NewSTEPs
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Critical Congenital Heart Disease Webinar
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Presenters: Dr. Lorenzo Botto, Amy Nance, Dr. John Hokanson

Please direct all comments/questions pertaining to this webinar to Thalia Wood at Thalia.wood@aphl.org or 240-485-2701.

Thalia Wood: This is Thalia Wood with APHL. We'll wait one more minute and then we'll get rolling. Thank you, everyone.

We'll go ahead and get started. This is Thalia Wood with APHL. I'm going to turn it over to Lisa Hom from Children's National, one of the co-chairs of our work group to introduce us as we get rolling. Lisa, are you on the phone? Lisa?

Lisa Hom: Hi, Thalia. Can you hear me? I just star 7-ed myself.

Thalia Wood: Okay. Yeah, I can hear you. Thank you. Go ahead.

Lisa Hom: Great. Good afternoon, everyone. Thank you for joining us for the webinar on Critical Congenital Heart Disease training this afternoon, or morning. Just to give you a brief overview of our webinar today. First, Thalia from NewSTEPs is going to give us a brief overview of the grants, the CCHD screening grants from HRSA. Next, we'll hear from Dr. Lorenzo Botto from University of Utah and Amy Nance, also from Utah. Next, Dr. Hokanson will speak from Wisconsin. Last, We will progress in that order.

I also wanted to just inform everyone that we will be having some opportunity for questions and answers following each presentation. With that introduction, I will go ahead and turn it over to Thalia.

Thalia Wood: Thank you. I'm presenting three slides for HRSA. Lisa Vasquez was not able to join us today. She did provide me slides. Three years ago, HRSA provided some funding to state programs to help them implement their CCHD, critical congenital heart disease screening within their states. As

you can see on the screen here, these are the program goals that HRSA identified when they put out the guidance for this grant.

They ended up funding six states. Actually, one was a collaborative. Virginia, Wisconsin, Michigan, Utah, New Jersey, and then the New England Collaborative, together, the states that encompass the New England Genetics regional services. There were definitely some grant requirements that were required of the grantees. What's happening currently is that the three years of funding is just coming to an end. We're going to hear from three of these states today, Wisconsin, Utah, and the New England Collaborative. In a few months, we hope to hear from the other three states, find out what their experiences were with the funding and how they were able to license and enhance their programs.

Here are some of the program outcomes that were identified to a draft manuscript from a paper that was written by several of the grantees. I'm sure you'll be hearing more about all those different things that the programs have learned as we go through today's program.

Now I'd like to turn it over to Dr. Botto and Amy Nance from Utah. Don't forget to do star 7 to unmute your phones.

Lorenzo Botto: Hello. It's Lorenzo Botto from Utah. What I've been asked to do is to begin talking a little bit about the lessons learned from the Utah experience. I think there have been several and we try to condense these in the seven major ones.

Next slide. Since we are here from the West, we call these the Magnificent Seven, for those of you who are old enough like me to remember this movie. The subtitle is a full slide 700. Sometimes you already felt like that.

Next slide. The real Magnificent Seven are listed here and we'll go through one by one. We try to generate some general lessons, but we will try and provide some practical examples for each. We'll go quickly, seven lessons in seven minutes.

Next. The first, we only have to do with the initial phases for the planning. The key for us was to bring together a diverse team and really emphasize strong clinical input. No person has the skill sets that are necessary for this project. For us, it was really helpful to get not only the classic skill sets in [inaudible 00:05:28] and the data management, but in this case, it was particular helpful to get to people who are really crucial

in understanding the clinical processes, particularly the new born nursery, nurse managers and the clinical directors. As well as people in the pediatric cardiology world. I'd like to emphasize this at various points during the presentation, local champions within each of the nurseries.

Now the other side of this as we go to a previous is that we're such a diverse team. It was really important to provide a common sense of purpose. For this, it was crucial for us to mobilize a smaller core team that met regularly, at least once a month in person and more frequently through other means. The third point was, how crucial it was to listen to the trenches and to embrace the clinical input on what works and what needs fixing. The two sides for the pilot were, one, a university setting and the other was a large commercial hospital. Although the protocol was the same, the issues were slightly different.

The second lesson had to do with the planning. Here, we really needed both the tortoise and the hare. The goal was to plan slowly in order to be able to implement rapidly and to craft a step-wise approach which could minimize later changes and fixes. We put together the implementation phase in full steps. We had an initial warm-up period and then a first full phase. Then we did a mid-project assessment to see what needed to be fixed. In our case, we had also the issue with altitude and we wanted to make sure that we were not missing important lessons for the first phase.

Then after the assessment, we went on to the final phase. Also with this planning and with a small core group, we were really I'd say focused on being able to provide quick responses to arising issues, and these were several.

Next slide. Lesson number 3 expect obstacle even from unexpected places. These were technical issues, but also I think have been more basic issues with understanding. To somewhat of a surprise, we had significant challenges with the Department of Health IRB, which continue to require informed consent as if this was a research study. We weren't really sure how to solve that. It was really slowed only when the state bill came out that legislated a pilot as being required prior to statewide implementation. Then there were some technical challenges, such as we started right at the time when there was a switch in the electronic health record in one of the hospitals. That took away some of the IT focus that we would have needed. We sort of match through these things, but, yes, expect the obstacles.

Next one. Number 4 is really a crucial one. Educate, we know that, but also it's crucially important to reeducate. Here, because the reality has to

do both with the process and with the people, the screening as we all realized now is complex, is more complex that some of the other types of, say, newborn screening because it's an intensive point of care, as a screen. Also the people. The people change, they're in flux, and they forget. The real risk is significant process various all the time and also across sites, both in how the protocol is being followed as far as how the results are being documented.

The cure was really to develop and sustain some solid process of education and reeducation and, crucially, not only at startup but also during steady state operations. We tried a number of approaches. Amy will be speaking a little bit about that to what she did during statewide implementation. This included systematic education of nursing staff, the training of residents and attendants, and also I think the visual tools were quite helpful both in terms of the visual workflows as well as the use of stickers and a few other things. Keep calm and educate on was what really stuck with us.

Number 5 is keep it simple for the academics among us even if it hurts. For the pilot, we really wanted extensive auto sets to data because we have to deal with all the process as well as trying to figure out if you had to change things at altitude. There were challenges in the electronic data capture and transmission because of small but crucial discrepancies with the data or with missing data. For example, there were some failed screens in the electronic data capture, but these didn't quite fit with the summary reports. For the missing data, there were some cases that have failed first screen, but there were no data on the second screen. Bottom line, this required quite extensive hand curation, which in turn required quite a bit of time.

For the statewide implementation, the Department of Health went with the use of some simple birth certificate field such as pass, fail and not screened without, for example, the saturation data. This is also because there was no mandate for reporting or funding for monitoring. Keep it simple and if you [inaudible 00:12:52].

Number 6. It was important for us to keep our eyes on the prize with all of these changes in practice and with the decisions we had to make. The bottom line for us was, the pilot study was necessary, but really not sufficient to tell the whole story. We got some extremely valuable data on process, but I think we and others realized that for a full outcome assessment, we need more time and larger numbers. This is to get to important symmetries such as false positive rates, especially the false negative rates, the cases which are being missed, and also the changes in

mortality and mobility, which would provide a real clinical symmetric of the benefits of screening. It's important to follow the pilot with ongoing monitor in quality, controls. Also because we expect that the performance and benefits of screening would vary by geography, rural versus urban, for example, with practices such as the ability to detect CCHDs prenatally, and the time, things will change.

The practical issue here is that ongoing monitoring will require investment by the newborn screening process and buy-in from state stakeholders. It means time. It means [meet 00:14:38]. It means people. It means funds.

Last but not least, number 7, with all of the issues, it's important to keep the faith. We did not tattoo this on our arms. This is not new for Amy. I think we need to keep that level of commitment. This is because we should expect, and we did receive, initial skepticism and concerns from multiple. I think we and also some of you have heard things such, "This would cost too much. It will flood our tertiary centers with unnecessary echos. It will cause expensive transfers, longer newborn stays, and confused parents." During this 15-month pilot, I think these concerns were less than expected. I think also with initial data from the statewide implementation, these data do not seem to support in large [majority 00:15:53] these concerns.

At the same time, it was important to embrace the skepticism, because these questions turned out to be the real important ones for the stakeholders. It was important for us to focus our mind and really to explain [inaudible 00:16:08] officials. What was helpful for us was to invest in regular conversations with a broad-based advisory panel. This provided crucial transparency in the process. What was interesting at the end of the pilot as we went through this, the stakeholders and the advisory panel that expressed the initial skepticism, healthy skepticism, I might add, at our last advisory panel, they turned out to be the strong supporters for CCHD screening.

These were the Magnificent Seven.

Next slide. The most important I think lesson to us is we are always learning. In this regard, I would like to let Amy to take it from here to show us what we've learned as we moved from the small pilot to the statewide implementation. Thank you.

Amy Nance: Thanks, Lorenzo.

Thalia Wood: Thank you. Thank you. Amy, just to let you know, we probably need to wrap up your presentation in about five minutes.

Amy Nance: Okay. That's fine. Next slide. As Dr. Botto mentioned, during the 2013 legislative session, there was an amendment to the newborn infant task to include newborn screening. What it didn't mandate was the reporting requirement nor a requirement to monitor the screening. As a core team, we really did feel that this was an important aspect and, as such, needed to attempt to find funding.

During the 2014 legislative session, we were able to get an 80 cent newborn screening kit fee increase to fund monitoring education and quality improvement. While the law itself doesn't specifically state reporting requirements, we were able to ensure this in two ways, one by the birth defect reporting rule and then also through the addition of the question to the birth certificate.

Next slide please. As I stated, to ensure that, at a minimum, all babies were being screened. We added the field to the birth certificate, asking for the final result, pass, fail, not screened, which is being captured on the newborn worksheet. This is a mandatory field that must be filled in prior to submitting the birth certificate with one of the three options. We do know that not every baby is screened or that not every result will be put on the birth certificate because of timing issues, being that the birth certificate has to be within 10 days. We have built into our reports exclusion criteria. Deceased less than 24 hours, refused newborn screening, transfer to hospital NICU, heart defects listed on the birth certificate, or transferred to another facility.

While this effort is not as extensive as our pilot project data, it is a quick and easy mechanism to get at data which has the capability of giving us quite a bit of information. One big part was, during the pilot project, we did hear it needed to be somewhat easy for the hospital staff. We took that into consideration as well. This is a first good effort of trying to get as much data as possible.

Next slide please. This slide represents eight months' worth of clean data. When we receive the information, we review each case that is reported as a failed screen to ensure that a protocol was followed. I also sit in the birth defects program, so we are also monitoring the cases reported by the UBDN. Just to highlight a few areas on the screen. As with 33,531 babies born in Utah between October and May, we've had a little over 2,500 not screened. Once we institute the exclusion criteria, 609 had not been screened, with that largest part being the home birth. The overall

30,822 babies had a documented screening with a passing result of 99.8 passing the screen and 56 failing. Of those 56 failed screens, only 44 has had an echo performed.

The support, again, also shows the continued need to educate our home birth and birthing center populations about the screening. While this number has improved over the last several months, as Dr. Botto mentioned, educate and reeducate is definitely what we are trying to do.

Next slide please. This slide just gives a little more detail about the fails. We have found three primary targets, a TAPVR and two pulmonary atresias, the two secondary targets, and then 36 that had been caused by this other cardiac. Three that have not had a heart defect, but two of those babies were pretty sick and stayed in NICUs for several days, but no heart defect. Then there are 12 that we are still getting records on. As an initial step, none have been seen in our children's hospital and as far as we can tell have not received an echo for anything substantial.

We are in the beginning stages of working with researchers at the university to look at this data and the impact of the statewide implementation. There's definitely more to come.

Next slide please. This is just to show you a couple of our quick hand reports that we can get from the data that I have been showing you. This report is looking at hospitals, rural, urban and urban NICU hospitals looking all at the same data. That's this report.

Next slide. This report shows at looking at elevation of each of the hospitals.

Next slide please. Then this is by birth volume. These are some just one-quick reports that we can do looking at the data to really look and see if there are areas of concern.

Then just this last slide, next slide please. From this report, we can look at the not screened, activating inclusion criteria has been applied and see if there are hospitals in need of further education, training or follow-up. Just to explain. Yellow means that the hospital missed more than 5 percent of their births in that month. If they're yellow for three consecutive months, then I contact that facility and determine if there are training issues or needs that they need. The red means that they've missed more than 20 percent of their births. This would require immediate action. I call the facility and work with them to try to determine what needs they also need.

Next slide. Just want to thank you for letting Dr. Botto and myself present and have this opportunity to share what we're doing in Utah. I'll open up to question or if we need to move to the next presentation.

Thalia Wood: Thank you so much, Amy and Dr. Botto. We have time maybe for one question. If there's other questions, if you wouldn't mind typing them into the chat box and we'll get to them later if we have time. Does anybody have a question? If you do, just star 7 to unmute your phone.

Nobody has a question right now. Again, you can either ask it and we will have a chance to do it again, or you can type it into the chat box.

Dr. Hokanson, if you want to go ahead and start your presentation.

John Hokanson: Sure. Can you hear me?

Thalia Wood: I can. Thank you.

John Hokanson: Great. Thanks for letting me present some of this information. Most of what I'm going to say is going to reflect exactly what the Utah team just presented. Hopefully it's a supplement to their excellent presentation. I wanted to go over a couple of things very quickly if I can. Some of the challenges that we faced, some of the things that we attempted and had to change, some of the things that turned out to be better ideas than we thought they would, some of our preliminary data, and I'd like to explain why we're presenting preliminary data to this group. Then a few things that we did learn along the way.

If we could take a look at the next slide. Some of our challenges that we faced is that we have about 70,000 births per year. Those are spread across approximately 100 birthing hospitals, with about a half of those hospitals delivering less than one baby per day and no hospital in the state has ever delivered 4,000 babies in a year. On top of that, we had a 2 percent home birth rate with a huge number of individuals involved with that. We had a lot of people that we needed to train and a lot of potential variation the way the screening and reporting was performed. What we learned along the way also is that many of our home birth families were off the grid in respect to the public health system. Some of them didn't have birth reports of any kind and we learned more as we went along.

We can go on to the next slide. I don't know if you can see it. It's very small. This is the distribution of the home births across the state. They were roughly half plain clothes, which means the Amish Mennonite and

seminar communities and half English, as a plain clothes community we refer to. They were distributed all across the state as you could see by the scatter shot of these points. Again, our education efforts had to be spread quite extensively.

If we can go on to the next slide. One of the challenges that we face in Wisconsin that some other states might not face, but I suspect several would, is that when we baby fails their screening in one setting, they have to go to a different setting to have a definitive diagnosis made. In terms of tracking the data, this added significantly to the complexity. What we also know is that, about one in six babies born in Wisconsin will end up crossing a state line for their definitive diagnosis and their definitive treatment. Again, adding a level of complexity to the data collection.

We'll go on to the next slide. How we approach this was to focus primarily on the critical congenital heart disease. We treated the original seven primary diagnoses and the additional five diagnoses as equals in terms of their importance. We also, with the mechanisms we had in place, knew that we were collecting this data as a quality assurance proposal and we were not going to be a direct patient care safety link. We did not have any way of contacting a hospital provider in time to alert them of a failed screening or a missed screening and knew that we couldn't take on that responsibility. We also knew that it's important to be aware of the other diagnoses that can be diagnosed with pulse-oximetry screening, other causes of cyanosis, such as sepsis or lung disease, but we left that to a secondary evaluation. We also had a modification of the protocol that would allow a delay in the screening until the child was off supplemental oxygen.

We'll move on the next slide. Our data collection vehicle was a newborn blood spot card. That was all that was available to us. One of our priorities was we didn't want to compromise collection and delivery of the blood spots waiting for pulse-oximetry screening particularly for children that were on oxygen. Our low-tech solution to that was to ask hospitals and birth centers to photocopy the blood card and send the blood card in for processing and to later fill in that photocopy once the baby could be effectively screened. That's turned out to be quite effective. Like I said, low tech as it is, it's worked out quite well. We collected a basic data set on all the children with the blood card and collected expanded data using an infrastructure built on what had been formed for the newborn hearing screening.

For most of our study period, we were relying on voluntary reporting, which is incredibly challenging. Fortunately, last summer, we got a mandate both for screening and reporting, which helped us enormously.

We can go on to the next slide. This is a copy of our newborn blood card with a small piece of real estate dedicated to the pulse-oximetry screening. I'll focus on that on the next slide, please. This is the minimum data set we opted to collect on every baby in the state. We've expanded it slightly since initiation to include the date and time of collection, pass and fail, and then if the baby was not screen, the reason why the baby was not screened. Our hospital, in particular, were very interested in having this option left to them, as they didn't want to be seen as being out of compliance if they didn't perform the pulse-oximetry screening as recommended.

You can see there the reasons we allowed individuals to mark off why the baby had not been screened. If the family refused, that is certainly one. The screening and reporting requirement transfers with the baby if they moved from one facility to another. Obviously if a baby has died in the immediate newborn period, the screening is not appropriate, or if heart disease has been confirmed or excluded by echocardiography.

There are very rare other circumstances where the screening would be excluded. These would be situations such as a baby with anencephaly, where no treatment would be undertaken if heart disease were found. In that case, again, it doesn't pay to do the screening and reporting.

Go ahead please. We went on to collect and expand the data set on all babies who'd fail their pulse-oximetry screenings, all babies who had been admitted to one of the state's children's hospitals with a critical congenital heart disease. This turned out to be incredibly important, but also incredibly labor-intensive. We correlated this as well with state hospitalization and discharge records and death records, but there is no way to do that in real time and that was only at yearly summaries.

If we can go ahead to the next. There are certain weaknesses and challenges in this project. Obviously, we were dealing with hundreds if not thousands of different individuals who could all interpret the screening process, and it valued differently. There was a huge variation in the resources available, particularly for the assessment of a child who had failed their screening. Even for all of us who have become pulse-oximetry screening nerds, the Kemper protocol is a little tricky to keep ahead of. One of the things that we didn't think about ahead of time is just how difficult it would be for a facility that delivers very few babies to

keep in mind and to remember what to do in light of a failed pulse-oximetry screening if it doesn't happen for years and years.

We also learned that, as the Utah team had pointed out, the educational mission is never complete because, as soon as you think you've got any hospital or centers sorted out and running smoothly, someone will be promoted or transferred or retire, and you have to start all over again.

Let's move on to the next slide. We did try one thing, which we should now leave to the experts, which was an attempt to determine babies with prenatal and other diagnoses of congenital heart disease before screening, what their screening might have been. The reality is that that's a much more fluid measurement that you'd hope. Really, we'd limit ourselves now to only those children that had a proper screening where someone committed to the results. Unless you're in a very controlled research setting, I would not undertake something like this.

We move to the next slide. Initially, when we set up our plan, the idea would be that any hospital that had a baby that would fail would contact us straight away so that we could begin the collection of the expanded data set immediately. The reality is that, this almost never happened. The biggest problem would be again in those facilities where their screening failure would recur so infrequently it was impractical to think they could keep that mechanism up and running.

Now, whenever we receive a blood card with fail reported, that's immediately sent to one of our nurse coordinators who begins the process of collecting that expanded data set. We also began aggregate reporting of hospital screening results to the facilities and compared it to the state. What we found is that, hospitals uniformly believe they were screening, reporting more than 100 percent of all their babies. They never felt that they'd miss a baby. When we would send them a screening report that would say their reporting rate was 75 percent, it wasn't helpful to them unless we could also give them the list of children's names and birth dates so that they could go back into the record and see what was going on. They were in the process of revising our QA system to allow the hospital to access not just to their aggregate numbers, but to their baby level numbers as well.

Let me go on to the next. We had the exceptionally good fortune of getting the Wisconsin Guild of Midwives involved very early on. Particularly, Gretchen Spicer did a spectacular job of introducing the pulse-oximetry screening to the home birth community and to the plain clothes community, and built an idea that newborn screening was a triple

threat. It was a coordination between blood, hearing, and congenital heart disease screening. Those three together made an incredible impression on the community and now we're getting better results for all three because of this effort. The result is that, there are a lot of births now that we have data on or that we're aware of that were really off the map before all this started.

Next slide please. Very simplistic things. We switched from the conventional epidemiologic terms of positive and negative screening and simply used pass and fail. We were finding individuals getting hung up on these positive and negative. Negative screening being a good thing and a positive screening being a bad thing was a little hard to get around. One thing that, particularly, our midwives admitted to finding very helpful and I suspect all of our hospital colleagues would agree was very helpful was distributing a grid similar to the one developed by the Virginia team to help decode the Kemper protocol. One of the buzzwords we used was two sites and three strikes, meaning pre and postductal saturations with as many chances as three to get pass. Again, it was very important to our providers to allow documentation of why pulse-oximetry was appropriately not performed.

We'll go on to the next slide. This is similar to what the Virginia team put together and our providers found it incredibly helpful, as again the Kemper protocol is complex even for those of us that have been looking at it for years.

We'll go on to the next slide. Now, I have some of our preliminary information and I usually would not want to present preliminary information. Unfortunately, one of the challenges, one of the boulders that fell on to our road was, within the last three weeks, we've realized a major data collection error. Now, I think we can still draw some important information from our preliminary data. That's my justification for showing it for you today.

This is our voluntary reporting of 63,000 births. We received results on only 55,000 of them. Again, if you'd go to the hospitals, all of them would say they're always reporting every baby. We focus only on critical congenital heart disease. Our failure rate was about 1 in 900. This is similar to what Utah has presented just now. I suspect our lower failure rate has to do with our lower altitude. We also saw that the failure rate was higher in the home birth community than in the hospital-born community. The positive predictive value for this small sample was only 11 percent. I think what you have to remember in comparing to the earlier data is that, the prenatal detection rate means everything.

In Granelli's initial study from Sweden, the prenatal detection rate, if I remembered correctly, was in the single-digit percentage rates. The higher your prenatal detection rate, the lower your positive predictive value. There will be just as many false positives, but fewer and fewer true positives. The main problem with the preliminary data that I'm going to be showing is that our prenatal detection babies are underrepresented in this analysis.

Go ahead to the next slide. If you look at that 63,000, we had that 0.1 percent failure rate and only 11 percent of those that failed had critical congenital heart disease. We had 14 babies that passed their screening and would later be found to have critical congenital heart disease and quite a few that were not screened. Again, this data is not complete and does not include the prenatal detected babies' incompleteness and there certainly could still be babies who were false negatives that haven't been identified yet.

We'll move on to the next slide. In that subgroup of 38 babies where we did have the mechanism of diagnosis, five of those babies were identified for the first time with pulse-oximetry screening. This is I think the data that we can take to say, even at preliminary stage validates the use of this screening. In that 63,000 babies, we had five babies who were first identified with significant congenital heart disease by the pulse-oximetry screening alone. Could those babies have been identified on other means later on? Certainly. Does it definitely mean that their clinical care was altered because of the pulse-oximetry screening? We don't know that. There's no way to know that. This is the way that it was first identified in these five babies.

For those of you that are looking at the diagnosis, the last baby on that list had an aortopulmonary window. We've included them as critical congenital heart disease because they also required an aortic arch reconstruction and would fit into the category of aortic arch obstructions like a coarctation.

We can go on to the next slide. The babies that have false negatives in the second column, that's dominated by coarctation of the aorta. Half of our false negative were isolated coarctations of the aorta with the additional baby with a coarctation and ventricular septal defect.

Let's go on to the next one. Of the babies with congenital heart disease that were not screened, most of these were because of a prenatal diagnoses, some of them because of physical diagnosis after birth, but

before screening, and one child that actually got into clinical trouble before pulse-oximetry screening was performed.

Move on to the next slide. A few thoughts from the project. We felt that our role should be one of quality assurance and did not have the resources to provide an immediate safety net for clinical care. Our job was much harder before we had a state mandate for both screening and reporting. Even with those state mandates, it's still an enormous amount of work.

As we move forward, however, even with great prenatal detection rate, I think that pulse-oximetry screening is still detecting babies that might otherwise be missed. We rely heavily and extensively on our nurse coordinators and couldn't get by without them, in part because we're constantly educating and reeducating our partnering providers. We've also learned that the hospitals and the midwives need a patient-level quality assurance report, not just the aggregate numbers.

I think I'll stop there and hopefully we can- [crosstalk 00:42:34]

Thalia Wood: I'd like to encourage the audience that's on the phone to think about submitting an abstract to the Newborn Screening and Genetic Testing Symposium on CCHD. We will have a whole track on there at the symposium. Please, I want to encourage you to submit an abstract if you have some information you'd like to share.

Now, are there any questions for our presenters today?

Lisa Hom: Monica and Thalia, this is Lisa at Children's National. I just wanted to comment. This is somewhat a question, but Monica, you're perfectly set up, the topic of our next webinar in October. Dr. Matt Oster has actually been looking at individual pre and postductal sats and looking at the impact of variation on the algorithm on false positive and detection rate. The evaluation of screening algorithms and really drilling into those rates and how it impacts the outcomes is actually the topic of our next webinar. Thank you for putting on your NewSTEPs slide.

Thalia Wood: Thank you, Lisa. That was a great segue. Does anybody on the call have a question for any of our presenters? If not, I don't hear anything, I don't see anything in the chat box, I would again like to thank all of our presenters. Thank you, Dr. McClain for having us end on time. Again, I encourage the listening audience to submit abstracts to the symposium that will be in St. Louis, February 29th through March 3rd of next year.

We hope that you'll submit some abstracts and we'll have a great conversation there about CCHD as well.

As Lisa said, our next webinar will be in October and more information will come out on that on the ListServ. Anything you want to say at the end here?

Lisa Hom: No. Thank you very much, everyone, for attending this webinar this afternoon and thanks so much to our speakers. I think we all learned a lot about some common barriers and some individual solutions. Thank you very much. This is excellent.

Thalia Wood: Thank you.