The Advisory Committee on

Heritable Disorders in Newborns and Children

Virtual Meeting

10:00 a.m.

Friday, May 13, 2022

Attended Via Webinar

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C O N T E N T S

P R O C E E D I N G S

WELCOME, ROLL CALL, AND COMMITTEE BUSINESS

CYNTHIA POWELL: Good morning, everyone. Welcome to the second day of the May 2022 meeting of the Advisory Committee on Heritable Disorders in Newborns and Children. I'm Dr. Cynthia Powell, Committee Chair.

We will begin with the roll call. Committee member representing the Agency for Healthcare Research and Quality, Kamila Mistry. She may not be available today. Kyle Brothers. And Kyle was also likely going to be a little late in joining us this morning. From the Centers for Disease Control and Prevention, Carla Cuthbert.

CARLA CUTHBERT: I'm here.

JANE DELUCA: Here.

CYNTHIA POWELL: From the Food and Drug Administration, Kellie Kelm.

KELLIE KELM: Here.

CYNTHIA POWELL: From Health

Resources and Services Administration, Michael Warren.

MICHAEL WARREN: Here.

CYNTHIA POWELL: Shawn McCandless.

SHAWN MCCANDLESS: Here.

CYNTHIA POWELL: Jennifer Kwon.

JENNIFER KWON: Here.

CYNTHIA POWELL: From the National Institutes of Health, Melissa Parisi.

MELISSA PARISI: Here.

CYNTHIA POWELL: Chanika Phornphutkul.

CHANIKA PHORNPHUTKUL: Here.

CYNTHIA POWELL: I'm here, Cynthia Powell, and Scott Shone.

SCOTT SHONE: Here.

CYNTHIA POWELL: And our organizational representatives from the American Academy of Family Physicians, Robert Ostrander.

ROBERT OSTRANDER: Here.

CYNTHIA POWELL: From the American Academy of Pediatrics, Debra Freedenberg.

DEBRA FREEDENBERG: I'm here.

CYNTHIA POWELL: From the American College of Medical Genetics and Genomics, Maximilian Muenke.

MAXIMILIAN MUENKE: I'm here.

CYNTHIA POWELL: From the American College of Obstetricians and Gynecologists, Stephen Ralston. From the Association of Public Health Laboratories, Susan Tanksley.

SUSAN TANKSLEY: I'm here.

CYNTHIA POWELL: From the Association of Women's Health Obstetric and Neonatal Nurses, Katie Swinyer.

KATIE SWINYER: Here.

CYNTHIA POWELL: From the Child Neurology Society, Margie Ream.

MARGIE REAM: Here.

CYNTHIA POWELL: From the Department of Defense, Jacob Hogue.

JACOB HOGUE: Here.

CYNTHIA POWELL: From the Genetic Alliance, Natasha Bonhomme.

NATASHA BONHOMME: Here.

CYNTHIA POWELL: From the March of Dimes, Siobhan Dolan.

SIOBHAN DOLAN: Here.

CYNTHIA POWELL: From the National Society of Genetic Counselors, Cate Walsh Vockley.

CATE WALSH VOCKLEY: I'm here.

CYNTHIA POWELL: And from the Society of Inherited Metabolic Disorders, Gerard Berry.

GERARD BERRY: Here.

CYNTHIA POWELL: Thank you. I'll now turn things over to Soohyun.

SOOHYUN KIM: Thank you, Dr. Powell. So, as Dr. Powell mentioned yesterday, this is her last meeting as the Chair. So, we wanted to take some time before we start today to honor Dr. Powell for her service and many contributions to the Committee. Next slide.

First, we have Dr. Warren, the Associate Administrator for the Maternal and

Child Health Bureau and an ex-officio member of the Committee who will say a few words.

MICHAEL WARREN: Good morning, everyone. Thank you so much for the opportunity to share some comments.

As Dr. Powell mentioned yesterday, this is her last meeting and so on behalf of the Health Resources and Services Administration and the United States Department of Health and Human Services, Dr. Powell, we want to honor and thank you for your leadership and for your service to the Committee and to the field of newborn screening more broadly.

For those who may not know, Dr. Powell has served on the Committee as a voting member since November of 2017 and as the chairperson since May 2019.

As a highly regarded and well-known pediatric geneticist with a focus on hearing loss, genetic and chromosomal syndromes, and ethical issues in genetics and newborn screening, she's brought her extensive clinical and public

health expertise in newborn screening and heritable disorders to enrich Committee deliberations and made evidence-driven recommendations to advance newborn screening systems.

Under her leadership, the Committee has reviewed and strengthened its evidence-based review and decision-making processes and developed consumer-friendly resources explaining these processes.

The Committee is also focused on the newborn screening workforce and the challenges and opportunities therein.

Importantly, under her steadfast leadership, the Committee is looking at health equity and newborn screening and follow up and reviewing the Committee's capacity and prioritization of nominated conditions. This work will extend beyond her time as chair.

Dr. Powell, HRSA would like to sincerely thank you for your leadership, your thoughtfulness, your wisdom, and your lifelong

dedication for infants, children, and their families. You've truly made a lasting positive impact in their lives.

I think about the 4 million or so infants born every year in this country and your work impacts every single one of them and their families, and while many of them will never know your name, they are better off because of your service. So, we thank you.

CYNTHIA POWELL: Thank you, Dr. Warren. It's really been an honor and privilege to work with you and others at HRSA over the last several years, particularly during my time as chairperson. I wouldn't have been able to do this without the support of the group at HRSA. I would like to particularly thank Soohyun Kim, who's been the Designated Federal Official for the last few months and also previous Designated Federal Officials I've been able to work with, Mia Morrison, Catherine Riley, also Debbie Sarkar. Her long-term history with HRSA and her institutional memory has been a vital importance.

Also, Alisha Kheen and Joan Scott.

I'd also like to thank my predecessor chairs of the Committee, Dr. Rod Howell and Dr. Joseph Bocchini, who often offered their advice and support to me.

As we move forward, I certainly think this is an extremely exciting time for this Committee and newborn screening in general. We've gone through a very trying last two and a half years, and those of us who have lost close family members, friends, coworkers, you know, and seeing just what's happened to our country during the pandemic, but despite all this, the fact that the newborn screening program and system has run as smoothly as it has is really remarkable, I think, and despite the lack of funding and burnout for many individuals in the system, there are so many dedicated people across the newborn screening system, and we need to honor them and make sure that, you know, they -- they continue their -- their very important work.

I hope that the Newborn Screening

Saves Lives Act will be able to be passed in the near future, and also that the Committee can continue working on several of the issues with interoperability that we've talked about. We need to be able to harness our amazing electronic health records and other informational systems to communicate with each other to improve the lives of children identified with conditions through newborn screening.

We will continue to think about workforce shortages and also being able to track long-term outcomes, especially as we add some of the newer conditions that are going to require a lot of follow up. So, again, I'd like to thank all of you and I will be around for a few more weeks working with the Committee and if Soohyun does that have any additional comments, or she'll let me know when we can introduce our new Chair of this Committee, thank you.

SOOHYUN KIM: Thank you, Dr. Powell. And personally, it has been such a tremendous pleasure and privilege to work with you and to

work with the Committee under your leadership.

Because we were unable to honor you in person today, we have mailed our appreciation plaque and if you have it nearby, if you want to share it with everyone. And we also have -- thank you -- shared virtual thank you card with her this morning with messages from current and former members of the Committee, and many of our colleagues and partners. We'll also be sending a certificate and letter of appreciation from our HRSA Administrator, Carol Johnson, soon.

So now, I actually would like to open the floor to the fellow Committee members, if they would like to share any words. Dr. McCandless.

SHAWN MCCANDLESS: It's always a race between Scott Shone and me and need to see who's going to get our hand up first and I apologize for that.

Cindy, I just want to thank you for your -- for your gentle approach and your wisdom that you've shown us and the leadership you've

shown. Some of you may know that Cindy was one of my partners in my very first job at the University of North Carolina and I learned so much from Cindy and Art Ellsworth and the others there, Diane Frasier, about how to be a good physician and how to be a good person and how to be really thoughtful and care about my patients and it's really been terrific for me to see how Cindy has brought that to the Committee.

So, Cindy, thank you for your leadership and, frankly, thank you personally for everything you've done for me through my entire professional career. It's -- it's -- you've been a good friend and a good mentor, so thank you.

CYNTHIA POWELL: Thank you, Shawn.

SOOHYUN KIM: Thank you. Dr. Shone.

SCOTT SHONE: Shawn, you can win every race to the hand raising from now on. I will not compete anymore.

But, I guess, so Cindy, first thank you for what you've done for Shawn because I love working with him too, but so clearly a wonderful

mentor. For me personally, I am thrilled that we have you in North Carolina. I don't know if it was planned to get both of us North Carolinians off in the same term, but I am thrilled that -- that I get to continue to work with you personally on improving the lives here of the babies in North Carolina. Thank you for all that you do here locally within our state but also just the patience and grace that you have shown personally. We joke about this, but I've learned so much in the short time I've been in North Carolina through our work with pilot studies to now mandated newborn screening, and I appreciate everything you've done on the Committee.

It hasn't been the easiest times, even without a respiratory pandemic. These are challenging times for the newborn screening system, and I think you've helped us navigate it quite well, and I look forward to our continued partnership. So, thanks, Cindy.

CYNTHIA POWELL: Thank you, Scott.

SOOHYUN KIM: Dr. DeLuca.

JANE DELUCA: Hi, Cindy. I think we both came on board at the same time for the Committee or actually during your leadership role, for me to become a member of the Committee, you know, I think we were both scared. But I, too, appreciate gentle wisdom and your intelligence in terms of your approach to Committee matters. But we're neighbors. You're North Carolina, I'm South Carolina. I think I'm going to see you later in July at SERGG. So, I look forward to see you there, and hopefully we can step out and have a drink. Thank you.

CYNTHIA POWELL: Thank you, Jane.

SOOHYUN KIM: I'll also open the floor to our organizational representatives. Dr. Muenke.

MAXIMILIAN MUENKE: This comes slightly unprepared. So, I'll talk from the heart and I think of Cindy Powell of Dr. Cynthia Powell, I think service and professionalism is written all over her. And just to mention a few, she has been -- she has served in education as a

role model there really working on the next leaders in the field, training so many at UNC Chapel Hill. She has been the President of APHMG, the Association of Professors of Human -- of Medical or Human Genetics. She is on the board of directors of ACMG, the organization where I'm the CEO of. She is -- for us, she is the Chair of the Development -- for the Workforce Development and Innovation Committee because, as you all know, we don't have enough geneticists around.

On top of it, she comes from a somewhat different route, although she's not the only one, she started out as a genetics counselor and I think her tender approach and not letting go, fighting on behalf of patients, I think that to me is -- she has been a role model for me all along.

It's hard to pinpoint when Cindy and I first met. It's a while ago. I would venture to say, maybe two decades, I don't know. We didn't meet when you worked as a genetic

counselor here in DC because at the time I was in Philadelphia, but your gentle approach and not letting go as in fighting for what's right on behalf of patients, on behalf of trainees, that is a role model for me and always will be. Thank you, Cindy.

CYNTHIA POWELL: Thank you, Max.

SOOHYUN KIM: Thank you, Max. Robert Ostrander.

ROBERT OSTRANDER: Yeah. Hi, Dr. Powell. I can't say enough how much I appreciate the way you have run these meetings through these very difficult times, calmly, in an organized way, and firmly.

The other comment I want to make and it applies to you, but it applies to this group at large, sitting on this panel as a family physician who isn't even really an academic family physician, I do have my rural medicine teaching from a small practice, sitting on a panel like this could be intimidating, it would be very easy for you and others to be, you know,

rather dismissive of a non-subject matter expert who really is just a country doctor. But it's never been that way. I've always felt incredibly respected as an equal and it takes the right hand leadership to make that happen and have these conversations.

So, again, on my own behalf, and on behalf of the Academy of family physicians, I can't say enough how impressed and how much I appreciate your leadership.

CYNTHIA POWELL: Thank you, Bob.

SOOHYUN KIM: Natasha Bonhomme.

NATASHA BONHOMME: Thank you. I just wanted to take a few seconds to say -- to echo what everyone has said and really, you know, what I really appreciate about you, Dr. Powell, is always your willingness and your availability to speak to advocacy organizations and families who are learning and making a great positive impact in this space.

I think anytime I've asked you, even if you've done everything you could to shift your

schedule around and to send any information if you couldn't be there in either in person or virtually, and I really appreciate that. It really does mean a lot and it makes a difference when people can say, oh wow, the Chair of this critical Committee is willing to talk to me as a parent or to me as an advocacy leader. So, I just really appreciate that and look forward to working with you in the future.

CYNTHIA POWELL: Definitely. Thank you, Natasha.

SOOHYUN KIM: Debra Freedenberg.

DEBRA FREEDENBERG: Hi, Cindy. I'm going to echo most of what other people have said. But what I'd also like to thank you for is your leadership, and not just as part of the Committee, but overall, in the field of medical genetics and your thoughts and approach to leadership, always thinking about patients, and always trying to improve the system, not just for one individual, but working to impact the whole country basically.

So, we've known each other for a number of years and it's been my pleasure to watch your leadership and watch and learn from you, and so thank you for the work you've done.

CYNTHIA POWELL: Thanks, Debbie.

SOOHYUN KIM: Gerard Berry.

GERARD BERRY: Yes. Cindy, we've been friends for a long time, but I've only been on the Committee for a few sessions now. But I'm just amazed at how you're able to handle and with your beautiful approach to make everyone feel comfortable and yet to get so much done, that it's been a real pleasure for being here and working with you. And I also want to thank you for everything you've done for the -- for the SIMD Society and all the planning, how you helped with the programs in the past. So, I know everyone will miss you.

CYNTHIA POWELL: Thanks, Jerry.

SOOHYUN KIM: Alex Kemper.

ALEX KEMPER: So, Cindy, I'd just like to reflect a couple things from my time

working with you and the Evidence Review Group. First of all, one of the things that's really impressive to me is that you really keep patients and family health outcomes as your North Star. You're really focused on doing those things that improve the health and well-being of everyone, and I think that that's really impressive.

The second thing is your role with the Advisory Committee is a voluntary one and I just want to make sure that everyone recognizes the frequency with which the two of us and the rest of our group meets to make sure that we're doing those things that ultimately help the Advisory Committee make the right decision and, you know, other people will talk about your quiet leadership and it just makes me think of the Mark Twain quote: There are basically two types of people. People who accomplish things and people who claim to accomplish things. The first group is less crowded, and you clearly are in that first group. So, just with a thank you.

CYNTHIA POWELL: Thank you, Alex.

SOOHYUN KIM: Thank you so much, everyone, and again Dr. Powell, thank you again for your service. And with that, I will turn it back to you.

CYNTHIA POWELL: Thank you and thank you to all the Committee members and organizational representatives who also donate all of your time and they're so important to the success and the workings of this Committee.

Well, I'd now like to announce that Dr. Ned Calonge will be the incoming Chair. Dr. Calonge is an Associate Professor of Family Medicine at the University of Colorado School of Medicine and Associate Professor of Epidemiology at the Colorado School of Public Health.

Recently, he stepped down as the President and CEO of the Colorado Trust, a private health grant making -- private health grant-making foundation. Prior to that, he was the Chief Medical Officer for the Colorado Department of Public Health and Environment.

Nationally, Dr. Calonge chairs both

the Community Preventive Services Task Force for the Centers for Disease Control and Prevention and the board on Population Health and Public Health Practice for the National Academy of Medicine, Health, and Medicine Division.

In the past, he chaired other evidence-based recommendation groups, including the US Preventive Services Task Force and the CDC's Evaluating Genomic Applications for Practice and Prevention Workgroup.

He was also a member of this Advisory Committee on Heritable Disorders in Newborns and Children from 2009 through 2011.

He has MD from the University of Colorado School of Medicine and an MPH in Epidemiology from the University of Washington School of Public and Community Medicine.

Dr. Calonge will officially chair the Committee starting at the next meeting, but he was able to join us this morning. Welcome, I would like to open the floor to Dr. Calonge to say a few words.

NED CALONGE: Thanks, Dr. Powell. Well, I am both blessed and intimidated by following in the footsteps of Dr Powell. I think, where you brought the Committee to and how things are working now and the direction is so rewarding and so excellent and in such good shape. But then I heard that I'm following a leader who's gentle, wise, intelligent, and quiet. I'm not sure I have any of those attributes, but I will aspire to them, I promise you.

I was listening to Dr. Ostrander and I remember my dad, who was a rural family doc, who would start talking in a room and the way he would put people at ease would be to sit back, loosen his tie, and say well, I'm just a simple country doctor. So, I thought I should be able to emulate that and when I start talking to groups, just sit back, take my tie off, and say I'm just a simple clinical epidemiologist. And it just doesn't always seem to have the same impact.

But I'm not a pediatrician, I'm not a newborn screening expert. I am a methodologist in evidence-based synthesis and recommendations. And Dr. Kemper and I and others worked on the -- to bring you the methods that you still use today, the matrix.

Dr. Jelili and I and Alex worked on the extension for readiness and feasibility. So, I'm well versed in those methods and every group that Dr. Powell talked about, I've been very active in creating the methodology for those translations.

Since then, I've gone on to work on methodology for Public Health Emergency Preparedness and Response recommendations and actually Alex and I have been working on environmental exposures with the National Academy, and that -- that experience is noteworthy because we -- our study committee on PFOS, which is environmental contaminants. It was the very first time that the National Academies used the town hall format to get in-

depth input from communities and individuals actually impacted by exposure to this environmental toxin. So, I have a real strong feeling around engagement at advocacy. I think the challenge of a Committee like the Advisory Committee is finding the right interface between advocacy, expertise, and evidence and I will tell you that I think the way we keep active and we keep relevant and people listen to us is to have a rigorous approach to using methods consistently across different topics.

I remember when we added SCID to the RUSP during my first time with the Committee and I had a friend in the evidence-based world call me up and say really? And the great part about it was that we had the methods and evidence review to be able to say, absolutely, we know that the benefits will outweigh any risks and that this intervention is going to save lives and that kind of -- the USPSTF used to call it bulletproof recommendation. What they meant is that you can't assail it on the basis of science

and I think that's a very important thing for us to keep in mind as we move forward in adding conditions to the RUSP.

I think the other thing is to make sure we pay attention to what you talked about a lot yesterday, which is implementation because adding a condition to the RUSP is really only the start, and it means nothing if it's not implemented, implemented systematically, implemented well and with the follow up that's necessary. And as everyone talked about, we're working with a non-system of 50 or more different state laboratories, different approaches, and different legislature.

So, I was in Colorado when the state lab director and I brought in tandem mass. We were using the university lab and then we brought it into the state lab and had to convince the legislature that the cost of these machines and the addition of this to the state laboratory was going to be good for the people of Colorado. This is in a -- in a tax limitation state where

any spending is difficult.

So, I think keeping implementation in mind, evidence in mind, and that interface with advocacy and expert opinion is just a really important fine line that the Committee has to walk.

This is my -- I've just finished my fourth career. I started in academic family medicine, then did preventive medicine for Kaiser Permanente, then was the Chief Medical Officer for the state of Colorado, and then spent the last eleven years pursuing health equity through philanthropy for the state of Colorado.

I was really pleased, Dr. Powell, to hear about the emphasis on equity moving forward. This is an area of passion of mine and something that I think the entire Committee needs to keep in mind as we move forward. We want to make sure we have recommendations that improve equity and don't unintentionally create new inequities.

So, I wanted you to kind of know my area of focus, my areas of passion, my past, how

humbled I am to be in this role, and to follow Dr. Powell, and how much I'm looking forward to working with the Committee and the advocates and the groups that are represented around the table, not to mention a fantastic staff who've already made the transition so easy for me. So, thanks to you all and I can't wait to get started.

CYNTHIA POWELL: Thank you, Dr. Calonge. Speaking on behalf of the Committee members, we're very happy that you're willing to step into this position, and as I pass the proverbial gavel to you, I know I leave the Committee in excellent hands, and thank you, again.

All right. Before I review the plan for today, I'd like to announce the upcoming Public Health Genetics Week that will take place from May 23rd to 27th. The HRSA-funded National Coordinating Center for the Regional Genetics Network hosts Public Health Genetics Week to increase awareness and celebrate the efforts of the Public Health Genetics System. To celebrate

the week, there are daily themes that focus on different aspects of the Public Health Genetics System.

I'd like to highlight the day four, May 26th theme, which is Public Health Screening and will highlight the newborn screening system. For more information on all the events and resources, please visit their website at www.phgw.org. Next slide, please.

Today, we begin with the second public comments period. We will hear from Niki Armstrong from Parent Project Muscular Dystrophy, from Richard Poulin from Special Education Teaching and Learning, Inc. We will also hear from individuals who will provide public comments on the Committee vote on Krabbe disease including Jacque Waggoner, Natasha Spencer, Karlita Blackwell, Joanne Kurtzberg, and Dieter Matern.

Then, we will hear from the Nomination and Prioritization Workgroup who will give a summary of the nomination package for Krabbe disease.

Following the presentation, the Committee will have an opportunity to discuss the nomination package and hold a vote on whether or not to move Krabbe disease forward to full Evidence-Based review.

After a brief break, the Committee will receive a presentation on the Newborn Screening Family Education Program.

We plan to adjourn the meeting at 12:40 p.m. Eastern time. I'll now turn things over to Soohyun.

SOOHYUN KIM: Thank you, Dr. Powell. I will briefly review the guidance for participating in this virtual meeting. Members of the public, please make sure to have your computer speakers turned on, as audio will come through them. If you cannot access audio from your computer, you can dial into the meeting using the telephone number in the e-mail with your Zoom link.

Committee members and org reps, audio will come from your computer speakers and

you'll be able to speak using your computer microphone. If you can't access through your computer, you can dial into the meeting using the number in the e-mail with your user-specific Zoom link that you received this morning.

Please remember to speak clearly and state your full name to ensure proper recording. For discussions, the Chair will call the Committee members and then organizational representatives.

Please use the raise hand feature when you would like to make comments or ask questions. You can click on the participant icon and choose raise hand. This feature may be in a different location depending on your device or operating system. If you're having trouble, please consult the webinar instructions page in your briefing book. Next slide, please.

As a reminder, to enable closed captioning, please select the closed captioning icon on your Zoom taskbar and once the menu appears, select show subtitles.

I will turn it back over to Dr. Powell.

PUBLIC COMMENTS

CYNTHIA POWELL: Thank you. In today's public comment session, we will hear from seven individuals who have requested to provide oral public comments. As mentioned yesterday, some of the speakers also provided a written version of their public comments, which the Committee received prior to the meeting.

We'll first hear from Niki Armstrong.

MEETING OPERATOR: We're working on promoting Niki. It will just take a moment.

NIKI ARMSTRONG: Hello, can you hear me?

CYNTHIA POWELL: Yes.

NIKI ARMSTRONG: Hello?

CYNTHIA POWELL: Yes, we can hear you. Can you hear us? We can hear you. Now we can't hear you. We can hear you.

NIKI ARMSTRONG: Okay. How about

now?

CYNTHIA POWELL: Yes. Now, we can hear you.

NIKI ARMSTRONG: Apologies. With the cut over to being the panelist, I seem to have lost all my sound, which was working fine earlier. So, my apologies for that.

CYNTHIA POWELL: Okay.

NIKI ARMSTRONG: Hi. My name is Niki Armstrong. I'm speaking today on behalf of Parent Project Muscular Dystrophy and the Duchenne patient community. Thank you for the opportunity.

I serve as the Newborn Screening Program Manager for PPMD, and I am pleased to provide an update about our Duchenne newborn screening efforts. We are thrilled to announce our RUSP nomination package will be submitted later this quarter.

PPMD has been working for more than ten years to develop the infrastructure needed for newborn screening in Duchenne. This includes

our successful two-year pilot in New York state, which was completed last fall. In that pilot, more than 36,000 babies in New York state had newborn screening for Duchenne. We identified four boys with Duchenne or Becker and one carrier female. The incidence of four boys out of about 18,000 male birth is consistent with past research showing an incidence of about 1 in 5000 males.

At least one state is initiating steps to consider adding Duchenne to their newborn screening panel and two other pilot programs, including the RTI Early Check DMD Pilot in North Carolina and the Cure Duchenne Brigham Women's Hospital Supplemental DMD Newborn Screening Program are currently ongoing in the US.

Each program is slightly different, which increases the depth of our Duchenne newborn screening knowledge and demonstrates that Duchenne newborn screening can work in diverse states.

The learnings from all these efforts are nearly compiled into the RUSP nomination package, which you will be considering in the near future. As you know, this is a monumental effort for advocacy groups and our disease community.

We remain focused on removing the diagnostic odyssey and changing the journey for how children with Duchenne are diagnosed. No more families going through a two-year or longer diagnostic odyssey. Instead, we foresee babies identified on newborn screening with Duchenne or Becker receiving expert clinician follow-up, initiating approved therapies when they will provide maximum benefit, participating in clinical trials without fear of aging out, and enrolling in early intervention therapy services during those critical early years. Only then can we truly support these families in our community from the beginning.

Today, we would like to extend our gratitude to all of the families, experts, and

partners who have helped us get this far. So many people have worked on this effort.

With five approved therapies and a research pipeline filled with potential therapeutic interventions, newborn screening will provide optimal opportunities for care and treatment in Duchenne. Thank you.

CYNTHIA POWELL: Thank you. We'll now go to Jacque Waggoner.

JACQUE WAGGONER: Hello, can you hear me?

CYNTHIA POWELL: Yes. Thank you.

JACQUE WAGGONER: Good morning. I am Jacque Waggoner, the CEO of the Hunter's Hope Foundation. Hunter's Hope was co-founded by my daughter Jill and her husband Jim Kelly in 1997 shortly after my grandson Hunter was diagnosed with Krabbe disease.

When Hunter was diagnosed, I quit my job to help my daughter with his constant care. I know firsthand the devastation of this disease on the affected child and on the entire family.

My heart breaks over and over again every time I learn of this symptomatic diagnosis of another precious child. I know too well what their future holds.

Hunter was a seemingly healthy baby at birth, but soon became inconsolable. He spent most of his waking hours screaming and was misdiagnosed with formula issues, failure to thrive, and CP. At four months old, because Hunter's health continued to decline, he was tested for leukodystrophy and our worst nightmare came true.

On June 23, 1997, after three long painful months of trying to figure out what was wrong with Hunter, he was diagnosed with Krabbe disease. We were told to take him home and make him comfortable and wait and watch him die and that he would most likely die by his first birthday.

Although Hunter had an entire team of experts helping to provide him with exceptional care, he suffered tremendously.

Hunter never spoke a word, yet he was able to communicate. He blinked once for yes and three times for I love you.

Hunter exemplified courage and toughness as he defied medical prognosis by living a valiant eight and a half years.

Since 2009, when this Committee last reviewed Krabbe and voted against its inclusion on the RUSP at a vote of 8 to 7, we know of 136 children who have been born in the United States and symptomatically diagnosed with Krabbe disease, too late for disease-altering treatment.

Because of this tremendous need, we have continued to tirelessly advocate for Krabbe newborn screening by partnering with families across the United States. We've also partnered with a team of experts to make continual improvements to Krabbe newborn screening and to fill the gaps that this Committee identified in its first review of the disease.

It is only with a clear view of this dreadful disease that that one can fully

understand the immense hope of newborn screening for Krabbe.

The difference between symptomatically diagnosed children with Krabbe and Krabbe newborn screening children who have undergone transplant is astounding. These children speak and laugh, they play, they go to school and most importantly, they are alive.

For Krabbe, newborn screening is a matter of life or death. With it, children have the chance for disease-altering treatment. Without it, children will suffer a painful and certain death.

We need your help to ensure that every child with Krabbe has the opportunity to live the best life possible. Thank you.

CYNTHIA POWELL: Thank you. We'll next hear from Natasha Spencer.

NATASHA SPENCER: Good morning, everyone. My name is Natasha Spencer, and I live in Chicago Illinois. In 2011, our son Keenan Witczak was diagnosed at the age of 8 months with

early infantile Krabbe disease. Because he was symptomatically diagnosed, rather than being identified through newborn screening, we missed our opportunity to intervene with the stem cell transplant.

The first two years of Keenan's life were riddled with rapid neurological deterioration, including painful muscle spasms, excruciating nerve pain, and an inconsolable irritability in the form of a high-pitched scream caused by the swelling of his brain, as the myelin of his white matter deteriorated.

The somatic damage that followed was extensive. Keenan lost the tone in his muscles and the ability to move his body voluntarily, including his smile. He lost this function to swallow and was fitted with a G-tube for nourishment. He lost the means to vocalize before forming his first words. His pupils stopped dilating according to light in room blowing out his vision. Kennan was just beginning to understand the world around him when

one by one, Krabbe disease shut his senses down.

The most troubling symptom was his respiration rate. He went from a toddler's average of 20 to 30 breaths per minute to 4 to 8 breaths per minute, while still maintaining his oxygen levels near 100%. His body had an amazing ability to physiologically adapt and compensate until it no longer could.

Looking back at a tight regime of around-the-clock medications and feedings, the daily respiratory treatments, the weekly therapies to combat morbidity, coordinating the above, advocating for health care and nursing, honestly it felt like this is all I did.

To remedy my guilt of not playing with him more and having fun, I had to remind myself that following through on these measures is what it meant to parent Keenan.

For as much as these interventions were ingrained into my vocabulary, my autopilot essential to sustaining and elongating his life for seven years, it all left me almost the second

he did.

He died on May 31, 2018. In that moment, I was relieved of my duties as his doctor, his nurse, his therapist, his social worker, and his case manager. I tended to his body as a grief-ridden mother would. It took Keenan dying for me to resume my intended role.

What remains, and when I reflect upon now, is the emotional resonance of everything we went through. We all know and understand how completely dependent on us a newborn is. With each physical and developmental milestone, they separate from us, gaining more independence and autonomy in the world. This is the normal, healthy trajectory.

Not the case, however, when you have a medically complex child with Krabbe disease, it is the opposite.

The older Keenan became, the further into the disease, he went, the more compromised his brain stem, the greater the pressure on our parent/caregiver/child relationship.

The irony is within his extreme need of me, our symbiotic attachment and the intimacy of our nonverbal communication, I had little understanding of who he really was. What was his favorite color? What music did he like? What story did he want to hear next? What did Krabbe disease really feel like? All those little pieces of information that collectively distinguished his personality were locked inside him. It got to the point where I dreaded his birthday and Christmas every year. Everyone asked me what they should get him. What should you got him? What should we get him? What should Santa bring him? There's great pain for me in not ever knowing.

Although altruistic, it is depressing to choose fundraising for disease over fulfilling your child's desires.

Keenan's brain and tissue are stored in the Neural Development and Rare Disorders Repository contributing to research. He goes to work every day advancing our knowledge of Krabbe

disease. And although we have made significant gains in the past decade, his donation is a physical reminder of our children's sacrifice and the quality of life at stake. Thank you.

CYNTHIA POWELL: Thank you. We'll next hear from Karlita Blackwell.

KARLITA BLACKWELL: Good morning, and thank you for this opportunity. My name is Karlita Blackwell and I reside in Missouri with my husband Ryan and our 5-1/2-year-old son Ezra. In October of 2016, we received his newborn screening results, confirming the diagnosis of Krabbe leukodystrophy. While overcome a shock and devastation, we were later given a glimpse of hope when informed of treatment in the form of a stem cell transplant due to catching his disease early while he was pre-symptomatic.

The same evening of his diagnosis, we were connected with Krabbe expert, Dr. Kirchberg, at Duke University and made the decision to travel there for his life-saving treatment.

It has now been over five years, and I can confidently say there isn't one day that goes by that I don't think to myself, what if he hadn't been screened, and what if we would have missed this.

So, I'd like to tell you all, what we would have missed. We would have missed a little boy who can't wait for his first day of kindergarten in the fall after three successful years of preschool. A boy who would eat donuts and bacon for every meal if we let him. We would have missed a little boy who loves riding his bike, going to the beach, and riding horses. A little boy who gives the best kisses, loves dancing in the car, and is the first to tell a silly joke. He has never met a stranger or an animal he doesn't love. Chickens are his favorite. We would have missed a boy whose joy is contagious, his laugh is infectious, and his resilience is unmatched. He is a little boy who works harder than anyone I've ever met and welcomes all that life has to offer him with

curiosity and a smile on his face his life. His life is full, his life as gratifying, and his life is invaluable. And if you're lucky enough to meet him, that clearly shines through.

We could have missed this and I know far too many families who have unjustly missed these precious moments with their children because they were not given the same opportunity for treatment due to not being screened at birth.

We cannot give these parents those moments back, but we can create change to ensure that no other families miss those moments, and that no other child is resigned to an early and painful death. Thank you for your time and consideration.

CYNTHIA POWELL: Thank you. We'll next hear from Dr. Joanne Kurtzberg.

JOANNE KURTZBERG: Hi, can you hear me okay?

CYNTHIA POWELL: Yes.

JOANNE KURTZBERG: Okay, great. Well, hello, everyone. My name is Dr. Joanne

Kurtzberg, and I'm the Director of the Marcus Center for Cellular Cures at Duke.

I started in directing the Pediatric Blood and Marrow Transplant Program at Duke University Medical Center where we've transplanted nearly 400 infants and children with leukodystrophy including 60 with Krabbe disease, which is the largest experience in a single center. As you know, Krabbe disease is a medically serious, life-threatening condition that in its most common and most severe form affects young infants in the first year of life. The incidence is estimated to be approximately 1 in 100,000 births. Without treatment, as you've heard, infants develop feeding problems, spasticity, extreme irritability, seizures, blindness, profound developmental delay, and die within the first few years of life.

Hematopoietic stem cell transplantation, if performed in the first month of life or in the pre-symptomatic phase of disease, significantly extends and improves

quality of life.

For this reason, it's become the standard of care of for patients with Krabbe disease.

Newborn screening for Krabbe disease, initially piloted in New York state, has come a long way from the early days. As you'll hear from Dr. Matern, the addition of psychosine as a second-tier test transforms the ability to definitively identify babies with infantile Krabbe disease in a matter of days.

The use of psychosine has also greatly reduced the number of false positive newborn screening results.

The vast majority of families who conceive a baby with Krabbe disease don't know they're at risk. They learn when their sick and symptomatic baby is finally diagnosed after months of going from doctor to doctor to find out what is wrong. At this point, it's too late to help their baby. In fact, not a week goes by, where I'm not contacted by a family whose baby

was just diagnosed with Krabbe disease, who are desperate for help, and I have nothing but compassion to offer.

In the first years of transplantation of babies with Krabbe disease, we learned that the procedure was not effective in babies who already had clinical symptoms. However, in pre-symptomatic babies, we learned and published in the *New England Journal of Medicine* in 2005 that transplant prolonged life by decades and improved neurologic function and quality of life.

While transplant is not a cure, it's a highly effective treatment that transforms the lives of babies with the infantile Krabbe disease and their families. At the very least, these newborns should be identified in a timely fashion, so that their parents can be given the opportunity to make a choice about whether their child should undergo this procedure.

Newborn screening is the only way to identify these babies at a time when treatment

can make a difference.

While this is true for transplant today, it will also be true for gene therapy and other innovative therapies that are in early clinical trials today and are expected to be available within the next few years.

For these reasons, and as a physician and a person who has directly witnessed the human suffering caused by Krabbe disease, I strongly encourage the Advisory Committee on Heritable Disorders in Newborns and Children to vote in favor of moving Krabbe disease forward to full evidence review. Thank you.

CYNTHIA POWELL: Thank you, and next we'll hear from Dr. Dieter Matern.

DIETRICH MATERN: Thank you, Dr. Powell, for your service and successful leadership of this Committee and for giving me the opportunity to return to the Committee today as a private person, just a simple laboratory geneticist in the southern cornfields of Minnesota.

I'd like to speak to the nomination of Krabbe disease to the Recommended Uniform Screening Panel, which I support.

Krabbe disease was nominated by the Hunter's Hope Foundation for the first time in 2008, underwent an evidence review, and then failed to be added to the RUSP. Several reasons were given to why the Committee felt that it was not yet appropriate for Krabbe disease to be added to the RUSP. I agreed with the Committee's decision in 2010.

Moreover, in 2015, as a member of the Advisory Committee on Heritable and Congenital Disorders to the Minnesota Department of Health, I voted against the addition of Krabbe disease to Minnesota's newborn screening panel.

My primary concern pertained to the screening approach at the time. As you know, New York state began screening for Krabbe disease already in 2006 with a procedure that was highly sensitive but not very specific. After eight years of screening, New York reported in *Genetics*

and Medicine a positive predictive value of only 1.4% for infantile Krabbe disease.

For a disorder like Krabbe disease, I firmly believe that the false positive rate must be kept as low as possible and an approach based on enzyme activity alone or even with sequencing of the GALC gene as a second-tier test did not meet that requirement for me.

However, from a laboratory testing perspective, Krabbe disease is not only characterized by a low GALC enzyme activity and disease-causing variance in the GALC gene.

Indeed, Dr. Orsini from the New York Screening Lab was first to show that psychosine can be measured in dried blood spots and is elevated in babies affected with Krabbe disease. Psychosine is a toxic byproduct generated when the galactocerebrosidase activity is deficient.

Therefore, it appears to be a good marker to adjudicate of the finding of reduced galactocerebrosidase activity is clinically relevant and not just a sign of what is known as

pseudo deficiency.

We adopted psychosine analysis at the Mayo and in December 2015, the state of Kentucky through legislative action added Krabbe disease to its newborn screening program. This prompted our colleagues in Kentucky to reach out to us at the Mayo Clinic to see if we could help them by performing private screening in our lab 700 miles away.

We were hesitant, given that Krabbe was not yet on the RUSP, but we came to an agreement under which we would screen for Krabbe disease but also for Pompe disease, MPS I, and, as of 2018, X-ALD.

While the Kentucky Screening Lab wanted us to follow the New York model and use molecular testing as part of the screening approach, we could convince them that psychosine should at least be part of the screening procedure.

Since February 15, 2016 we have now screened 350,000 Kentucky babies. We reported 2

cases as presumptive positive for Krabbe disease. Both patients were indeed affected and both received a bone marrow transplant, one on the 24th day of life and the other on the 30th day of life. Neither transplant occurred in Kentucky, but one at Duke University and the other at the Children's Hospital of Pittsburgh.

Both patients are alive and doing well at 5 years and 5 months old. Clearly, we can already say that the transplant was life-saving for the first patient, because patients with infantile Krabbe disease rarely survive beyond 2 years old.

Please also note that neither patient had a genotype of certain significance, meaning there was one known pathogenic variant in combination with the variant of uncertain significance in the first case and with only a likely pathogenic variant in the other.

Accordingly, I am certain that these babies would not have received a diagnosis and transplants as quickly as they did if psychosine

had not been part of the screening process.

I also want to point out that the nomination under your consideration today is not to just add Krabbe disease to the RUSP, but also recommends a screening approach that is based on measurement of galactocerebrosidase activity as primary screening test with psychosine measurement employed as a second-tier test. Only if psychosine is elevated should the screening result be considered positive. Given the current data, the nominators are aware that this approach should identify all new ones with infantile and late infantile Krabbe disease but may not uncover all cases of juvenile or adult Krabbe disease.

Therefore, the nomination before you recommends adding infantile and late infantile Krabbe disease to the RUSP as a core condition and the later onset forms of Krabbe probably disease as secondary targets.

This approach would follow the example of spinal muscular atrophy, where your Committee defined explicitly what constitutes SMA

and acknowledged that this compromise would identify most cases of SMA, while avoiding identification of an unmanageable number of SMN-1 variant carriers.

In conclusion, I want to reiterate my support of the nomination of Krabbe disease to the RUSP, as described in the nomination package.

As you heard from speakers before me, the clinical knowledge gaps have been closed as much as possible, relevant follow-up and monitoring guidelines have been developed and published, and I just reminded you that the laboratory screening can be efficient and effective.

As closing remarks of the nominations cover letter state, after nearly sixteen years of newborn screening for Krabbe disease and now 30 percent of US newborns already being screened for Krabbe disease, I firmly believe that it is time to add Krabbe disease to the RUSP using the screening approach outlined in the nomination. The consequence can be equitable

access to timely and life-saving treatment for every US child with Krabbe disease, while minimizing the negative impact of false positive results.

Thank you for your continued consideration of this nomination and I'm happy to answer any questions you may have today or at any other time.

CYNTHIA POWELL: Thank you. We were also supposed to hear from Richard Poulin, and we hadn't been able to identify him. If he is present, if he could raise his hand and let us know that he is available to give his comments. Well, it looks like he was unable to join us today.

I'd certainly like to thank everyone who provided public comments today and we will go on now to discuss the Krabbe nomination.

KRABBE NOMINATION SUMMARY

The Committee received a nomination to include Krabbe disease to the Recommended

Uniform Screening Panel. To briefly review the nomination process, the first step is for HRSA to conduct the initial review for completeness. After it has been determined that the nomination package has all of the required components, the Nomination and Prioritization Workgroup reviews the information submitted in the package and provides the Committee with a summary and recommendation as to whether or not the condition ought to move forward to a full evidence review.

The Committee will then vote to assign or not assign the nominated condition to the external Evidence Review Group that conducts the Evidence-Based review and, as noted by our public commenters, as a bit of background, the Committee heard the external Evidence-Based review after Krabbe was initially nominated and in 2010, the voted to not recommend inclusion on the RUSP and the conditions -- the reasons at that time were due to the case definition lacking and that the testing algorithm, as well as the treatment and outcomes. Next slide, please.

Oh, first, I'd like to recognize the members of the N&P Workgroup including Kyle Brothers, Carla Cuthbert, Shawn McCandless, and Scott Shone and thank them for many hours that they spent with reviewing of this nomination package. Next slide, please.

So, Krabbe disease is an autosomal recessive lysosomal storage disease caused by homozygous or compound heterozygous pathogenic variance in the gene coding for the enzyme galactocerebrosidase or GALC. It is also known as globoid cell leukodystrophy. The most severe form is the infantile form or infantile Krabbe disease, IKD, and that is the intended target for newborn screening, as well as the late infantile form.

Infants with the infantile form develop symptoms in the first 2 to 12 months of life. Symptoms include irritability, feeding difficulties, failure to thrive, spasticity, vision loss, seizures, aspiration pneumonias, loss of fine and gross motor skills, and loss of

communication skills. Most children die by 2 years of age.

Other forms include the late infantile form of Krabbe disease with onset from 1 to 3 years of age, juvenile Krabbe disease with the onset at 4 to 17 years of age, and adult Krabbe with onset above 18 years of age. Next slide, please.

So, the sponsoring nominating organization was Hunter's Hope Foundation and co-sponsors included several researchers and expert clinicians, and at least a couple of them you've heard from today. Next slide, please.

So, the Nomination and Prioritization Workgroup in reviewing a nomination package needs to enter -- needs to reflect on three key questions that I'll review now.

First is, is there prospective pilot data in the US or internationally from population-based assessments available for this disorder, and we answered yes to that. There are

currently 9 states screening for Krabbe disease. At the time of the nomination package submission, there were 8 programs in the US. States that have been screening for Krabbe disease include New York, Missouri, Illinois, Kentucky, New Jersey, Tennessee, Ohio, Indiana, and Pennsylvania.

At the time the nomination package with submitted, 5.7 million babies had been screened for Krabbe disease. A total of 15 babies were identified with infantile Krabbe disease through newborn screening and 2 more had been diagnosed in the second year of life with late infantile Krabbe disease, for an estimated incidence of 1 in 338,418. Next slide, please.

The next question regards does the screening tests have established analytic validation. There are several laboratory-developed tests being used for newborn screening for Krabbe disease, but there is an FDA-approved kit that screens for 6 lysosomal storage disorders using tandem mass spectroscopy.

First-tier population screening utilizes measurement of GALC activity and also detects carriers and those with pseudo deficiencies and, as pointed out by Dr. Matern, was not very specific for diagnosing those with infantile or late infantile forms of Krabbe disease. It has low specificity.

CLIR was suggested to decrease the percent of positive screens in New York state. Utilizing CLIR, it decreased the need for repeat GALC analysis from 0.44% to 0.09% and the need for second-tier from point 0.035% to 0.005%.

The workgroup did have some concerns about the availability of CLIR for all state newborn screening labs. Next slide.

Also, as pointed out, use of psychosine as a second-tier screening method is also being utilized. Psychosine is a substrate for GALC and in Illinois, 0.06% of cases required second-tier psychosine.

Measurement of psychosine is a laboratory-developed test. It's estimated to

cost approximately $100 per sample. There is a need, in most cases, to send the test to referring testing laboratories with most newborn screening labs not having the capability of testing for psychosine. So, that was one question that the N&P Workgroup had was the availability of psychosine measurement. However, it was felt that the cost was reasonable for a second-tier test. Next slide.

Continuing, some states are also utilizing gene sequencing as a second- or third-tier test. There is a relatively common 30 kb deletion in the GALC gene and homozygosity for this deletion would be consistent with infantile Krabbe disease.

There are also a number of other pathogenic variants that have been identified in the gene and are known to be associated with the severe form of Krabbe disease.

Also, gene sequencing can help detect pseudodeficiency alleles, and this can cut

down on the number of positive screen cases. Next slide, please.

There was a review published in 2021 of the Illinois experience for newborn screening for Krabbe disease. Illinois began screening for Krabbe disease in 2017. They found an overall incidence of 1 in 250,000 cases. Between 2017 and 2020, they had screened 494,147 newborns and they found that 838 cases required repeat testing and the breakdown was utilizing of the GALC activity as less than 13% and for those patients who ended up having pseudodeficiency alleles, there were 178 of them, reflecting 62% of the send-out cases and utilizing psychosine measurement as the second-tier test and a cutoff of less than 2nM of psychosine, there were 178 cases in that category who ended up also having the pseudodeficiency alleles who were then diagnosed as negative for Krabbe disease and not requiring any follow up.

There were 35 cases or 12% that were sent out that had psychosine levels less than

2nM. There were 5 in this category that were between 2-3nM and were found to have variants of uncertain significance and were diagnosed as having VUS and not being likely affected and did not have follow up.

There were also 67 cases or 23% that had psychosine levels less than 2, 7 between 2 to 3 who were found to have one pathogenic allele or the heterozygous 30-kb deletion, the common deletion associated with severe Krabbe disease and they were categorized as being a carrier and did not require follow up.

And then I'll next show their data for those with two pathogenic mutations.

So, they had 6 cases that were suspected of having late-onset Krabbe disease and their psychosine level measurements were between 2 to 6. The first case had 1 heterozygous pathogenic variant along with 1 variant of uncertain significance, along with a pseudodeficiency allele. Case 2 had a heterozygous pathogenic variant, actually 2

heterozygous pathogenic variants and 2 heterozygous pseudodeficiency alleles. And then the other cases have had homozygous pathogenic variants or were compound heterozygous VUSs. So, these patients were and are being followed long-term for suspected late onset Krabbe.

For the 2 cases with likely infantile Krabbe disease, notice that their psychosine levels were 10 and 35 and 1 had heterozygous pathogenic alleles and the other had heterozygous likely pathogenic alleles. Next slide, please.

Looking at the reported Illinois experience in their manuscript, they stated that with just measurement of galactocerebrosidase, the positive predictive value for a positive screen was only 2.8%. When using psychosine measurement as a second-tier, the positive predictive value went up to 40% and when also utilizing looking for the 30-kb deletion followed by sequencing, the positive predictive value was 100%.

The next key question that the N&P Workgroup addressed is, is there a widely available and CLIA- and/or FDA-approved confirmatory test and diagnostic process, and we answered yes to that.

Measurement of GALC activity can be done in leukocytes, preferably using a high sensitivity assay. Also, it's recommended that psychosine analysis in another dried blood spot specimen or a erythrocytes be done as part of confirmatory testing, as well as molecular genetic analysis of the GALC gene looking for the 30-kb deletion, although it's recognized that number of infantile Krabbe disease cases would be negative for the 30-kb deletion, but sequencing would be necessary to detect the other types of pathogenic variants in the GALC gene. Next slide.

So, regarding the condition information, the N&P Workgroup looks at whether the nominated condition is medically serious, and the answer to that was yes. Next slide.

And next is, is a case definition and the spectrum of the disorder well-described to help predict the phenotypic range of those children who will be identified based on population screening. This, in the opinion of the N&P Workgroup, is still unclear. There has been some concern about, at least in the past, of whether those based on measurement of enzyme alone and of sequencing actually had the severe infantile form of Krabbe disease. However, use of psychosine appears to alleviate some of that concern with those with infantile Krabbe disease having very elevated psychosine levels, at least given the information that was provided to the NNP Workgroup.

So, psychosine measurement certainly aids in identification of those with infantile Krabbe disease.

There is some genotype phenotype correlation with alleles known to be associated with infantile Krabbe disease, but some infantile Krabbe disease cases may be difficult to identify

or differentiate from late infantile Krabbe disease.

And we'll next look at some of the data provided from a manuscript that was published after the initial nomination submission package and during the time that the N&P Workgroup was reviewing the nomination. Can we go to the next slide, please?

So, the N&P Workgroup did go back and ask the nominators to provide some additional information for all known patients with Krabbe disease from published and unpublished sources, those who screen positive, the number of true positives, the number of false negatives, those with -- who were diagnosed as having infantile Krabbe disease, and how they were identified, the number undergoing hematopoietic stem cell transplant, and also the transplant outcomes.

So, this slide and the next one will show the data that was provided to the NNP Workgroup going through each of the states that have been doing newborn screening for Krabbe

disease.

First from Kentucky, there was 1 baby identified with infantile Krabbe disease and was transplanted. This patient was found to have neurodevelopmental delays but described as a happy camper and the parents were glad that newborn screening from Krabbe disease was available when he was born.

The Illinois experience was that 5 cases of infantile Krabbe disease and 7 with likely late-onset Krabbe disease or late infantile had been identified; 4 had been transplanted. All transplanted babies were reported as doing well, except with mild developmental delays. One family had declined stem cell transplant.

In New York state, things were broken down from the original method of newborn screening and then after psychosine and genetic molecular testing were incorporated into the algorithm. So, initially, the 7 transplanted cases for infantile Krabbe disease, the outcomes

of the first 4 patients were previously reported and published by Wasserstein and others and those included babies, 3 of whom had died, 2 from transplant complications, 1 had been untreated, 2 who had received transplants are reported as having moderate-to-severe developmental delays. And the transplants had occurred between 24 and 41 days of age. Next slide, please.

And then, New York had done the psychosine screening and there was were 2 infants with infantile Krabbe disease, one had been transplanted but no updates were available.

And then in Missouri, there had been 2 cases with infantile Krabbe disease, 2 received -- both of whom received successful transplants with some developmental delays reported.

New Jersey had not found any with infantile Krabbe, 2 had likely later-onset Krabbe disease.

Ohio had 2 with infantile Krabbe disease found through newborn screening, but Ohio is unable to collect information after short-term

follow-up. They reported that they think that both were transplanted and that 1 with later-onset Krabbe disease may have been transplanted.

In Tennessee, there had been none with infantile Krabbe disease found.

So, totals came to 71 total with 17 infantile Krabbe disease, 1 with late-onset Krabbe disease and 53 with likely late-onset Krabbe disease, with no symptoms, 15 had been transplanted, and then the other 3 from Ohio possibly transplanted. Next slide, please.

And this is just a point out that the states that had changed their algorithms for screening adding psychosine and/or genetic testing. Next slide, please.

So, the paper that was published during the period that the N&P Workgroup was reviewing the nomination package was by Page and others and reported results for 6 patients who had been identified through newborn screening and had confirmatory testing and had hematopoietic stem cell transplants, and you see here in Table

1 the enzyme activity measured as well as the
2 psychosine levels measured on dried blood spots
3 and note that the psychosine levels for all 6
4 patients were very elevated whereas normal
5 psychosine is less than 2 or at least less than
6 3.
7 They also had additional testing,
8 including measurement of protein in the CSF and
9 underwent mutation analysis and, as you note
10 patient 3 was homozygous for the 30-kb deletion.
11 I'm not sure about patient 4 where just 1 variant
12 is reported. Whether that was actually
13 homozygous or not was not clear to us in the --
14 in the manuscript.
15 Three of the cases already had
16 abnormal MRIs and other neurological testing was
17 abnormal for several of them pre-transplant.
18 Next slide, please.
19 So, the additional information
20 regarding the condition that the N&P Workgroup
21 addresses is the characteristics of the screening
22 tests are reasonable for the newborn screening

system, among other aspects, a low rate of false negatives, and we answered yes to this. There were no known false negatives reported and again that psychosine testing is a reasonable second-tier test and the cost is on par with other types of second-tier testing, such as dried blood spot GAGs for MPS conditions. Next slide.

Also, is the spectrum of disease broad and are those who are most likely to benefit from treatment identifiable, especially if treatment is onerous or risky, and we answered yes to this, that infantile Krabbe disease cases most, if not all, can be identified with second-tier and confirmatory psychosine measurement and genetic testing.

There are a number of patients who have slightly elevated psychosine VUS alleles who are being followed, not knowing whether they are just carriers or have a later-onset form of Krabbe disease.

One important thing is that studies of patients with Krabbe disease have reported

that the greatest benefits, the best outcomes can be obtained when the transplants are done within the first 30 days of life and those don't include necessarily those identified through newborn screening, but cases where there may have been a positive family history. Next slide, please.

The group also discussed the defined treatment protocols, FDA-approved drugs, if applicable, and is their treatment also and are all these things available. That's still a bit unclear. There are over 100 pediatrics centers in the US that do hematopoietic stem cell transplants, but only 9 have been doing transplants for those with lysosomal storage conditions, and not all have had experience with Krabbe disease. However, the experts from centers where transplants are done on those with Krabbe disease are willing to help those who don't have experience. There was a paper published by Sammy Vergano and others in Virginia pointing out logistical problems for those states who don't have in-state centers and pointing out

that, especially with ideally babies being transplanted within the first 30 days of life and logistical issues for obtaining Medicaid coverage and the ability to send those babies out of state for their transplant can be very difficult. And so, the N&P Workgroup feels that that will be important to consider if this goes forward to evidence review. Next slide, please.

So, are there benefits from treatment, and let's go to the next slide, please.

This is from the Page, et al paper and it shows the developmental outcomes from the 6 patients who were transplanted after being identified through newborn screening. I'll point out that only patient 2 had their transplant prior to 30 days; however, they all were done within the first, I believe, it was 6 weeks of life and it was -- they were transplanted between 24 to 40 days of life. All were alive at the time of this report, and at that time when they were last seen, they were 30 to 58 months of age.

All were gaining milestones and the composite scores and the subscale scores were provided for those 6 infants one year after their stem cell transplant, and you see those at the top in A and B.

So, the greatest difficulty was in their motor skills but their language and cognitive abilities were at the higher level with low normal or borderline scores, and then gross motor was the area where they had the greatest difficulty and again, their receptive skills were the strongest area in their developmental assessments.

And then C through G show cognitive growth scores during time that they were being followed and indicates that they were still gaining some degree of improvement in their in their development. Next slide, please.

And this is some of the information that was provided in the paper regarding their motor skills, speech and language development, ambulation, tone, and is seen in this

supplemental table 1. They were -- some were able to eat by mouth, others required gastrostomy tubes feedings, most were able to drink from a cup, hold toys, feed themselves crackers. They had at least a few words or short sentences. Some had a strong use of sign language and gestures and 1 was able to walk independently. The others needed assistance with ambulation and most had spasticity, which is common, despite early stem cell transplant in patients. Next slide, please.

So, neurodevelopmental composite and subscale scores were only reported, as I mentioned, for one year post transplant and other descriptions were given for longer-term follow-up but were descriptions and not the actual developmental testing scores. Other cases identified through newborn screening with infantile Krabbe disease have not a lot of specific information available, as noted, that they're not, you know, they were noted as doing well or happy campers.

So, should this go forward, it will be important to obtain more specific information regarding developmental outcomes of patients who were identified through newborn screening and had transplants.

As noted, the gross motor skills were most severely impacted due to the peripheral neuropathy that develops and possibly due to other causes and also, as noted, patients had relatively strong skills in the area of receptive language. Next slide, please.

So, Nomination and Prioritization Workgroup does recommend that Krabbe go forward for full evidence review and Public Health Impact Analysis, and I think that's my last slide.

So, we've gone over the N&P Workgroup findings. I think we can transition to discussion now.

COMMITTEE DISCUSSION AND VOTE

So, we will first have Committee discussion first from -- hearing first from Committee members and then from organizational

representatives.

As a reminder, please use the raise hand feature. I'll call on you in order of when you raised your hand. Please remember to unmute yourself, speak clearly, and state your first and last name before speaking. I'm not seeing anybody, although it might --

NED CALONGE: Chanika has her hand up.

CYNTHIA POWELL: Thank you. Chanika.

CHANIKA PHORNPHUTKUL: Hi, I'm Chanika Phornphutkul, and I'm a Committee member.

Thank you so much for the detailed presentation, I thought. I've been interested in this topic as a biochemical geneticist for a while and realize the New York data. I think what is markedly different this time is the decreased number of false positives with the secondary markers and I think this will help with the, you know, moving forward for the full review.

CYNTHIA POWELL: Thank you. Any other comments or questions from Committee members? If not, we'll open it up to organizational representatives. All right. Well, I'm not seeing any more hands raised.

Does the Committee want to move ahead with a motion? The motion would be whether to move or not move Krabbe disease forward to Evidence-Based Review.

JENNIFER KWON: I would move to move this nomination forward.

CYNTHIA POWELL: All right. We have --

JENNIFER KWON: I thought I would try that out. It's the first time I've ever been the first one to make a move, so.

CYNTHIA POWELL: Thanks okay. There's a first time for everyone. All right, is there a second?

CHANIKA PHORNPHUTKUL: I second.

CYNTHIA POWELL: Thank you. All right. So, are there any additional comments

from the Committee members before we vote?

JENNIFER KWON: I just wanted to make a comment that I really thought the presentation was very clear and detailed. There are a lot of details to go through with this particular newborn screening program, and I appreciate the time the nomination committee spent. Thanks, and I think that's probably why they are so few comments. We're just speechless.

CYNTHIA POWELL: Thank you and thanks to my fellow N&P committee or workgroup members.

All right. Any other questions or comments before we take a vote? Does any Committee Member have a conflict of interest regarding this vote and need to recuse themselves? Are there any Committee members who need to abstain from voting?

All right, I will read your name and if you're voting to approve the Krabbe disease move forward to evidence review, please say yes, if you object, please say no. Kyle Brothers.

KYLE BROTHERS: Yes.

CYNTHIA POWELL: Carla Cuthbert.

CARLA CUTHBERT: Yes.

CYNTHIA POWELL: Jane DeLuca.

JANE DELUCA: Yes.

CYNTHIA POWELL: Kellie Kelm.

KELLIE KELM: Yes.

CYNTHIA POWELL: Jennifer Kwon.

JENNIFER KWON: Yes.

CYNTHIA POWELL: Shawn McCandless.

SHAWN MCCANDLESS: Yes.

CYNTHIS POWELL: Kamila Mistry. I don't think she's on but just checking in case. Melissa Parisi.

MELISSA PARISI: Yes.

CYNTHIA POWELL: Chanika Phornphutkul.

CHANIKA PHORNPHUTKUL: Yes.

CYNTHIA POWELL: And Cynthia Powell, I vote yes. Scott Shone.

SCOTT SHONE: Yes.

CYNTHIA POWELL: And Michael Warren.

MICHAEL WARREN: Yes.

CYNTHIA POWELL: Thank you. I'd like to thank the Committee for their thoughtful consideration. Krabbe disease will be assigned to the Evidence Review Group. The ACHDNC now has nine months to complete the Evidence-Based Review and vote on whether or not to recommend Krabbe disease for addition to the RUSP.

BREAK

CYNTHIA POWELL: All right. We're actually right on schedule. We will now take a 10-minute break. We'll reconvene at 11:50 a.m. Eastern time and that will then proceed to our last session of the meeting. Thank you.

UPDATES ON NEWBORN SCREENING FAMILY EDUCATION PROGRAM

CYNTHIA POWELL: Welcome back everyone. For our last session, we have a presentation from the Newborn Screening Family Education Program, which is a HRSA-funded program whose purpose is to develop and deliver educational programs about newborn screening,

counseling, testing, follow up, treatment, and specialty services. We will hear from Ms. Natasha Bonhomme and Ms. Marianna Raia.

Natasha Bonhomme brings nearly 15 years of nonprofit maternal and child health experience to her role as the founder of Expecting Health at the Genetic Alliance.

She launched Expecting Health to bring together a range of consumer and professional stakeholders to address the need for clear, science-based information for families and individuals through tangible, actionable messages.

Her programmatic portfolio includes leading Baby's First Test, a national resource, which reaches over 600,000 families and health providers annually, convening the Perinatal Nutrition Collaborative, a coalition of organizations and nutrition experts that share emerging science and research efforts and participating on numerous committees on maternal health and dignified care through the prenatal

and postnatal periods.

Ms. Bonhomme has also testified in front of Congress on the importance of family support and education in newborn screening.

She completed her undergraduate degree in psychology and following conducted in-field assessments of educational systems, with a focus on pre-K students and classrooms.

Afterwards, she went to the community focused Genetic Alliance, where she established, built, and sustained the Maternal and Child Health Division.

She is a board member of the DC-based, federally-qualified, Health Center, Whitman Walker Health, which provides affirming community-based care with a special focus on LGBTQ and HIV care.

Marianna Raia is the Associate Director of Programs at Expecting Health. Marianna brings over 15 years of experience in the genetics, health care, and biotechnology industries.

As a genetic counselor, she has dedicated her career to bringing forth awareness of genetic knowledge, family advocacy, and community education.

Driven by the mission to increase access to genetic services, she has helped innovate and deliver new models of patient care through patient-centered education and telehealth services.

Marianna is committed to helping patients, providers, and the public understand how genetic information can empower you to make decisions about your health and the health of your family.

She earned her Master of Genetic Counseling degree from the University of Texas at Houston Health Science Center.

I'll now turn things over to Natasha Bonhomme.

NATASHA BONHOMME: Great. Thank you so much for the introduction, and we are really excited to be able to share with you some -- a

slice of the work that we've been doing over the past four years under the Newborn Screening Family Education Program. Next slide, please.

Of course, we want to thank our funders, HRSA, for the opportunity to be able to do this work and now to be able to share it with all of you. Next slide, please.

So, our vision under this program is really to create a landscape where all families have equitable access to newborn screening information. That has always been kind of our North Star, if you will, and our mission is to meet families where they are. We know what we would like them to know and what we hope and wish that they know about the newborn screening system. But really, our starting-off point is to see, okay, what is the experience families are having during this time, whether it's that prenatal time or right after having a baby, and going through that newborn screening process, sometimes unexpectedly, and to see what their needs are there. Next slide, please.

I'm going to go through the objectives and what was really laid out in the initial guidance around this program so you all get a sense of kind of the context that we're working within.

So, what we were looking to do on the front of family education is to increase from 20% or increase by 20% from a baseline the number of parents and families trained and educated on the newborn screening system annually. From a lens of partnerships, it was to increase by 15% the number of partnerships that we have to increase awareness of newborn screening and to facilitate dissemination of materials, both what was already created, as well as what we created under this program. When thinking about family education and leadership, we looked to increase by 20% the families and parents that were trained and that were able to report an increase in knowledge, skill, ability, and self-efficacy, and I think that particularly that last word self-efficacy, is really important. So, it wasn't

just about being able to come back and say I know what newborn screening is, but really to say oh, I know how to incorporate this within my child's health care.

And then lastly, looking at medically underserved families to increase by 10%, both the outreach to medically underserved populations as well as to increase the number of medically underserved individuals that were aware of newborn screening.

I put this here, because sometimes when people think of education, we think, oh it's really hard to get the data or to know what we're doing, but in part, because this was explicitly laid out in our guidance, we really work to structure the program and to be able to do evaluation that really would catch that.

I will say as we are now about to end the fourth year of this project, every year we've been able to hit these benchmarks. Next slide, please.

Our approach, really, to all of our

work that we do through Expecting Health, but particularly in this program, is to connect, convene, create, collaborate, collect, and communicate, and not just to use all C words, but that is a communications technique. We really want to be able to show that it takes multiple approaches at multiple levels to really be able to move the needle when it comes to education and communication, and to make sure that families are hearing and learning and then being able to apply what they have learned in to their child's health care. Next slide, please.

So, at a high level to date, our program has trained 234 families. We have actively partnered with 25 organizations and individual, and when we say those 25, that means there is a written agreement around partnership, meaning that they will disseminate information for us, we will get feedback from them in terms of what it looks like. These are very formal partnerships. We have many more informal partnerships through all of the other work that

we do, but wanting to give a bit of background on that. We have 12 ambassadors, which hopefully at a different date, we can share with you more detail about our Ambassador Program, but 12 ambassadors in 10 different states that are actively working with each other, learning about newborn screening, and then going out to their communities to share what they have learned. And then also 3,000 -- we've reached 3,000 people in medically underserved populations to see how they are -- to make sure that they are aware of newborn screening, and we'll get into those specifics a little bit later on. Next slide, please.

This really shows kind of all of the different pieces that make up this particular Newborn Screening Family Education Program. Today, like I said, we are only talking about a slice of that, which is that middle slice in terms of the work that we've done around prenatal education, as well as our work around social media.

But again, all of these pillars throughout all of this is our education and training work and creating content, our family leadership work, which is really helping to connect families to opportunities where they can be advocates around newborn screening is that we focus on meeting those families where they are and where they want to be able to make an impact in the system. Next slide, please.

So, what have we seen? We've been able to increase awareness and education opportunities, but this has required multiple strategies. As you can see, there's a lot that we're doing to be able to reach families and to get them engaged, and it takes all of it. There isn't just one thing that it's like oh, it was videos, okay, let's just do videos. It really was the combination of all the work that we're doing.

Really having both organizational and individual partnerships was critical in terms of meeting families where they are and to be able

to get messages out at different levels, particularly at this time of pregnancy and those first few years of parenthood that really people are bombarded with information. It really takes all of those different avenues.

And then also, really looking at innovative ways to incorporate both online and in-person strategies to get information out. I think a lot of times people come to us and really are just saying, what is the one thing that we can do, and there isn't just one thing. It really is about having these different avenues and channels. Next slide.

And with that transition to this slide, I will pass it on to Marianna.

MARIANNA RAIA: Good afternoon, everyone, and thank you so much for the opportunity, and thank you to the Committee for giving me the chance to join you today and share a little bit more about and expand on the work that Natasha just laid out.

As you heard introduction, my

background is in genetic counseling, and I bring that up specifically because I've spent a significant amount of my time working with prenatal populations, and that has proved to be very helpful and that lens has been incredibly helpful in the work that I will walk you through next.

But before we jump into some of the important data that I'd like to share, I recognize and we recognize that this group is incredibly familiar with the importance of prenatal education and the critical time period that that presents for families to learn about newborn screening. But it is helpful to frame that conversation with a few key pieces of data that I did want to just kind of bring back up as reference.

So, when we think about why we should focus and really dedicate effort and resources to prenatal education, we know from literature and from work that we've done that when a pregnant woman receives information from

her health care provider, that that is correlated to increased satisfaction. The trust that a woman or an expecting mom has with her health care provider is a critical time period where information can be shared.

We also hear directly from families and a variety of work. Again, we've conducted through discussion groups, as well as literature that's available that states that parents really do want to have this information prior to delivery. Oftentimes, families are learning about newborn screening after the screen has happened, and if we can introduce this information earlier, we know that that improves the experience for families.

We also know that guidance is available from professional organizations, including the American College of Obstetrics and Gynecology, that states prenatal education for newborn screening should be happening.

But I also think everybody can recognize that it's hard to provide this

education during pregnancy. OBs, prenatal providers, and families are inundated and overwhelmed with information at this point. So, the reality is that many families are not receiving this information during pregnancy. Next slide, please.

So, what we set out to do was create a pilot program that really implemented and introduced an initiative to educate about newborn screening during pregnancy, and there was a significant amount of work in the development phase that was conducted through, you know, with input from the steering committee of this program as well as working groups with the pilot sites that we were collaborating with and through several discussions and many efforts, we were able to hone in on three specific goals for this work.

The first really, and as Natasha laid out, much of our work really is to increase awareness of the process and importance of newborn screening, specifically in medically

underserved populations. So, we know that families from medically underserved populations are less likely than other families to be familiar with newborn screening. So, this and everything that I will share with you really is focused on improving that awareness and education within medically underserved communities.

We also wanted to assess the accuracy of knowledge in these communities and in these participants regarding how, when, and why newborn screening occurs. So, in just a moment, I'll share with you how we evaluated that.

And lastly, but certainly not least, there were a number of resources that we developed in collaboration with families and clinicians to conduct this pilot, and those resources directed two additional resources that many of you have contributed to over the years.

So, we really wanted this initiative to become a way in which families had access to additional information that they might need, should they find themselves in a situation of an

out-of-range newborn screening result or needing that information at a later time. Next slide, please.

There were, as you can imagine, a number of key strategies that we were very intentional and strategic about implementing through the development and implementation of this work, and many of these resonate even beyond these prenatal pilot efforts and the work that we do under this program.

But first and foremost, as we -- as we initiated conversations and partnerships and collaborations with each of the communities that we've worked with, our first questions were -- our first step was really to ask a lot of questions of both the families and clinicians working in those environments. It was very key in the development phase that we were integrating cultural perspectives, when we were developing materials, that we were utilizing pictures and language that would really resonate with the families that were utilizing these tools and we

also knew that that would be incredibly important in terms of leveraging trust with the health care providers and partners that we were working with.

As I mentioned earlier, we know that for expecting moms, in particular, those that are receiving care are receiving care from individuals that they -- that they reportedly trust. And so, we wanted to really utilize those sources, understand where those trusted health care partners are, and work and identify them.

Another key piece to this work was really thinking through. Again, we know that for many prenatal providers, it is an incredibly busy time. There is a lot of additional information outside of newborn screening that has to get covered in visits. And so, it was key to really think about what are -- what are birthing centers doing, what are prenatal providers doing, and where are the places that we can incorporate into workflows that are already in place so that we're not introducing something completely new.

And this ties into -- the next

strategy that we really leverage ties into what I've mentioned previously, but we really wanted to use practical and relatable materials and so you'll hear a little bit more about what that truly means, but thinking about what are the materials, what are the tools that we know families already use. We know many families use their smartphones to look up information, to access information. We know that not all families have access to smartphones, and if that's not the case and someone's not in a digital world, what are alternatives that we can be considering?

So, we really spent a lot of time thinking about that and again, as you've heard me say now several times, trust is a key piece to all of this, and really identifying and working with groups where there was already a high level of trust between families and the health care providers that we were working with. Next slide, please.

So, what exactly have we done to

initiate this prenatal effort? So, first and foremost, we targeted and partnered with a number of different community-based prenatal groups. These are groups that were already working with expecting moms, and that already had those workflows in place, and I'll talk in just a moment about the three pilots that we have either completed or in the process of completing.

Next, we developed and implemented an educational initiative, and really, what this initiative included was a pre- and post-test assessment that was 10 questions or less. It was incredibly important to us to keep that very concise, but also important to have an evaluation process to try to measure the success of the tool that we developed.

So, we asked participants to answer a set of pre-test questions. Then we asked individuals to read an informational booklet, and we refer to it as a flipbook, that really provided information about the importance of newborn screening, when newborn screening occurs,

the potential results that an individual might receive from newborn screening results, and also access and, as I mentioned earlier, a list of very helpful additional resources if a family chose to pursue more information and then the final step was again that post-test evaluation.

And we implemented this initiative and we've completed pilots in two unique sites.

The first was a high-risk obstetrics clinic in the Houston area. It was a primarily Spanish-speaking population. Over 80% of patients that are typically seen in that clinic speak Spanish as their primary language. And that was completed between June and August of 2021, and those are results that I will be sharing with you today.

We just recently completed a very similar pilot or a similar initiative, but in a very different mechanism with a Plain community in Indiana. So, this is primarily Amish and Mennonite families that we were working with and, as you can probably imagine, these communities

are highly different, and the way in which we implemented this pilot was very different in both of these communities.

In the Spanish-speaking Houston-based community, most of the materials and the way in which we introduced this were shared digitally. So, patients were visiting their provider during their third trimester, and at a third trimester visit, while the patient was waiting in their clinic room to be seen, the staff shared an informational card with those participants that gave them a very short introduction to newborn screening, but provided a QR code that they were able to access with their smartphone while they were waiting.

That QR code directed them to the pre-test set of questions, then it guided them to read the book that was available, and then the last step was to complete the post-test questions. And I will share with you in just a moment some of the results that we have available from that pilot.

In the Plain community, this is not a community that utilizes digital tools, and we had to really partner and think through what would work best for families that are being seen. And so, what we did to implement this initiative is partner through the Indiana Community Health Clinic with midwives that were visiting families in this community. So, again, while these midwives were visiting in patient's homes or in birthing centers, during the third trimester visit, they would introduce the opportunity to the individual patient to learn more and to read more about newborn screening. Participants in this pilot completed everything in paper. So, the pre-and post-test questions were still asked. Families received a paper questionnaire that they were able to complete and share with our midwife, and the book itself was available in a paper form as well for families. So, we were really thinking through, again, what would these families need to truly meet them where they are.

And the last and final pilot, not

final, but the last site that we are currently working with is a prenatal health clinic in the Oklahoma area. We are very excited to extend this work into tribal communities, and we are just getting started and hoping to launch in the near future with an OB clinic in Oklahoma.

So, all of this work really leads to where we are at this point, and it's to think about and incorporate this type of initiative or this type of effort to become a repeatable model that other prenatal centers can use. Next slide, please.

So, I'm really excited to share with you and, again, this is just a snippet, as Natasha said, of some of the results that we have been able to collect from this quality improvement work.

In our Houston-based clinic, which is the LBJ Hospital, we had a total of 56 participants over a course of 10 weeks that were able to complete both the pre- and the post-test questionnaire. And what you're seeing here on

this slide is an overwhelming increase in the participants' ability to correctly identify answers to knowledge-based questions.

So, the pre- and the post-test questionnaires included five questions that were focused on assessing the individual's knowledge. There was one multiple choice question and four true/false questions, and I'm showing you just a snippet here.

So, one of the questions was -- asked participants to correctly identify the definition of newborn screening, and they were provided with four different options. You can see that in the pre-test setting, only 18 of the 56 were able to correctly identify the definition of newborn screening, and after reading through the book, that number increased to 86%.

Similarly, participants were asked to respond to a true/false question determining or identifying that there are three parts to newborn screening. Prior to, or in the pre-test, only 44% of participants were able to correctly

answer that question, and after reading the flipbook, 96% of participants were able to correctly answer that question.

And then, lastly, we also tried to hone in on knowledge and awareness around what an abnormal result truly means for families or for families to understand what a newborn, excuse me, what an abnormal result means. Prior to reading the book, only about 16% of participants could identify that having an abnormal newborn screening or an out-of-range newborn screening result does not always mean that there is something wrong with the baby. After reading the book, that increased at 82%.

All of these changes were statistically significant, and so I think it's really clear evidence that in this -- and this particular program, this book has been very informative and has been successful in increasing both awareness and knowledge.

We won't have time to go into further detail today regarding the Amish and

Mennonite community, but I will share with you all that the results are also statistically significant. There is also a significant increase in knowledge and awareness that we were able to measure and I'd be happy to provide more information or elaborate on that if anyone is interested at a later time. Next slide, please.

Another aspect that we did try to measure through our evaluation was individual responses and perceptions. And so, we did also, in our pre-and post-test questions ask participants to respond regarding how they felt in terms of their knowledge and their confidence, and you can see here that, you know, almost 90% across the board reported increases -- self-reported increases in their awareness of newborn screening, their knowledge of newborn screening, and confidence of finding information or discussing newborn screening with their doctors.

And so again, you know, this is an example or a way in which really building that awareness and building that confidence can be

done through these prenatal efforts. Next slide, please.

So, what do we do with all of this information that we've been able to gain from this one site, and how can we think about applying that on a broader scale and implementing, you know, on a larger scale prenatal initiatives like this.

So, again, you've heard me say this but I -- one of the things that we have definitely taken away from this work and that we have heard from those that we have collaborated with, what has this successful and what has made this easier to do for some groups is integrating it into existing workflows. So, whether it was in a clinic or whether it's with midwives that are visiting in patient homes and family homes, I think understanding what is already working was critical to then introducing this type of workflow that, as you can see, is quite flexible and when we were designing the tools, the tools were really separate from the workflow. The idea

was that the tools, the book itself, the questions really could be flexible to meet the needs of the clinic and the families in the same way.

And again, you know, we've leveraged mechanisms of learning that families were already used to. We already knew and we confirmed that, even before we started this program in the Houston population, that many of the patients that were being seen there used their phones to access other information that they were getting from that clinic.

In our Indiana population, we also know and understand that the way families prefer to receive information was from their midwives and in a paper form. And so, we really tried to build off of and leverage what was working best for these families.

I think an opportunity and that is definitely worth mentioning is that this work really does require consistency and I think we had great participation in the communities that

we partnered with because there was somebody in that community also helping us to make patients aware of this opportunity, to advocate for this opportunity, and to really help disseminate the information in a way that both the clinics and the families were interested in.

And what we have seen, and I think is a really interesting opportunity from this work, as we've had a number of additional prenatal groups and newborn screening state programs who have learned of this work and who have reached out to us for additional information and we are in either signed partnership or working towards that with five different newborn screening state programs at this time, because there has been an explicit ask or interest in partnering to think about how to best implement prenatal education efforts for newborn screening.

What this also points to as well, we can quantify in these pilot sites, the change in awareness and in education. What we would like to be able, and we're working towards, is look to

and think about how can we evaluate how education during pregnancy impacts longer term outcomes and newborn screening, we know that it raises knowledge, we know that it raises awareness during pregnancy, but can we start to correlate how that might improve an experience for a family at the time of delivery or after a newborn screening result is received. Next slide, please.

And in the last five minutes, I just want to shift gears slightly to share with you a different approach, but that does build off of the work that we learned through this prenatal initiative that we just talked about. So, you know, knowing that one of our objectives is really to think about providing education and making sure individuals for medically underserved communities have access to newborn screening information, we started to ask ourselves, what are the ways that we can reach a larger number of individuals. And, as I know many of you are very familiar with, social media is certainly a tool

that is available to access large numbers of individuals, and we know that, in particular, between the ages of 18 to 24, though, it extends well beyond that age range. We know that social media is a tool that people are using and whether or not you feel it's a trusted source, we know that families turn to social media for information. And so, we really wanted to think about how can we utilize the tool of social media as a potential tool for newborn screening education.

And we're currently in the process of working through this right now. So, I'll focus in with the two-phased approach. I'll focus in today specifically on phase one, which we completed last year, but just to help set context.

In the first phase of this work, we really wanted to ask the question, can we target a specific audience, and can we reach that audience? So, in phase one, we really wanted to hone in on that. In phase two, which we're

currently in right now, we really wanted to ask the question, if we are able to successfully reach and target an audience, can we take it one step further and ask that audience to engage with a particular form of newborn screening education. And if do, we wanted to start to understand to what degree we can introduce education and have families engage with newborn screening information through social media. Next slide, please.

So, in phase one, we ran a 30-day social media campaign and, just to clarify, there are lots of different campaigns that can be run through social media. I am not a social media expert, but these were campaigns, where we were able to identify and set parameters based on different demographics that are available through Facebook algorithms. So, what we really honed in on for our target audience, we utilized age, reported gender, a set of zip codes that we utilized from HRSA's medically -- a list of zip codes that are identified through HRSA as

medically underserved communities, and an estimated income. That is also something that there are algorithms that Facebook has that can collect that information.

So, based on those targeted parameters, we were able to run a 30-day campaign, where we shared and showed educational information and ads about newborn screening to this particular group of individuals, and our goal was to measure of that group, could we reach 30% of that audience. And we were pleased to see that we were successful in our ability to do that. So, through that campaign we were able to specifically reach almost 2 million individuals who were, based on those parameters and that criteria, for being in a medically underserved community.

And, just to clarify, because these terms can be very confusing with social media, reach is a unique individual impression. It could be multiple views by the same person. So, you'll see a difference. We were able to reach

almost 2 million individuals through these ads and there were over 3 point -- or there were 3.7 impressions of these ads during this 30-day campaign.

There were over actually 5,000 clicks from the different ads that were used during this campaign, and then click could be a like, and it could be -- there were clicks that were available within the ads themselves that took participants or took individuals on Facebook into an additional website where they could learn more about newborn screening. But overall, we felt that this initial phase was successful in being able not only to target and define a specific audience that we were trying to reach, but that we were, in fact, successful in reaching the audience that we had intended.

And over 67% of the individuals that we were able to reach through this campaign were between the ages of 18 to 44, which really did hone in on our target audience of expecting moms. Next slide, please.

And I should say really quickly, as we go into phase two, what we are aiming to do in phase two, and what we're in the process of doing right now is it as an expanded version of this social media campaign. So, we recently launched a 6-month campaign where again, we are -- not only are we reaching and using the same parameters to reach our specific targeted audience, and these are all individuals that have expressed interest in pregnancy or who are currently expecting, we plan to also share the flipbook that I had mentioned earlier from our prenatal efforts. So, the specific click that we are encouraging through this campaign is for individuals who see these ads to click a link that takes them into the educational flipbook, where we will now be able to look at and assess how many individuals are reading that book, are they reading it in its entirety, are there parts of the book that are getting more attention than others, and we'll be able to and look forward to being able to learn from that as well.

So, what did we learn from all of this. You know, I think we knew some of this going in, but it's definitely been validated over the last four years of this work. But really, to do this and to increase access to newborn screening education, as you've seen and heard, it really does take multiple strategies to do that, and we've been able, I think, to successfully show that implementation can be done. It does require buy-in from multiple stakeholders, and it does require capacity at both the local and national levels, but it can be done. I think we're learning and seeing that the use of sort of innovative strategies has really helped us reach more families. And it doesn't have to be hard. I think often times this work, it is hard, and I certainly don't want to minimize that. But it can -- it can be done, and I think there are tools now in place to help others do the same.

And we've talked about this a lot, but a big piece to the success here really is partnership and trusted sources as key connectors

to families. Last slide, please.

So, that brings us to how -- how can all of you get involved. Next slide, please.

And really, a partnership is key to meeting families where they are and we've seen that it's not just in this prenatal work and reaching medically underserved communities, but really in all of the work that we've been doing throughout this program. So, again, we won't have time to go through all of this information, but I just wanted to share with you some of the additional unique ways that we are working in partnership and direct partnership beyond these awareness campaigns to reach additional families with newborn screening information, and we've really had a lot of success in direct outreach through doula groups and midwife groups. So, we've been partnering with the state of California to conduct some midwife focus groups and to generate some training opportunities for midwives in the state of California, which has been successful. We've also partnered and

collaborated with undergraduate programs to provide some information and training to undergraduates who are in metabolic courses, Natasha mentioned this earlier, and we look forward to being able to share more with you, and in a future date about our Ambassador and our family leaders that have really been key and integral to sharing information with other families about the importance of newborn screening.

So, with that, I will -- I think that's the last slide. Thank you very much for, again, allowing us the time to share these updates with you and I'm happy to take any questions.

CYNTHIA POWELL: Thanks very much both of you for your presentations and sharing this information with us. We're going to open it up to questions from Committee members and organizational representatives. Carla Cuthbert.

CARLA CUTHBERT: Thank you so much, Natasha and Marianna, for your presentation. I

have a couple of questions for Marianna. So, this -- these are a couple from those of us at CDC. So, we were wondering, how you defined newborn screening in the educational book that you use and whether or not the book -- the resource book that you're talking about, will become available at some point. And just so that I understand, you know, would you comment on whether or not you had experiences with any of the providers and if you could just share some of the challenges that you might have had in engaging with some of the OB-GYN prenatal providers, since some of the states have had some difficulty in the past trying to engage them. I really would like to hear your thoughts.

MARIANNA RAIA: Yeah. Thank you very much for the question and I'm happy to take that in a couple of different parts. So, the way in which we define newborn screening was again, specifically through -- well, we assess that through a multiple choice question, but we define newborn screening basically when it occurred and

provided information at a general level, because this is a national tool, so described that as between 24 and 48 hours after delivery. We talked about the different results that could be available including in-range and out-of-range results, and then we also provided information to readers that included what to do in those next steps. So, talking to your provider, where to go, and things of that of that type.

The book is absolutely available, if anybody is interested. It is available in both digital and paper forms. It's available on a link, and I would be more than happy to share that with anybody that's interested.

And then, I think, specifically regarding prenatal providers and that is -- that is something, again, even before this work, I have worked in prenatal settings for a while and have worked directly with OBs. It is a challenge, and I think where we were successful is this particular initiative doesn't require the provider to provide the education. What it does

require is validation and input and the stress of the importance of this information. But the education itself is something that the individual can do. And so, I think, for that reason, at least in the areas that we were able to try this out, the providers were very open to that. We leveraged clinic staff who are already going into rooms or midwives who are already visiting with families. And so, it didn't introduce as much of a potential burden as I think people might feel it could.

CYNTHIA POWELL: Jennifer Kwon.

JENNIFER KWON: So, noticed the one thing that you didn't say that might be a barrier is the fact that in the real world setting, who's going to pay for this and who's going to be doing this? So, genetic counselor time in the prenatal world is pretty tight already. I think this is a great service and I'm glad that ACOG is supportive and that you have this great data, but the next step is to make it part of the real world prenatal experience. And so, I'm really

curious how that's going to be.

You know, just in my own mind, I can think that maybe making this link available and trying to see if we can't sort of like, get the word out that way, maybe there's a research project there. Like in the real world, how does this work?

I also work with the plain population, and I think again, they do have a lot of knowledge of newborn screening, mostly because of the cost, right? If that's a cost that they're going to have to bear, then they're thinking about it, and you may find that they're much more knowledgeable about the fact that this exists than maybe other families are.

So, I want -- I think this is great. I think it's just great that you have this data, but that's really what I want to hear is how do you see us getting this into the pipeline.

NATASHA BONHOMME: So, I'm happy to chime in on the funding piece of that. Of course, as a program, we're always thinking about

sustainability and what comes next. But, just like most of public health education is funded throughout this country, it goes back to federal and state agencies. And so, think newborn screening would fit right into that as well.

I think that when we see a vacuum of that type of education support, like we have seen in the prenatal setting, companies fill that space, and I know that's a whole other conversation, right? But I think we can follow some of the other really great examples and models in other public health education, particularly that have come from, you know, HRSA, CDC, you know, HRSA's Maternal and Child Health Bureau. I mean, there are great examples of long-term public health education support and validation of that. So, I think that, to me, that's where I would see a lot of that coming from, as well as then when looking at programs and thinking of all the other pieces of the newborn screening system that have to be implemented and supported, education should never

be a tack on to that, it should be part of that. So, I look at it kind of globally and holistically in that way.

MARIANNA RAIA: Could I just add one additional thing? Jennifer, it's a great question and I think we are -- we are asking ourselves the same question, what does this really look like to scale and to make it available to more. I think where we're really excited is that in partnership with state programs, as I mentioned earlier, states have reached out with interest of what does it look like to implement this at the state level.

So, I think we're just starting to ask that question and to really evaluate what that really looks like. But, to me, that would be the next step is to truly make this something that, at the state level, is something that could be implemented.

JENNIFER KWON: No, those are great thoughts, and I think if you have states that are implementing them, so sharing those success

stories would be very helpful for other states, but I think this is a great project. Thank you.

CYNTHIA POWELL: Scott Shone.

SCOTT SHONE: So, I actually raised my hand a little go to talk about the state's piece of it. So, I think -- so, Marianna, I'm glad the conversation has led there.

So, it sounds -- but it sounds like you're just sort of at the beginning of that work, and there's not really things to talk about yet. I mean, if you can share anything, that'd be great. Otherwise, I would encourage the future Committee to have you back to talk about it because I agree with Jennifer. Like these are best impacts, but again, if there's no answer on what's being done, I guess, I would ask you more philosophically.

We have often heard from our partners in the advocacy community that they feel they have to go state to state to make changes and newborn screening. Is that how education is now headed as well, that sort of the efforts at

the national level with sort of the national groups, ACOG, AAP, are not getting traction and that we have to take it more local, that newborn screening is truly local state based whether it's actual tests, determinations of panels, but also how we educate and engage in with our partners?

MARIANNA RAIA: Natasha, feel free to jump in too. I think it takes both. My personal opinion is that I think it takes both. I think it takes a national approach in terms of what information is being shared and how to do that and that it can be done. But it does take local effort, and I wouldn't even say just state, I think it truly takes effort at the local level as well. So, as much as I wish that it were a blanket thing across, you saw today that it takes multiple strategies, and some of those are at the local level.

NATASHA BONHOMME: Yeah. The only thing I would add to that is that it takes that really deep investment as well in terms of at each level, right? I think we've done a lot as a

community at the national level and it doesn't mean that everything has to be replicated, right? We don't want to say that every state has to create educational materials, every -- that's the point of these projects is to show models and to see what works and to not necessarily have all the focus beyond what exact words do we need to say, you know. We know what we need to say. It's newborn does x, y, z, newborn screening includes, you know, blood spot, heel stick -- blood spot, hearing, and pulse ox. You know, all of that type of information. It's there. It's really, how do we invest in those different models, again, at the state and local level, and we've been able to do that, as we shared a little bit with, with a number of different states and still are setting up some different programs because each state, as we've said for every other part of newborn screening, every state is different. Education would be the same on that front.

And so again, we are very much at

the beginning phases of that, and we really appreciate the states that have come to us and are looking for ways to partner, and for us to be able to be creative in that. And I think, you know, very soon we'll be able to say okay, these are the different models that we were seeing getting a lot of traction both through partnerships with state newborn screening programs, as well as on the clinical side of things.

SCOTT SHONE: I think, Natasha, it would be important not to just stress the materials, right?

NATASHA BONHOMME: Right.

SCOTT SHONE: And I think but like the structure, like is there a champion or champions, and how, like, what are the roles that we think of, because we can think of roles in follow-up and we can think of roles in the lab, but these educational roles that we might need to be developing or learn from other public health endeavors that need to be brought more routinely

the newborn screening.

NATASHA BONHOMME: Yeah, absolutely. And we didn't mention this, but in the first year of this program, we did a pretty extensive needs assessment and that didn't really focus on the content side of things, because we know that. We know what the content is, but really more so in the channels. So, how is this information presented, where does it need to be presented, and so, I completely agree with you that that is really the focus. It's the how, not necessarily the what.

CYNTHIA POWELL: Melissa Parisi.

MELISSA PARISI: Thank you. This is Melissa Parisi from NIH, and I just want to say that I really appreciated your presentation and I think that this is a really novel and important campaign. I have one sort of technical question and then one more philosophical question.

My technical question is one given that you were doing some pre- and post-test evaluation, did you end up administering this

under the auspices of an informed consent process? Was there -- were there any barriers in terms of your initial pilots, recognizing you probably had to have some champions among the practices that you approached initially, but wondering if you see that as a potential barrier in the future for this type of activity and being able to, you know, have buy in from the various practitioners that you wanted to apply the survey and the educational materials in the post-survey too. So, I'll stop there and let you answer that one first.

MARIANNA RAIA: Yeah. I'm happy to take that. It's a great question and one, yes, we gave a lot of thought to. So, in our initial pilot site, which was part of the University of Texas Health care System, it did undergo an IRB review process. We submitted it as a quality improvement project and it was approved as a quality improvement project, and we did not, by design, collect specific demographic information to reduce any potential barrier of, you know, of

participation or approval or things like that. So, when we've been able to replicate this in other places, we have not had to utilize the IRB process or a consent process because it's been integrated into the clinics care as quality improvement.

MELISSA PARISI: Great. Thank you. That's helpful information and probably alleviates some of those potential barriers.

So, my philosophical question is one around social media and the fact that, you know, as we know, social media can be both beneficial and have some negative repercussions. So, I'm just wondering if, in your campaign, if there was any attempt to counteract some of the negative messaging around newborn screening or some of the -- some of the challenging situations that have arisen by certain groups that feel that there are potential downsides to newborn screening or if that was not even a part of the equation, or you were just focusing on the positive messaging and the informational content of what you were trying

to promulgate.

MARIANNA RAIA: Great. It's also a great question. I will say for the 30-day campaign that ads themselves were, by design, quite simple. It was intended to generate interest and that was it. And so, all we were really measuring was can we -- can we take this message and get it somewhere. So, there was not a lot of negative response or anything like that, and it's too early to tell within the 6-month campaign if that will be an issue. But thus far, it has not been. I absolutely see the potential for that and it's a great question, one that we really need to think more about and haven't had to encounter at this point.

MELISSA PARISI: That's very positive. Glad to hear. Sorry, go ahead.

NATASHA BONHOMME: No, I was just going to say, the only thing that I would add to that is fortunately, or unfortunately, especially when it comes to any social media platform, the best and almost only way to combat information is

to flood the market with more information and more of your messages, and so that is something to think about as we think again sustainability for this program, what does it really take, right? And we know that other campaigns get millions and millions of dollars to really flood their market or their audience with particular messages. But I think that's something, like Marianna said, at the end of the six months, we'll really be able to look at more deeply and I appreciate that question. That hasn't been something we've dug deep on and we'll definitely add that into our work.

MELISSA PARISI: Thank you.

CYNTHIA POWELL: Debra Freedenberg.

DEBRA FREEDENBERG: Hi. So, I want to say thank you for this work. We are one of the states where, you know, LBJ is located, and I can tell you that as a state, we've made multiple attempts to reach the prenatal education aspects of this and invested quite a bit, and we really were not successful in reaching those target

families or the OB/GYNs. So, it's a great approach and hopefully, it can be more generalizable.

And also, the other issue that you also brought up is the retention of the information six months later, whether that's going to still be -- the families will retain that information or whether it's going to be kind of like a flash and then gone.

So, I just wanted to thank you for the work that you've done and, as you know, we helped facilitate it in the beginning. But you guys really ran with the ball and so, thank you for doing the work on this.

CYNTHIA POWELL: Cate Walsh Vockley.

CATE WALSH VOCKLEY: Hi. Cate Walsh Vockley, org rep from the National Society of Genetic Counselors. Marianna and Natasha, thank you so much for this work. It's really wonderful to see the program.

I am wondering, just a couple of quick questions, whether or not you have or had any

plans to reach out to the prenatal special interest group at NSGC to try and facilitate some work that Dr. Kwon alluded to the time constraints in that population in terms of providing services and how much they already need to provide patients. But it seems to me that if it's a sort of freestanding educational system, they might be able to help facilitate and implement it.

The other question I have is, I'm curious, I also work with the Plain community, I think there are a lot of us who do, whether or not you had resistance from some of the lay midwives in that population and to piggyback on that, whether or not you're familiar with the Plain Community Health Consortium, because I think it would be a great place to expand the program and I'd be happy to talk offline about that organization and what we might be able to do to help. So, thanks.

MARIANNA RAIA: Thanks, Cate. Natasha, I'm happy to take that one. So, to

answer your first question regarding NSGC and special interest groups. Yes, we have shared and again, this is a snapshot of resources that are available through this program. So, we have a tool kit that summarizes and encompasses all of our additional resources as well and I have reached out to the prenatal SIGs as well as the metabolic SIGs. So, we would love any partnership and collaboration to get these materials shared and if there's any interest in a more formalized pilot program as well, we would love to discuss.

Regarding the midwife resistance, I think we personally have not experienced that. However, I think that is because we are, to Dr. Shone's point, working with a champion in that community that is already connected to the midwife groups and birthing centers and a number of different -- and has done that work for some time, so back to our strategy of working with trusted partners that are already part of that community. That was integral to doing this work

successfully there. They have since reached out for additional information and there are additional midwives that would like to begin to utilize these tools in their practice and in their care. So, at this point, it has not -- we have not encountered that.

CATE WALSH VOCKLEY: I'm in the metabolic SIG. So, I'll put in a good word.

MARIANNA RAIA: Thank you very much.

CATE WALSH VOCKLEY: And I certainly would be interested in talking more offline. So, I'll be in touch.

CYNTHIA POWELL: Robert Ostrander.

ROBERT OSTRANDER: Hi. Robert Ostrander, AAFP. I have two thoughts, comments, one in terms of implementation. I'm not delivering babies anymore, but obstetrical care is very programmatic and structured and I think one of the keys or tricks to getting this implemented is through ACOG and AAFP and others that do training and the training programs to kind of have a link to the educational materials

for newborn screening on a little flowchart of what you do at your 32-week visit or whatnot because it's again, obstetric care in general is very much that way. At each visit or certain visits, there are certain things that happen. Your glucose tolerance test, your initial ultrasound, and if somehow that can get incorporated, it doesn't mean that the provider has to do. I think this is wonderful. I mean, because, you know, you're providing -- you're providing the materials. It's just a matter of if you can get it onto the flow sheet, you know, where they link it -- where that's an automatic thing, they link the patient to it, I think it'll happen. I've always been a big advocate for any of these changes to be sold heavily to training programs because even if you only get, you know, a small uptake in the training programs, once people are out, they're the young new docs in their practices and organizations and you tend to get a lot of spread, you know, from innovation to early adopters to being generally adopted. So,

that's my comment about implementation. Try to -- try to do everything we can to make it just an automatic part of something that happens at a certain visit during prenatal care.

My second comment is about Plain people. I have a large Mennonite population here. I'm in upstate New York and actually they're very aware of things just through the community and those of us providing general primary care to the Plain population. We've been able to promote and give them information about not only prenatal information about newborn screening but preconceptual. Probably you all know that the Strasburg Clinic -- The Clinic for Special Children in Strasburg that Holmes Morton started and Kevin Strauss is now running, has gotten a grant, I think, to offer they call the Plain Insight Panel, which does carrier testing for a number of the variants common to the Plain population, and there's been a pretty big interest actually in my patients in having that done usually, with a woman, once a marriage is in

place, and then, you know, secondary testing of the husband for any variants that have been found. So, again, I think the Plain population is particularly amenable to this. And as someone else mentioned, I think, in some ways, you know, maybe ahead of the curve compared to my other patients.

CYNTHIA POWELL: One thing I was wondering is, you know, we've talked before in the Committee and work was done and looking at the whole evidence review process, the nomination forms, things like that, is the values piece as we consider, you know, adding new conditions. And one problem has been that, you know, there's often not a group of diversified members of the public who are aware enough about newborn screening knowledgeable enough to, you know, get them up to speed during the nine months that the Evidence-Based review is taking place. Do you think that, you know, there might be some core of individuals identified through your work who, you know, might be available for something like this,

you know, to advise the Committee about how they think about possibly adding new conditions?

MARIANNA RAIA: Do you want to answer Natasha or do you want me to?

NATASHA BONHOMME: I think we'd have the same answer. I think, yes, you know, our Ambassador Program, in particular, has a range of different people who are interested in newborn screening for a range of different reasons. You know, many of them already have their condition on the panel and they really are thinking of things in terms of more systems-based and just kind of are in some ways more connected to the public and what does the public think. I'm not saying that they don't also wear a hat thinking about condition-specific issues, but I think that's one thing that's particularly special about our Ambassador Program. It really is about the whole entire system and really thinking about that. So, I think there may be some connections there that could be really helpful, especially since they've gone through a program that, like I

said, is focused on a broader system and thinking about what happens within a state program but also beyond that in terms of that clinical care, the follow up, really what does this mean for our family after the test and after a diagnosis, and all the different components that may go into that. So, I think that would be great, and I don't know, Marianna, if you want to add anything to that.

MARIANNA RAIA: Yeah. No, exactly what I was going to say, and also to say that some of our ambassadors have joined this call and shared public comments and things of that nature already. So, you know, I think I agree with everything Natasha said, yes.

CYNTHIA POWELL: Thank you.

NATASHA BONHOMME: Well, I will also say, I mean, as we're thinking about the public, I think sometimes we put all families into one bucket, you know, the public, advocates, patient advocacy groups, rare disease, here's all in on and just like anything else, you can't paint with

just one brush, right? There are different concerns, there are different motivators, and I think, as long as we're thinking about the diversity within those groups and what do we really mean when we say we want family input or we want public input and to parse that out and to realize just like there's no one clinician who can speak to all things newborn screening, there's probably no one parent that can speak to all things, but really taking all of those trends and putting them together. So, that's the only thing I would add to that as you're thinking about how to get that public, parent, family perspective involved at that level.

CYNTHIA POWELL: Right. Well, thank you both again for your presentations. This is extremely important and interesting work and we wish you all the best and hope to hear more in the future.

NEW BUSINESS

CYNTHIA POWELL: So, now we'll move on to time for new business. Do Committee

members have any new business or announcements they'd like to make? All right.

Well, the next Advisory Committee meeting will take place on August 30th and 31st of 2022. HRSA is very excited that we plan to have the August meeting in person. If there are any situational changes where we would have to shift our plans, we will make announcements on the Committee's website. Also, you can find a full list of meeting dates through 2025 on the website and the May meeting of the Advisory Committee on Heritable Disorders in Newborns and Children is now adjourned. Bye, everyone.

[Whereupon the meeting was adjourned.]