Congenital Cytomegalovirus Screening and Follow-up in Minnesota: Process and Lessons Learned to Date.

>> All right, hello, everyone. Thank you, Amanda. I always like working with Amanda. She's fabulous. So, congenital CMV screening in Minnesota, we're going to touch on our process and current lessons learned to date. We have a large CMV team in Minnesota, so these are the people that are working on this presentation.

Hang on. There we go. Okay, the learning objectives, understanding what led to our legislation that the newborn screening is a new condition and what brought us to the approval and implementation process. And then, some of the planning and coordination.

I don't have any of my notes. All right, we're just going to go. I can't see anything here. Okay, so in Minnesota, we were fortunate to have the Vivian Act, so that is recent legislation that passed requiring the Department of Health to provide education, resource provision, and outreach about congenital CMV, and it will be led by our Minnesota Department of Health, family health division. It also required that The advisory committee on inheritable and can't disorders review the provision of possible inclusion on the newborn screening panel. If they reviewed it and approved it then there would be an increase on our blood spot fee of $43.

The key here is the legislation did not say we had to do universal screening. It did not say how we had to do universal screening. It did say we had to consider it. So, in effect, for any new condition being considered for our blood spot panel or just to be added to our newborn screening program has to go through this process that was set up in 2019, I believe, that is in my notes as well, so in fact, for this, the Vivian Act really served as the formal nomination to our advisory committee.

What was next was a scientific technical review, so MDH pulled together a work group of providers that would be seeing these kids and parents and facilitated them working through the readiness criteria, so they did all kinds of information gathering, fact finding, talking through, you know, they had their own expert opinions and processes. So, it was very multidisciplinary group. What's important to know about this scientific and technical work group is that they also were not coming up with a recommendation or saying that Minnesota had to add this to their panel. They were, you know, expert panel solely looking at the readiness criteria of it meeting -- that they had to meet.

Once they were done with their review, it would go to an advisory committee. They report out to the advisory group. This is where our EHDI committee reported out what we felt that the larger advisory committee needed to know, and there was discussion and voting. And that scientific review looked like this, so there's a maximum of six required criteria and this work group felt that CMV met all six of those required conditions. And then of the supporting factors, I think that is 24 total, so 15 of the 24 supporting factors were met. So, overall, that is what was presented to the advisory committee.

On January 11, the advisory committee asked questions, reviewed and voted and 16-3 it passed for universal screenings. So, then it went to our commissioner of health who approved the recommendation and then the fee increase, which put our specimen fee or screening fee up to $235. We do screen for a lot of conditions, but okay.

So, then we went into program-wide planning. We already have been doing things in the background as we were preparing information for the advisory committee and requests of the legislature, but this is when we really all came together, and by "we," I mean operations unity, our lab, blood spot follow-up, where EHDI is housed, communications, we were meeting weekly. We had dedicated teams channels, a shared project timeline, it was a little overwhelming, but also exciting.

We did determine that we would be screening using the dried blood spot, so that is qualitative real time PCR. I'm not a laboratorian, but you this is what they told me. It detects CMV DNA and extracted from the dried blood spots. One big change, as we are updating our specimen card, instead of five circles, we will be getting six. So, the hospitals aren't having to learn a new collection method. They are very familiar with how to collect on the blood spot, but they do have to add another blood spot on there. So, the impact on our hospitals is minimal. We don't have to go to them for the results. It is all done in our lab. Careening right now is performed Monday through Friday, not on weekends and most holidays, but we do screen every specimen.

So, we had to work through changes to our laboratory information system. So, currently, we have four units working with CMV and three different information systems, really figuring out what is that going to look like? How is one program going to let the other program know? What are those triggers and when is that going to happen? We did have to work through some space accommodations for new testing and instrumentation and then the develop. Feel free to jump in at any time.

>> You're doing great.

>> We have funding, thankfully. We are very lucky. we know we are very lucky. So, a part of that program-wide planning is hiring and training more staff. Posting those implementation work group meetings, so that technical and scientific review work group became our implementation work group, with a few additional people. We really utilized, tried to utilize the experts around us and figuring out how we would make it work in our current system to the best of our ability.

Updating materials to include CMV and creating new materials, so all of the internal ones you can think of that were new like SOPs that are specific to CMV, job aids, fax back forms, etc. There are the external materials, not just adding to what we already had, which we needed to, because we have general newborn screening fact sheets that we had to add CMV to it, but parent materials, audiology guidelines, provider materials, again, we looked to our experts and worked with National CMV and got input from Minnesota families. There is a lot of communication went to providers and the public, and working on what was that messaging going to be, how is it going to be given in multiple formats, if possible.

At the same time, we know we are going to miss some kiddos with congenital CMV, because we're starting with blood spot and the sensitivity we're using, the average sensitivity of the study, because we haven't tested enough kids to say what ours is. So, we're envisioning 75%, so we know we're going to miss some kiddos. So, we're working to add congenital CMV to our communicable disease rule to help us identify the false negatives, which will make our program stronger as we learn more.

So, really, I have used this slide before and I wasn't sure if I was going to keep it in here, but four big buckets, right? The blood spot screening result, innovation, just in time education, and confirmation of results and connecting families to information, resources and supports, completing ongoing data collection, integration and really analysis for public health, which we will touch on a little bit later, but really building our newborn screening system to the capacity to share equitable access in interventions.

So, here is kind of a look at our system. We're estimating about 65,000 births. We anticipate using the prevalence, the cCMV presurveillance dance, using the average rate from the Minnesota study, we are projecting a 75% detection rate, so that means 219 babies with congenital CMV should be detected through our universal screening program and hopefully, the 73 will come along as well.

Okay, the CMV screening results will go out with the rest of the newborn screening blood spot report. It will say CMV not detected or normal result, again, we do expect some false negatives or CMV detected, at which time, MDH will actively follow, there could be false positives due to age or contamination, we're going to work through that. But once we have the CMV detected, then we have a genetic counselor that calls the primary care provider or the NICU if the baby is still there and provide "just in time" information and education. So, the biggest thing, we will recommend urine CMV PCR by 21 days of age. We're not encouraging saliva.

And then we will fax the newborn screening report and informational sheet to to provider and that will include information that they can give to the families as they go for that information test. We will continue to follow to obtain the diagnostic results. We may get them from the PCP via fax or phone or do have chart extraction at some facilities, so we may use that if access exists. And really trying to minimize the impact on to providers by doing as much as we can on the Department of Health side.

So, the outcomes of the blood spot screening, again, false positive. We expect them to be minimum and no further follow-up would be needed, unless there are clinical concern. The true positives will be -- that is distracting, isn't it? The true positives would require additional evaluations. I will talk about that on the next slide. If they're symptomatic at birth, an ID consult will be encouraged, if they are asymptomatic at birth, then they are followed up by their primary care provider, again, this is new, so we will see if we make adjustments as we go or not.

All confirmed cases receive additional tracking and longitudinal follow-up. Sorry. Okay, so these are the additional testing that we are recommending or follow-up that we're recommending for all confirmed cases. Laboratory testing, pediatric diagnostic, audiology appointments even if they passed the newborn screening test and continued regular audiologic monitoring. We are requesting that the audiologic evaluation happens within one month of their timeframe of their confirmation. Cage ultrasound if they need it an MRI and early intervention.

So, we are very fortunate in Minnesota to have a fabulous longitudinal follow-up team that, at the same time, of that confirmation begins the process of supporting and connecting families. Do you want to go ahead?

>> You're doing great. But if you want a break. You let me know.

>> So, connecting families to resources and supports after that confirmation or at the time of diagnosis. MDH used their resources and worked with experts to put together information for families and caregivers. They will get print materials from MDH, but it is also available electronically and on our website. Let's see, the packet will include information, short term and long term follow-up community resources and supports.

More exciting, MDH will make a referral to our local public health department in the county that the family lives. So, a local public health nurse contacts the family and really to assess where their needs are at, and that's not just about the CMV diagnosis, but as a family, where are those needs? And it is family led. They can opt out. Maybe you want to talk about it.

>> Yes, they do a nursing assessment. Most of these public health nurses know about the implemental health and sometimes they are visitors as well and they are helping to raise the floor for families to do all of these recommended things. They need to make sure they are feeding their children, right. They may need housing support or transportation or other resources, so some of those nurses can help with those things. Also, they can make a backup early interventional referral if that hasn't been done. They will ensure that will happen and help track with this follow along program with ages and stages questionnaire.

>> In local public health, wave long-standing relationship with local public health. They work as an arm with MDH. They have been following our children with confirmed permanent hearing loss, so this was a good fit to continue with. so, parent-to-parent support, we know how important it is. We know through the EHDI work, the value and the importance, and we are excited that there is a pilot program for parent-to-parent support in partnership with the Minnesota Hands and Voices team. So, it is going to start with families and kids who are symptomatic. They will receive one-on-one support from a parent guide and they will have a directory referral from the Department of Health.

>> I will add to that. It will be -- so Minnesota Hands & Voices has a contract, with MDH to be kind of one of our arms to follow up and similar to what we do when we send to the local public health. They have a parent of a child with CMV already on their staff. They were able to just do this pilot work, you know, in their existing budget, so they are working very closely with our nurse specialists and longitudinal follow-up to know, first questions to be ready for if parents have, and again, having the conversations be parent led. They will follow up on all babies with hearing loss and CMV, and then the pilot part is for those kids who don't have hearing loss, but they have CMV only, but maybe at risk for other things, so they will be -- that's the pilot part is the symptomatic babies who don't have hearing loss.

>> So, we know congenital CMV is a condition known to hinder growth and development. It is an automatic qualification for early intervention in Minnesota. Like Amanda mentioned, many states have that. And we will refer all children through the "help me grow" which is our early intervention and sometimes backup referral. They may get two regardless. They are going to get referred.

Minnesota also has a follow along program and it was mentioned before. We're going to encourage enrollment in the follow along program. It helps parents and helps them track their child's development. It is free. It is no cost and offers professional support as well.

Of course, hearing monitoring, long-term hearing monitoring since we know hearing, changes in hearing can develop at any time. So, Amanda talked about the Minnesota guidelines. We do have a handout on the back of the chair with a QR Code that will take you to our CMV guidelines for audiologists. We pulled together, again, using our experts, pulled together a working group and it was then presented to our EHDI advisory committee, and they passed it. So, we've been sharing it widely with all of our audiologists, but essentially to have the professional -- of course it is professional, the diagnostic AVR tests by one month of age, no later than one month after the confirmation of CMV. We're recommending they have a second diagnostic assessment, typically by 4 or 5 months of age, because they can have that done without sedation and show the stability in hearing. Our work group felt the vestibular function screening needed to become a part of this practice. So, vestibular functioning screening is looking at the CDC checklist, right?

>> Yeah, so as a work group, felt like it needed to be the vestibular function screening should be available to all providers to do diagnostic evaluation, so if there was any concern raised with that, that they would end up to go seeing a vestibular specialist and then management accordingly. But they -- we do anticipate that with, like, growth of capacity for programs to do more diagnostic vestibular testing that these recommendations may change overtime, but it's a start. At least to start looking at the motor milestones.

>> And then test every three months until age two, using the typical test battery and every 6 months until 6 every year through age 10. Again, there are asterisks on all of it, because the timing and types of evaluations need to be made in conjunction with the family and what their needs are, and balancing that, right, but it is a starting place, and what we can strive for. I forgot what I was going to say. Oh, the 6 to 10, so in Minnesota, we already have in place that any child with a newly identified permanent hearing loss has to be reported to the Department of Health. And so, moving forward that's going to continue. That hasn't changed. And I'm almost out of time.

Okay, so I mentioned surveillance earlier. We can't wait to have more data. We don't know what we don't know, right. It is just the tip of the iceberg, but our plans are to describe, hopefully, the epidemiology of CMV in Minnesota. Looking at the spectrum of the disease, identifying at-risk groups and disparities. We have epidemiologists, we're lucky in that way. We know we're lucky. They are going to be put to work. Really evaluate newborn screening for CMV, the test performance, hopefully, make adjustments and see improvements and determine if it improves outcomes, having the education and follow-up.

So, some lessons learned, again, feel free to jump in. There are unique challenges. Being the first state to universally screen for CMV and using dried blood spot that is unique in itself. CMV is also the first infectious disease on the newborn screening panel. It's been -- there have been a lot of conversations, most infants confirmed may not or will not manifest symptoms, so it is just a unique condition. We also had a blood spot printing card error, so sometimes you have to roll with it, and expect the unexpected sometimes. It didn't stop us. Still moving forward.

I mentioned this throughout the presentation, but listen to and use your experts that communication and communication, and communication internally, externally, every step of the way has just been one of the most important pieces. Yeah, and then patience. A lesson in patience.

>> Yeah, with any new thing and working on it with a bunch of teams, we go down a certain track and there are pivots because of management decisions, that we all had to deal with, so having patience and grace for that.

>> Yes, definitely giving grace. We also -- some things we learned with audiology scheduling and I don't know if other states already doing targeting screenings already know this, but we had case where is they were scheduled for the rescreen instead of the diagnostic testing. The communication to to provider is schedule or they need an audiology diagnostic assessment, but to providers are used to sending them to audiology, so that is what they did. They sent them to audiology, so that tells us, well, we need to look at our messaging to the primary cares about what we are asking them to send and when we talked with audiology, they said, we need to know it is CMV, because then we can maybe get them earlier if there is a lag. There's some -- what was it? Something with the order.

>> Yeah, they needed to put CMV on the audiology order and help facility getting these patients preregistered.

>> Right, because some of these infants were not on their parents' insurance yet, so the schedulers would push it off if they didn't know they had to do the workaround. There is more communication and probably some adjustments we need to make and work with our audiology clinics, but we're all committed to doing that.

>> I think we have one minute.

>> Yeah, we do. Lots of contributors. It takes a village and I know, we are so thankful if our CMV village. And then the exciting part, so we successfully had a go-live date of February 6, 2023. We had a big press release and media coverage and there were so many articles. It was so wonderful to see. It was exciting. And people asking questions and CMV being talked about, and in that first week, we had positive results. Right now, we have six confirmed positive, urine confirmed positives that were positive on the less than a month, yeah. Five of them passed their newborn hearing screen, so they never would have had their screening. So, it is exciting. More to come. You know, it's February 6 was not that long ago. Oh, yeah, a month about. So, we are just very excited. It is a labor of love for me, and it's just been a collaboration. I know I have a minute left.

I was just telling Amanda, our commission, Minnesota commission for the deaf, deafblind, hard of hearing in Minnesota is giving an award to the two parent advocates that were front and center of the Vivian Act and it just shows the impact and the importance of the collaboration. The picture is of Leah and her daughter Vivian and son. I think that's it. Yes. So, maybe questions. Maybe not.

>> And if you want to find our things, we're quickly changing our websites, but we will have a shortened URL soon that is just our state website slash CMV. Right now, if you Google MDH, which is Minnesota Department of Health and CMV, you will get our stuff pretty fast.

>> And there is the handout for the guidelines. Any questions? You probably want to get to your next session. yes Alison. I can restate it.

>> In thinking of asymptomatic -- [away from mic]

>> Okay, so the question is, in thinking about asymptomatic, what are we doing for follow-up? We're doing the same follow-up. Is that a mic drop? Lights off.

>> I will take that, too. I think all of the families with positive urine confirmation are going to be getting the written communications in the mail, and they will all get a nursing assessment from the local public health nurse, and they will all get an early intervention referral and offered that follow along program to look at their ages and stages, and in addition to that, the families of kids who have hearing loss concurrently with their CMV will get called by Minnesota Hands & Voices and go and talk to their CMV specific parent guide, and then, like, 20 or so kids that are more affected, their families will get called by Minnesota Hands & Voices as well.

>> But the recommendation for the initial diagnostic testing and the follow up on those is for all of the kids.

>> Audience: [away from mic]

>> So, the question is regarding the 75% sensitivity. Again, that is from our study. Our method, we don't have a set yet, we're basing it off of the study, but adding it to the communicable disease. Maybe they had a CMV test, maybe they had a urine test in the hospital and it was positive and our testing was negative, we would get that result from the lab, because they would have to report it. So then we could use that to --

>> [away from mic]

>> We don't know.

>> Trying to cover all basis, Alison. As much as we.

>> You can contact any of us with questions.