort of giving you a spectrum of what these things can look like to the ophthalmologists when we see these patients. This is interesting. These are this is two cases. Where on the on the left, what's upper on the left is a retinal detachment where the retina is no longer kind of plastered up against the choroid. And one can see that with syphilis, and the right you see an area of blood forming on the inside of the eye, when we look in due to damage to the tissue behind it. Here's a bilateral retinal detachment you can see the retina is free from the tissue below it in the upper left and on the upper left and far right you can see holes in the retina.

33:33
That's what causes the detachment

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there's something called acute syphilitic posterior plaque KhoiKhoi right now but they which basically just has a lot of small white lesions across the retina

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remember I talked about the Paris planet planar the the part of the UVA that makes fluid when that's affected, they just dumped cells into the vitreous. And so the reason that the view is so bad is because there's so many white blood cells filling the vitreous cavity from the pars plana that you can't see into the eye. And typically down below you'll see what we call snow banking. And you can see that in both of these where there's pasta basically forming inside the eye.

34:31
The optic nerve can be affected as well. On the lower left we see a hemorrhagic optic neuritis with inflammation of the optic nerve and bleeding. The next one over is what it looked like after time basically the optic nerve becomes white and the vision is decreased. And on the right one can see again a hemorrhagic inflammation of the optic nerve, due to invasion by Trapani. No

35:05

this is a healthy nerve on your left nice and pink with white only in the center. And on the right is an optic nerve that has become pale due to inflammation from Trump anymore so I'm syphilis can fall they can cause a pupil abnormality called an argyle Robinson pupil is the people that are involved is usually constructed. And basically, both eyes have a poor light reflex, but a good accommodation reflex. So when you have a normal person, and you shine a light in either eye, both eyes get smaller, so pupils get smaller. When you read or you bring something close to you, both pupils get smaller. So with involvement of certain parts of the brain that caused this with syphilis, the pupils can accommodate they react with accommodation, but they don't react to light. And if you want to take a look at the slide deck later you can I have the pathways here for you. I'm not gonna go over treatment guidelines, but just be aware that the treatment guidelines for neurosyphilis are very different. Okay, I'm running a little bit behind I don't think we're gonna get to chlamydia. But I would like to talk about gynecol conjunctivitis because it's very serious and requires immediate referral. So we've defined it as highly dangerous hyper acute conjunctivitis caused by Neisseria gonorrhea, which been treated may lead to vision threatening ocular complications. So the etiology is Neisseria gonorrhea, is a gram negative Diplo Coxide. Resembling coffee beans. It's oxidase positive non spore forming. It's intracellular it's arrived in neutrophils or PMS. There are two of nine species with colonized humans incubation period is three to 19 days and there's almost a million a year in the United States

37:23
I found these on Etsy

37:29
did not buy them okay,

37:33
it infects the surface line with columnar epithelial cells which is on the cervix, urethra, mouth in general and mucous membranes but also the conjunctiva it's pathogenic when identified. So if it comes up in a culture, it's it's not normal flora. There's obviously you know, a difference in how they present symptom wise routines, men and women, where women tend to present later. In terms of diagnosis, we, if the patient's hyper acute if they have tons of pus, and the eye looks super hot, we will culture we don't culture all conjunctivitis. But if it's hyper acute, we culture and these cultures help us refine therapy and decrease complications or infections. transmission. The culture is, is something we do fairly routine. We don't typically do PCR although I want to talk to Dr. Irvin about that.

38:45
All right.

38:47
This just goes through the call tree over it's gonna keep going. The gold standard is the nickel nucleic acid amplification test overall, but it's not approved by the FDA for all sites. And I don't

think it's approved for the eye. But that's how I want to talk to doctor I'm going to see whether or not this is something we can do. We're going to more and more PCR the olden days where we cultured herpes seems a very long time ago, or having to wait two weeks for a negative test. So this would be for Clemente as well. So the conjunctivitis the conjunctiva. We talked about a little last time but it's divided into the bulbar conjunctiva which is the part of the globe and then the palpebral conjunctiva which lines the back of the lid and it stops at the cornea

39:42
unilateral or bilateral hypercube market eyelid edema, market retinas market purulent discharge they like other viruses, like like viruses, this can give you pre pre or regularly lymphadenopathy giving you a lymph node in front of your ear as syphilis can. They can have massive chemosis when it can't close their eyes because they have so much swelling of the conjunctiva. They have intense dilation and intense photophobia.

40:13
Watch for treatment.

40:18
It says the topical treatment is not required we treat topically as well as for systemic treatment. we irrigate and give patients these little vials that we use for irrigation to get all those bacterial toxins off the eye. And we see them daily because of the complications which can occur which I'll show you in a sec. Oh, here we go. So I'm sorry about the gross notice here but this is classically gone a capo, conjunctivitis, tons of pus, tons of everything. This area here is swollen, it's fluid collecting beneath the conjunctiva. This is all Poss, the lives are swollen. But of note, when you look at the cornea here, the reflex of the light and the reflection is pretty regular. There's nothing you know too bad for most of this, although what's going on over here. So we're kind of good all the way around. But the cornea can end up melting due to all of this inflammation. So here is a close up picture of the POS that forms on the conjunctiva. Now, unlike some other types of organisms, this doesn't form a membrane that is this wipes off without bleeding. Whereas other kinds of infections don't do that they have bleeding they form two membranes. Here we have another cornea. Well, you can see why we see these patients every day because the cornea can end up melting right through and then at that point, one can lose the eye being exposed to that hole or the eye can get infected through that hole or sometimes we can save it depending on the timing so just an example of the conjunctivitis

42:12
All right, so maybe copper a complicated by severe keratitis with corneal perforation. This can happen in a day, prompt diagnosis treatment is essential. The degree of corneal involvement can range from nothing to infection to a marginal corneal melt where it's near the edge of the cornea, or a central cornea melt or edema. So this is a corneal perforation. What you're seeing on the top part, the reason that it has those little lines in it as you're looking at Iris through no cornea. So we see a very severe conjunctivitis, the the cornea itself is infected, this part's a little less infected down here. But then all the white and the sort of orangey is infected cornea. And

then up here is, of course, Corneal perforation. So this patient needs to go to the operating room, but a lot of times there's nothing to so to you know, you've put a corneal transplant on top of this, but, you know, this, this actually is here may go way out, may not stop just where the conjunctiva is. And here's another corneal perforation, where it's a relatively small perforation, we first hear basically we would kind of push the iris back in go in from the side and kind of sweep it back into the eye and do a graft over that, that so this is this is probably a salvageable case. But they you have to fix it, but you can't you can't leave him like this. Here's one that's not salvageable. Basically, we've lost cornea all the way around, this cornea is free floating, and there's an area in the middle of of inflammation and pus. This is an eye that we would we'd probably have to remove. Now here's here's a good example of a save. So this looks horrible. There's a hole in the cornea up here. And this is from the literature. This one it says nurse and this is the area here where the the necrotic tissue was cut away. And then we did a corneal transplant up here. Here's the bottom of the transplant. We covered this whole area here. And these are stitches right here and late. can't even tell anything was done.

44:38
But you got to get very lucky.

44:41
All right, and here's where we have something called a hyperopia. Or we have post layering out in the eye. When it's blood we call that a high female when it's passed. It's a hyperopia and you can have both. So here we have inflammation within the cornea and the hyperopia I think you've seen enough of this. Okay, this is a really great picture, but it's maybe a little disturbing. It's it's I was pushing through the cornea. And this was a safe. Just to tell you, this is a corneal transplant that we would do for those cases where, you know, if it's a small peripheral lesion, we can just patch it with a patch graft. And so again, this is a full thickness corneal transplant, with two types of sutures with individual sutures holding in first, and then a running suture that's run after those sutures are put in the knees, patients typically have very good vision. Alright, I don't think I'm gonna get into chlamydia, if that's okay, because I want to be able to answer questions.

45:56
Okay, great. Thanks so much. We do have a couple of questions. One is, could you describe again, what is what you mean by melting with respect to quarantine,

46:09
the bacteria secrete lytic enzymes, which melt the cornea. And they also activate white blood cells, which normally would not be would not be having active enzymes to secrete those enzymes. And so you have melting of the cornea. And you know, it starts at 100% of thickness and you see them daily. And you can see it going down to 80% and 70%. But the tissue is is becoming liquidy. And those collagen fibrils, which make up the cornea, and are stuck very tightly together, just kind of melt

46:45
away. Okay, then someone else says, How does the cornea? How does God arena get to the eye?

46:56
So auto inoculations? And is this very painful? Is it typically very painful,

47:03
it's it's very painful. There are some other types of organisms which deaden the nerve that cause nerve damage. And sometimes they're not as painful, but this does not do that. And these are very painful. And when you see it, when you've seen someone who has, you know, a hyper purulent, conjunctivitis, it's it's very different than your typical crusty AI.

47:25
And then someone says, I have a clinical question about transmissions. And your infection spreading might have 20 women. And I don't know if you can qualify that a little bit more.

47:46
I didn't really talk about committee, I could go back and sort of go through that or maybe it's in my slide deck, can can we is it possible to put that question off for right now or? Okay,

47:59
sorry. Someone else's? How does? How does one get cornea of the gallery of the eye, so auto inoculation, so someone that has gonorrhea, typically generally and auto inoculate so it's through their hands to the eye or someone else's hands to their eye? Can you give us a sense of how often you've seen this that we're in Rochester, you're in Rochester also, we have very, very high rates of gonorrhea here. And in our STI clinic, I would say we see this one to two times per year where we were seeing someone with urethral. Gonorrhea, who also has a red eye that we send a CI, but maybe you're seeing much more

48:43
what we're seeing those patients and then we're also seeing patients who bring themselves in or referred in from other people. It's not common, but I would say within the organization, we probably see

48:53
one or two a month.

48:58
It's not it's not huge, but it's it's enough that we're very aware of

49:01
it. So questions coming in from China, follow them. One other question was for conjunctivitis due to syphilis. Would that be a situation where you wouldn't need to do IV penicillin? If it was solely conjunctivitis? Could you just treat it the way you would treat others primary or secondary syphilis with injectable penicillin? Or would you still treat it as a noreau?

49:35
That's a really good question. Um, the that distinction has been addressed a lot and I think my read of literature says that unless you have neuro structures involved or uveal instructions, structures involved or it's very severe that you don't, so minor eye findings like that, no. No, In Touch over, maybe you will want to answer that. I mean I for us, we typically do not.

50:06
Yeah, I don't know that I would feel confident in saying this is solely conjunctivitis and there's no sclera itis for instance, I would still refer, you know, but I think if it were truly, like outside the eye, make sense to me that you would treat it the way you would treat other INSS, like with injectable penicillin.

50:28
See other questions. Maybe you couldn't run through the chlamydia.

50:35
Okay, I'd love to just kind of say to give her my number but that is that we have enough time we have

50:40
10 minutes okay.

51:13
So actually transmitted infection caused by chlamydia trichomonas which lives as a parasite within cells it's an obligate intracellular organism requires a host cell for invasion growth and replication, like a virus can be transmitted during sex or direct inoculation can be assessed can be passed from infected mother to baby. What are the most common sexually transmitted infections in men 50% of symptoms and women silent infection three species causing human disease, Chlamydia TrackIR Matos pneumonia and Stasi and there are different subtypes which cause different types of problems. So for adult and neonatal inclusion conjunctivitis and subtypes D through K contains DNA and RNA lacks ATP and biosynthetic pathways nonmotile mammals and birds clinical features, pathogenesis pathology similar to viruses just like our other two the typical local infection is urethritis proctitis, conjunctivitis cervicitis. And for all these groups, the conjunctiva there are two forms in the lifecycle the articulate body and elementary body which I don't think we have to go too far into right now. We again, we ended up signing we had a culturing, which I'm no no that that is actually correct, whether we can whether we can do

PCR for chlamydia from the eye or not. So we have not been but I would like to again talk Dr. O'Brien. Characteristics of the conjunctivitis onset one or two weeks after inoculation, via auto inoculation or from a sex partner 49% with inclusion conjunctivitis also had genital chlamydia. Repeated ocular infections rare, can also cause a reactive arthritis and typically a self limited. The red eye is unilateral greater than bilateral redness. papilla formation which I showed you before about follicles, which have white tops, the papilla are have read tops because they're blood vessels that are dilated, the discharge is scant. It's not mucopurulent There can be a little island swelling, there can be a pretty regular lymph node like the others, but no membranes. So here is an example of a papillary reaction on the left where the tip is red. Whereas on the right those are follicles where the tips are

54:09
clear or sort of whitish.

54:14
Again, lots of follicles you can have both. When you see this many follicles, it's typically not chlamydia. It's typically Cat Scratch disease.

54:31
They can develop a keratitis which is not which just inflammation in the cornea and a little bit of blood vessel growth under the cornea but it's nothing like the other like gonorrhea can form these little dots. You can have blood vessels coming in. But you can see the comparison to the other pictures. I mean, the blood vessels are bringing in opacity but not that not that much. And this was steroids and treatment that'll all go away. As you can get these collections in the Peripheral Cornea or central cornea. This is called punctate, epithelial erosions. And it's like if you had a ball of jello and you touch the cornea with a piece of course sandpaper that's what the cornea looks like when it's all dried out and scratched up and this is 100% reversible these are the late findings of fact Korea, you see these these white spots in the cornea?

55:48
Also chlamydia

56:04
okay

56:10
so thank you very much. We're gonna think well hold up, I'll pass the information on about that particular question

56:17
about having chlamydia, conjunctivitis if that could be shared with humans I, I just Googled in it, it does appear like cats getting loosened conjunctivitis. So I just

56:29
don't know if it's the same. I'm sorry to interrupt you, when she I don't know if it's the same subtype or genus? So that's, I don't know the answer to that either. Um, if if that person wants to contact you, could you maybe put that through to me? And I'll, I will, so that you guys don't have to do the work. I'll do the work on that.

56:47
And then to address the NAT testing, there are companies that have produced nucleic acid amplification tests that are in the eye, but as far as I know, they are not FDA approved. And so within New York, at least, you would you would need to do a laboratory would need to do a specific validation, to allow them to use that in that way. But there are tests that are marketed for that purpose, but not FDA approved. So much the way we used to do extra dental testing for GC and Chlamydia, which weren't FDA approved until a few years ago. So with that, I think we'll end here. It's 1258. We have another session coming up. So thank you again, Dr. plotnick.

57:34
Thank you. And thank everyone. Appreciate a great deal.

57:39
So with that, I think we'll have our next session speakers, come online and turn your cameras on. And Dr. Plotnick, you're getting lots of waving hands and claps and several comments saying thank you.

57:57
Thank you back at you. Okay.

58:01
All right. So I'd like to go ahead and speak introduce our next speakers who will be talking about long term infant outcomes after in utero syphilis exposure. And this is a report coming out of Massachusetts. So we have Dr. Amy Trish who's currently working as a pediatrician, and as the director of infection control at Fair Haven Community Clinic in Connecticut. She earned her do degree from Rowan University's School of Osteopathic Medicine in 2015 and then completed a pediatric residency at NYU went on Long Island. Given the fascinating infectious disease cases she saw during residency, Dr. Trees decided to pursue further IV training, and completed her pediatric ID fellowship at Boston Medical Center in 2021. In her free time, she enjoys spending time with her family, especially her young son, and she also enjoys fencing and traveling that's dear to my heart. My daughter's a fencer. And then there's Dr. zoomline, who is an associate professor of pediatrics at UMass Medical School and attending physician and pediatric ID and Immunology at UMass Memorial Children's Medical Center. She serves as clinical faculty faculty at the retaliates STD HIV PTC at the Massachusetts Department of Public Health. Dr. Longo received her BS in biology and art history from Tufts University, an MD from the School of

Medicine at UCLA and completed a pediatric internship and residency at Children's Hospital in Pittsburgh. She was primary care pediatrician and in Cohasset, Massachusetts before starting her fellowship in pediatric ID, also at Boston University Medical Center. And then Dr. Catherine Chu, is the Medical Director for the Division of STD prevention and HIV and AIDS surveillance at the Massachusetts Department of Public Health and serves as the Director of the tele STD HIV prevention training. Center, one of eight STD clinical training centers funded by CDC. She is also professor of pediatrics and attending physician and pediatric ID. at Boston University Medical Center. Dr. Chute graduated from Brown University School of Medicine in 1995, completing a pediatric residency at Columbia, Columbia Presbyterian, and a pediatric residents fellowship in pediatric ID at Boston University Medical Center. She also completed a second STD prevention fellowship jointly sponsored by the Associated Association of Teachers of Preventive Medicine, and the CDC, and then received her master's in public health and epidemiology from Boston University School of Public Health. So we are very happy to welcome all of you to our presentation to our session today and really eager to hear your results. This is something there's there's not very much written about. So with that, I'll turn it over to you. I think Dr. Trish is starting is that right?

1:01:06
Actually, we switch so I'm going I'm gonna do a couple of intro slides, and then I will hand it over to Dr. Trish. So the learning objectives today is to just look at some epi in, in the US and also in Massachusetts. I'll go over some basics about congenital syphilis and the guidelines for treatment, and testing and pregnancy. And then Dr. Trish will go over the elements of our study. So just looking at what's happening with congenital syphilis in the US, these are the data from CDC. And there have been some significant increases in some disturbing movements in data for both infants and pregnant persons. So just to highlight between, you know, 2011 to 2020, the number of cases of congenital syphilis increased about 500%, up to almost 2200 cases in the US. And this was in parallel with an almost, you know, 400% increase in syphilis in pregnant persons, infectious syphilis between 15 to 44 years of age, and just between 2020 and 2021. In the US the cases of congenital syphilis rose again, you know, 30%. So this is a really concerning increase. Next slide. These are a data for Massachusetts, which parallels what I just showed on the prior screen. So the cases really paralleling congenital syphilis and cases in pregnant persons. And if you click one more, this led to a clinical advisory being released in Massachusetts in June 2020. Where we started recommending not only syphilis screening in the first trimester, which is sort of standard of care, but also adding additional testing early in the third trimester around 27 to 20 weeks. And this was prompted in particular by three cases. In 2020, we had two stillbirths with syphilis, and also an infant born with congenital syphilis who had rash jaundice and hepatic splenomegaly. So this prompted that additional screening. Next slide. Just a brief overview of congenital syphilis, so when it does happen, and it is happening more and more, there are a variety of signs and symptoms that you can see. One is hydrops fatalis, which is basically a fluid buildup in the infant's tissues and organs, which causes significant edema, as well as enlarged placenta, but between 16 and 90% of infants might be completely asymptomatic, which is why screening is so important during pregnancy. For early congenital syphilis, so these are the children that present before the age of two you can have a

variety of manifestations. So one unfortunately, as we saw, was stillbirth. But infants can be born with rash nasal discharge, also called Snuffles. And the nasal discharge is actually full of trapanese. It's full of the organism. Skeletal abnormalities, enlarged organs and jaundice. Late congenital syphilis is manifestations occurring, older than the age of two and this can really affect any organ system. So in the lower right, that's an image of Hutchinson teeth, which are teeth that have this very nice specific notch in the middle. So some of these diagnosis diagnoses may be made, for example, with dentistry. So if you advance one, the most important pieces here are that timely treatment of pregnant persons who have syphilis can decrease the transmission to the infant by about 98%. So it's a never event, something that should never happen, and it's entirely preventable. Next slide. So syphilis in pregnancy. Some of the risk factors for pregnant persons would be multiple sex partners, you know, drug use, or transactional sex. If a pregnant person does not have any prenatal care, or comes late to prenatal care, as was seen in some of the cases that I mentioned earlier in Massachusetts, incarceration of self or partner unstable housing. Some of the recommendations would be like I mentioned briefly to screen all pregnant persons at the first prenatal visit using there are different testing modalities that one can use. And then if you're using a treponemal screening test as your initial test, and it's positive, you do need follow up testing with quantitative a quantitative test. And this would include something like an RPR, which comes with a titer. Because titers are really essential for monitoring response to treatment, and any pregnant persons and high prevalence communities. In addition to the testing and early pregnancy, at the first prenatal visit, you want to consider serologic, testing twice at 20 weeks, and then again, at delivery. Next slide. So some additional things about syphilis and pregnancy. Anyone who tests positive and is pregnant is considered infected unless you can find evidence of prior treatment. And adequate treatment, like I'll define on the next slide in just a moment. And you want to make sure that their antibody titers have decreased as recommended for the syphilis stage. So we know the more advanced the stage, the longer it takes for titers to come down adequately. But the highest risk to the infant is really during primary and secondary syphilis. And so what we're looking for there, if you've if you're following in RPR, is really after treatment of fourfold decline in the next six to 12 months, and following that pregnant person very closely. Next slide. Treatment adequacy is defined by CDC as the following. So really, penicillin G is the only known effective antibiotic. For syphilis in pregnancy, there are no proven alternatives. So if a pregnant person has a true, you know, IGE mediated type one hypersensitivity, you really want to try to desensitize and still treat with penicillin G, because that's going to be the most effective treatment. Pregnant persons need to be treated with the recommended regimen for their stage of infection. And the intervals have to be appropriately spaced if there are so for example, for late late and syphilis, we treat with three doses spaced seven days apart, there's a little bit of wiggle room, but not too much. So if you have missed doses that are, you know, greater than nine days between doses, that's not acceptable for pregnancy, and you have to start the three dose series all over again. And in addition, treatment does need to be more than four weeks prior to delivery to be considered adequate treatment. So I'm going to hand it off to Dr. Trish for the rest of the presentation. So yeah,

1:08:58

so I'm going to talk a little bit about our study and the results of our study. It included.

1:09:05
All of our

1:09:07
participants, or all of the individuals in our study were cisgender women. So we're going to use the terms mother infant and maternal throughout this talk. So basically, a little bit of background clinical outcomes. For syphilis infected infants are quite well described in the literature. But there's been very few studies looking at exposed but uninfected infants. There's been a couple of studies. The first one was in 2018. With or geese at all, it was a very small Canadian cohort study, where they looked at 18 infants who were born to women who were diagnosed with infectious syphilis, and then it looked at the babies and those that were both diagnosed with congenital syphilis and those that were not. And they found that infants in both of the cohorts with and without congenital syphilis did have delays in speech and language development at 18 months. Not all of them four out of the 11 that did have congenital syphilis and three out of the seven without congenital syphilis. And then there was another study in 2019 by Lao at all, that was another prospective cohort study. This one was in China, and it followed infants of pregnant women who are diagnosed with syphilis during pregnancy with positive syphilis treponemal and non treponemal antibody testing. But in this study, they were not able to find out the stage of syphilis for the mothers. This study did find that growth velocities are similar for weight length and head circumference compared to other siblings, unexposed infants, born around the same time to mothers have similar maternal ages. So for our study, we assessed 72 Mother, infant dyads, where the mom had positive tripping email and non treponemal syphilis testing during pregnancy, and who gave birth between 2015 and 2017. In Massachusetts, we looked at maternal infant characteristics, maternal syphilis stage and adequacy of treatment and infant outcomes, including growth, development and specialty referrals. And we looked at these through age two years of age.

1:11:31
And I'll just briefly mention the pregnant persons in our study where cisgender women and we're going to use the terms mother infant and maternal during this part of the presentation.

1:11:43
So yes, this is our study population was cisgender women with newly identified positive syphilis. And this information was extracted from the Maven database, which is the Massachusetts spiritual epidemiologic network, which actually receives 95 to 90% of all positive STI results on Massachusetts residents through electronic lab recording. So it's a very useful database for this. And our exclusion criteria were infants that were not born in Massachusetts or infants where no maternal or infant testing or treatment information was available. We did also look at the maternal syphilis status. As part of the routine surveillance in Massachusetts research analysts call clinicians to ascertain the pregnancy status of all Massachusetts residents aged 15 to 45, who are capable of pregnancy who test positive for syphilis. The simplest stage testing and

treatment history are is then recorded as part of the routine surveillance for pregnant individuals. So then, using the information that was in Maven, including all of this information, we looked at maternal stage testing and treatment and we evaluated both myself and Dr. Wong who evaluated to ensure that these the maternal stage was accurate. And if there were any discrepancies, doctor, Dr. Chu also came to help with a final diagnosis or decision. Um, so our outcomes the hospital, we use the hospital discharge summaries and the Massachusetts immunization information system which basically has all of the immunizations for the children to identify the infant's primary care clinicians whenever possible. We contacted the infant's primary care clinicians to find out information and growth, any specialty referrals and any concern for developmental delays. We also looked at the growth parameters and the physical exam findings. At the well child visits closest to age one and two years of age. Sometimes it was a month before month after. And then any referrals or other concerns were also abstracted from the patient's charts. In terms of the statistical analyses, the analyses were initially stratified by adequacy of treatment begun greater than four weeks prior to delivery based on the CDC STI treatment guidelines that Dr. Wong Gu talked about. And then differences in clinician reported developmental delays and referrals to pop them ology audiology and neurology. By maternal syphilis stage were tested using chi square statistics or Fisher's exact tests. We also used a nova to compare differences in growth parameters at one and two years of age. We looked at weight height and head circumference percentiles and And then for direct, specific comparisons between the different Cipla stages, and we also use done it's tests or multiple comparisons. These are this these are some diagrams of our results. And the somewhat surprising outcome that we found was despite adequate maternal treatment, infants born to mothers with secondary syphilis, when compared to infants born to mothers with latent syphilis had a lower average eighth percentile at one year of age compared to those born with two mothers with latent syphilis. However, that height difference was no longer present at two years of age. But they also had the infants born to mothers with secondary syphilis also had a significantly higher rate of developmental delay compared to those born to mothers with late late and syphilis. So this sort of led us to the conclusion that syphilis exposure during pregnancy may have implications for infant growth and development, even if the pregnant person and infant receive adequate treatment. So again, there was the statistically significant Howcome differences between secondary and less than infectious late latent group, which sort of served as our control group in this study. In the end, there were no associations or no differences between early latent and late latent syphilis. We did not have any mothers that were diagnosed with primary syphilis during pregnancy. So we were unable to ascertain whether primary syphilis would have different outcomes than lately than syphilis. Although it would stand to reason that it would, it may. There was also no differences based on adequacy of maternal treatment, which we were a little surprised about. But we fortunately, we only had a very small number of inadequately treated mothers. And we also used the strictest definition of adequate treatment, the majority of our inadequately treated mothers were treated less than four weeks before delivery, and that's why they were considered inadequate. In terms of the study strengths, this is, as we talked about, it's not a well studied phenomenon yet, it's one of the first studies looking at the longer term outcomes of syphilis exposed, but uninfected infants. It also included all infants born in Massachusetts over these three years rather than at a single site or single hospital. And we

there were quite a few infants lost to follow up. But we were able to follow 72 infants through two years of age, which was very helpful. And it was also helpful and interesting to speak directly with the primary care offices, they were able to elucidate their concerns, not just physical exam findings or referrals, but any concerns that they had noted in the chart. Of course, there are some limitations to this study, we did have a small population size, especially given that so many were lost to follow up. Some infants could not be followed up, and there is a chance that the infants without continuity of care may have also had worse outcomes in general. As you know, this was an observational study, so we were unable to determine causality. And Massachusetts DPH does invest a significant amount of time and resources in identifying and following pregnant persons with syphilis. So uncertain how general generalizable these results may be to the rest of the country. In conclusion, I mean, it looks as though based on our data exposed but uninfected infants born to mothers with secondary syphilis may be more likely to have developmental delays and possibly some early growth issues compared to those born to mothers with late late and syphilis. It would be great in the future if we could also look at comparisons with unexposed infants and work on adjusting for any other potential confounders. But I think our our data did show that it's worthwhile to pursue larger studies nationwide, and hopefully with some longer term follow up, which may lead in the future to an algorithm to follow all syphilis exposed, even uninfected infants to monitor for developmental abnormalities. And then this is just a little bit about Massachusetts, and how it sort of the Public Health has sort of led to multiple actions that have aided To pregnant people and infants, so, pregnant pregnancy ascertainment in persons 15 to 49 years of age with infectious infectious syphilis led to as needed clinical support and real time input to align care with STI guidelines. It also led to prevention of reinfection through in depth partner contact tracing and treatments. And now we know that longer term follow up for in utero syphilis exposure may have associated for infant growth and development even if mom is adequately treated for syphilis during pregnancy. The third trimester screening for syphilis that Dr. Longo talked about has already led to identification and treatment of a handful of persons who acquired syphilis during later pregnancy, and hopefully, and prevented some worse outcomes. And then the root cause analysis and congenital syphilis order review led to laboratory interventions like reflex testing to improve syphilis testing, turnaround time, planned outreach to improve pregnancy testing in substance use treatment facilities, as well as planned analysis of character, characteristics of cases averted, hoping to identify perfect protective factors as well. So the collaboration between public health officials and petitions has can be very useful in stemming the tide of in this case, congenital syphilis. But it does take time, and definitely a lot of resources as

1:21:42
well.

1:21:46
And there is a wonderful STI treatment app sponsored by the CDC that is available for iPhone, all the Samsung Android. And it's very useful. So if anyone is at all interested, I would suggest downloading it for treatment guidelines. And I think that's about it for us. And does anyone have any questions?

1:22:18
Yes, thanks very much. Dr. Sue. So yes, there were a couple of questions. Thank you very much. And there's been a little bit of discussion in the chat back and forth. So I just wanted to read those questions and the answers so that everyone could hear that. So one was a comment about whether the recommendation for third trimester testing in Massachusetts was a was a recommendation or a regulation or a law. And it looks like the answer was that it was a recommendation, but that it was taken off by approximately 80% of the obstetric practices. And then there was further comment that in New York City, third trimester testing has been mandated. So it has been a regulation for a few years. And actually, it is now mandated in New York state as well, for the past several weeks. So that was part of the adoption of the New York state budget, it was tied into language, including that. So it actually will be a regulation for to mandate third trimester testing in New York State going forward now. And then there was another comment about what will you do when if you try to desensitize a pregnant individual, and it fails, or perhaps the risk of anaphylaxis is just so great that they're unwilling to do desensitization? I personally have never faced that. But have wondering what I would do. But I think you would, you would most likely end up with something like SEF triad zone as the next best alternative. So fortunately, that's that's a rare events. The desensitization is quite a big deal is an ICU admission. So it's a serious undertaking.

1:24:17
Yeah, we did have one woman in our study who was admitted to ICU for desensitization, but she, she was desensitized, and the baby was considered uninfected and she was adequately treated. Sounds great.

1:24:29
I'm looking because we're getting questions in the q&a and the chat. I missed any. I don't know if you could put up that data slide. Again, when you refer to the growth, it seemed like there were differences in year one, but they had cleared by year two, and I wasn't sure about the developmental delays. Was that the same pattern?

1:24:53
The developmental delays were not that was at any time during the two years. So that It wasn't based on age, that was just any, anytime during the two years. So I'm it. There's no comparison. But for the growth, you can see your one, there is a little bit of a difference and your to all of the heights have sort of there's no statistical difference between them.

1:25:24
And did you find that that in the pediatric practices, did they attribute those developmental delays or even the growth differences to syphilis, or did they consider the syphilis treated? So that wasn't sort of in the framework of, I

1:25:39
think most of them that syphilis was considered treat, treat it. So it wasn't it didn't tend to be attributed to syphilis exposure, there were some of the infants when they were younger, there was more concern about possible, like, was, is their developmental concerns based on syphilis, but by one year of age, and definitely by two years of age? It didn't seem no one really attributed to the syphilis now.

1:26:12
Any more questions? See any. Any last minute comments?

1:26:24
I'm seeing one question. Actually, I don't know if it got addressed yet. But why wasn't the study conducted with primary with women with primary syphilis?

1:26:32
Oh, so that was just because we actually did not have any women who were diagnosed with primary syphilis during these three years who were pregnant. I think a lot of I mean, there were a few symptoms, symptomatic women, but the majority was just diagnosed either on normal prenatal screening, and then we were able to figure out if it was late, late and early latent or secondary, based on previous testing, which was also available in Maven and very helpful in staging because otherwise, we would not have known a lot of their syphilis statuses.

1:27:14
Man make a comment. Certainly,

1:27:20
I was just gonna say, thanks to Dr. tration, Dr. Juan Luz work, we were able to pull together additional information by talking to all these pediatric practices. So it was presented at pas last year. And then this year, we highlighted it again, because congenital syphilis is, as you all know, a huge problem growing across the nation. So we had several 100 participants at a pediatric academic societies meeting. And when we highlighted these data, we were very cautious because really, we were only able to find six exposed infants from the secondary group, which hinted at this need to do a larger study. And I do believe a larger study is ongoing with much larger birth cohorts. And much larger, larger institutions like Texas and Nationwide Children's, several children's hospitals are now collaborating to look at longer term outcomes. So we hope that there will be more data to that's what our colleagues in Texas and Nationwide Children's told us.

1:28:28
It's great. So that would probably there's a couple other comments coming in now. But Dr. Weinberg brings up that you wonder about the socio economic confounders about growth in developmental delay, regarding secondary syphilis, which is wired. But of course, secondary

syphilis may transmit more so could go. There's lots to think about there. And then someone's writing in in my clinic, we have been following a pregnant woman who acquired syphilis, and then continues to be exposed to syphilis, through an untreated partner, who presumably is known to have syphilis. We have already treated her several times with kind of fill in, is there an advantage to treating her every time she returns to the partner throughout the pregnancy? Would that be the recommendation?

1:29:16
It's my understanding that Yeah, she does need to keep getting treated, and figure out a way to get her partner treated somehow.

1:29:33
The devil is always in the details of an individual case situation. And the hard work that was also represented in this dataset was many times how often it was our field epidemiologist driving these individuals repeatedly in for their treatment, or making it easier removing every system barrier or speaking directly to the partners to get them in for treatment. Those are the The really tricky things that really difficult things so that you can ameliorate any probability untoward outcome.

1:30:07
As you all know, that sounds like a very difficult situation. Okay, without which we're just at 131. So I think we'll end today. Thank you for all of our presenters and our attendees.

[End Transcript]