>> Okay, welcome, everyone. My name is Brenda. And I'm the room moderator. So if there's anything you need, I'll be in the back of the room. And so I hope you had a wonderful lunch. And you are ready for this session, the name of this session is Telehealth: Research Continues to Support Efficacy.

And our presenter today is Arlene Stredler-Brown. But before eI turn it over to her, I want to remind you to at the end of this session, please go to your app. And fill out the survey. Feedback is so important. So please take a moment to do that. So thank you, and enjoy the session.

>> DR. ARLENE STREDLER-BROWN: Thank you.

>> DR. ARLENE STREDLER-BROWN: So that's always a pleasure to talk about telehealth, favorite topic of mine. Let's get started. So I have a -- an intent behind these slides, which is to help encourage you, anyone you speak with, to examine or re-examine your attitudes about telehealth. And potential barriers to its use. And I have a few slides before I get to the research part to kind of set the stage on, um, why we -- many of us, myself included, think it's sometimes our thoughts about telehealth and how it measures up that is impacting its use.

So few years ago, these authors talked about how providers felt about telehealth. Notice it's 2015, before the world changed. And providers -- provider's feelings about telehealth fell into three categories. Excited. Maybe uncertain about how effective it would be. Unsure because they weren't sure how to conduct a session. And then a mix of those two.

Therapists who started using telehealth often got very excited about it. And in our field of early intervention, family-center early intervention with children who were Deaf and Hard of Hearing there were some literature that promoted this, although these quotes aren't directly from that. And what early interventionists were saying telehealth could be so different and yet so similar to in-person therapy at the same time. Or I saw as a provider new ways to practice. And new ways to practice is always very refreshing to me. Because that means you are individualizing and thinking about what you are doing and not necessarily doing the same thing over and over again.

Well, Colorado was big on the uptick of telehealth, why? There were some events that happened. The research I'll share with you was in Colorado. I was recruiting. I went to the park C director. We said we are on board. And they made part C accessible to everybody in early intervention in the state of Colorado. Developmental -- developmentallists, psychologists, social workers, interventionists, OTs, PTs, you had to take their training and you could deliver your service through telehealth. Totally supported and sanctioned by part C.

But after about three years of promoting telehealth at the statewide level for all kids, we had less than 1% of the children who were receiving services through telehealth. So we went onto explore why. And my colleagues I joined my colleagues to look at reasons people aren't doing telehealth. And I'm going to say a slide that's later right now. I'm not sure it's that different now. So back in 2019 after we surveyed providers, they said providers being service coordinators and interventionists they said telehealth does help with provider shortages. Families in rural areas. And it's great for rural. And there's some flexibility. Colorado, mountains, weather, snow, families on vacation made scheduling easier. How is my pace? Okay.

But these other issues persisted. And that is like the downside of telehealth at the time. There were technology issues. That was 2019, just four years ago, the world has changed. It was less perceived as less personal. And there was a perception that families didn't like it.

So we asked some questions of people like you. Which is do you trust the research that might move telehealth forward? And more globally, what assurances would you need besides empirical research that supports the efficacy of telehealth? So that was 2019. We published that. 20 happened. And as I said, the world changed. So here we are, 2023, three years later , practically to the day when things shutdown. And it's curious to me to see that we still have some of the same issues.

How many of you -- you can raise your hand or not or nod your head or thumbs up or whatever -- how many of you at some point in 2020 felt that telehealth or online virtual communication was a panacea? It was like a life safer. You could communicate with people not having to seem them in person. And people loved it. Right? A lot of people loved it and felt a lot of relief. Keep in mind that a lot of the move to virtual was by necessity. And opportunity. And comfort. But kind of got old for many. And now that we're emerging, it seems that people are reverting, and many people are reverting back to, glad that's over and now I can go back to seeing you. My guru here, Todd Houston is nodding his head. And people are saying I go book to in person. And this is where some of this empirical evidence has me so jazzed and excited. Because I don't want to throw the baby out with the bath water. I want to look at this as an opportunity, an alternative, um, and have it

be somewhat mainstream.

So does research support telehealth? I'm going to spend a lot of time showing you some research, what are the barriers? I think COVID fatigue, called it that, I don't know what you want to call it. But certainly the reliance on Zoom was an issue. But second the second bullet I think is the point and that is that I will say there was a deaf hard to hearing, birth to 3 there was a lot of funding for telehealth, specifically with the Otercoter foundation that was funding a lot of situations across the country pre-COVID and those people were comfortable with it, they had training, those providers. But all the people who saw telehealth as some kind of a saver savior to us during COVID who jumped into it with both feet it was not a savior, it was an opportunity. We needed some training.

I'll give you a personal story. My husband and I we audit classes at the University of Colorado. And we were in a psych class when the university shutdown and went virtual. And this professor who was very good, big lecture hall and very interactive with the students who sat in the first 15 rows of this lecture hall. And he went virtual and he lost that interaction. He didn't know how to gain that interaction. And he certainly didn't have the time to take all the courses that the university was making available to all the professors so say here's how to do it virtually because they were too busy making a switch and dealing with their families and whatnot.

So this lack of training either before or while doing it I think is part of the issue with the utilization the continued utilization the sustainability of telehealth. And in addition to research, I'll go into some avenues that I think relate to advantages presented by telehealth. So let me jump into this study. It was an NIDC study. We applied our group Jim and Arma and the group and the co-PIs were part of the team. And we jumped in this for NIDC and went for a research study and they gave us a experimental trial. And none of us and even my esteemed colleagues that Jim and I knew has been funded for a clinical trial. So you'll see some of the limitations of this study based on the fact that the government in their wisdom, I might add. And I'll is save that punch line for later gave us a task that was very difficult to fulfill. But fulfill it with we did. We had a primary hypothesis. We said it was the null

hypothesis that we were going to compare kids in person intervention telehealth intervention, and we are going to say the outcomes of the children the developmental outcomes of the children will be equivalent, non-superior, not inferior, there'll be equivalent outcomes.

The secondary hypothesis was we are going to test -- no, yes, we are going to enroll and test, treat for six months -- more about that later -- test again six months later . And we'll look at change in speech and language outcomes from the children in the two conditions.

We'll look at global language. We are going to look at vocabulary specifically. We are going to look at functional listening skills. That became difficult. And we are going to look at speech articulation. We had an additional hypothesis. And I think this helped us to get the grant because it was all about the brain and Sharma's work. And we are going to look at the equivalent sei of the kids in person and in telehealth and their P1 cortical potentials and I'll give you a speech-language pathologist short course on the brine science work.

Our primary end point was children's performance on the PLS. Receptive language, expressive language, and total language. When we were funded by the government, we were funded for telehealth not for Deaf and Hard of Hearing kids receiving telehealth. They wanted a clinical trial to look at telehealth and we were influential in making it about deaf and hard of her kids because we were interested in that population.

So accommodations to the study. Took a year to accommodate our proposal to a clinical trial. Why? We said that we are going to start -- so many things. Okay. For similarity we said every child will be seen by a LSL certified verbal therapist or educator. For similarity we said every child will be in both the telehealth condition and the in-person condition with the same interventionist. For the clinical trial the children were going to be randomized. So they say, yes, I want to join. And we would randomize their assignment to telehealth first, in-person second or in-person first or telehealth second. Are you starting to see any problems why it took us a year to get over some of these hurdles. And we started saying they would be in each condition telehealth and in-person for 9 months each, so in the study for 18 months. I am guilty for that one. Because the kids were going to be young so I wanted to give them a lot of chance, 9 months worth of

intervention.

We had a change each of those things. Families said, no, no, you're not going to randomize me and my child to a condition you are studying that we don't yet know has equivalent lens. If I'm in an area where there's a LSL, a Listening and Spoken Language specialist and a certified auditory verbal therapist, a certified auditory verbal therapist, L LSL S, Listening and Spoken Language. AVT, auditory verbal therapist, auditory verbal educator. I'll keep using those acronyms.

If a family will say if I can see my LSL therapist in person I want to do that in person. Or if the family was in a rural area they would say yes, I'm all about telehealth but I really can't commute 180 miles from one side of the Rocky Mountains to the to the other to be in the in-person condition. And it was a deal breaker and we had to deal with our project officers to not cross over and not have everybody in both in-person and telehealth.

We couldn't randomize because parents said, I'm going to pick or I'm not going to do it. I get that. And we shortened it to six months. We did remain blinded. With the exception of people who managed recruitment, me. Consent and enrollment, me. All study personnel, who were administering tests, scoring tests were blinded to whether the child was in telehealth or in-person therapy.

Now, about the LSL therapists. We didn't have enough. They are very popular in our state and we only had five. They couldn't see 100 kids, which is what we were aiming for. So we needed to recruit other early interventionists whom we vetted for their knowledge of and adherence to family-centered early intervention practices. And teaching children how to listen and talk.

They were not certified. I can't say they were equivalent. But or they lived by the nine ten nets of LSL's therapy. But through interview and a form that we had, we felt we had appropriately trained people but notably not certified which is a whole other level of commitment and practice with family-centered intervention and spoken and listening language.

You see in a later slide there's some limitations to this study. What did bedo? We ended up having three sites. The State of Colorado listening and talk in seated l. And the Memphis oral school in Tennessee.

We did baseline testing and these were the tests we did. Where am I? That's too difficult. So preschool language scale that was our primary outcome measure. For vocabulary, younger children we used the McArthur, kids with more vocabulary we use the pea body picture test and the expressive vocabulary test.

For children who were old enough we used the Goldman for articulation. We did the P1 cortical test after all -- all at baseline. They had treatment for six months and we gave all those tests again six months later.

The children that we were recruiting for 6 months to 6 years of age at the time of enrollment. So if they did cross over they would be in intervention for a year.

So they would be 7 by the time they were done. We started out with only children who had cochlear implants. Unilateral or bilateral that was in our protocol. Because we wanted their hearing differences to be similar among them.

However, we couldn't get enough children with implants to buy into the study to our project officer after a lot of discussion said, okay, you can have kids with hearing aids also. Has to be bilateral hearing loss at the moderately severe to profound degree.

Kids had to have one or two implants and/or hearing aids. The family needed to commit to listening in spoken language. So you see we are still looking for that unanimity that similarity among everyone but we keep making exceptions.

Um, some of the families did use some sign. I would call it sign supported speech. So when I'm interviewing the family and they are with the child and I'm with them for an hour and an hour and a half and I see oh yeah they are learning sign language and in an hour and a half they use two signs that's not a huge commitment to sign language, listening and spoken language was the commitment of these families.

We did exclude children if English was not their primary language. Because our tests were not all translated into any language. Some to some degree but not all of them. If you had a significant cognitive deficit, more than one and a half standard deviations from the mean, you were excluded because then your speech and language development would be compromised.

Most likely. And if there were significant comorbidities, autism, cleft pallet, things that would effect speech and/or language development, you were excluded. So here's how it divided out.

We had 40 children -- let me say the this number of 70 we recited more than that. I think we recruited 88. It might be in a slide here. We had 70 children for whom we had enough complete data that they are included in this report. So we had 70 children, 40 were in the telehealth condition, 30 in the in-person condition.

I had that backwards. Right? 40 in-person, 30 in telehealth. And then it's broken down by state. Colorado had the most kids. We started earlier and Seattle came on later. And Memphis came on right after them.

The mean age of the children at baseline. I was a little disappointed about this. The mean age for kids in person was 46 months for telehealth, 43 months we'll call it. So in the 3-year range. I wanted the babies. I wanted to see language development from the get-go. So why is this? Think about it.

I'm going to give you the answer. What was happening in Colorado and in many states I think is Part C, pace for early intervention until a child 36 months of life. This grant gave them another opportunity for another year of intervention, 6 months or a year so families said sign me on, I want more intervention for my child. So we got a emphasis on preschool age children. Not too many babies. And some older kids but that's the spread. That's the mean.

Gender played out in-person blue, equal pretty much female, male dividedded out a little bit differently. It's just of interest.

Type of amplification. This is significant. For the in-person condition, the 40 kids in person, almost 1/2, 48% had implant, an implant or two. For the telehealth condition, 36% had implants. Hearing aids, in-person, 40%, telehealth, 57%.

And a combination one ear with an implant, one ear with a hearing aid, 12% in person, 7% in telehealth. Therapy sessions for scheduled weekly. We had low cancellation rates. We told them to do an hour session. This is what we came up with. More like a 51-52 minute session.

And drum roll, is there a non-inferiority? We'll see. So the primary outcome measure was the preschool language scale. Acronym, PLS, 5th edition. And this is the auditory comprehension subtest. And, um, the P-0 value is 0.05, it's not statistically significant, which basically speaks to similar outcomes for in-person and telehealth. You see the same for the expressive subtests. Again, insignificant statistically, even visually. And the total language score again, insignificant statistically, the kids on the primary outcome malpractice the PLS basically did the same with the terms of the progress they made whether they were in the telehealth condition or the in-person condition.

So our null hypothesis was supported. There is no difference between child outcomes in the two treatment conditions. This is a nice little finding when you're having your statistics people analyze data. In 6 months time, the average growth on the PLS was nearly 9 months in both conditions. So these kids made more than 6 months growth in 6 months time on average they made 9 months growth in 6 months time. And wow, didn't we feel good about that? After 7 years of wondering.

So I'll save time for questions at the end. Um, secondary outcomes. Other test results. Here's the McArthur words and gestures subtest. It's the first vocabulary measure of our battery that you can give in terms of the young east children. It's a parent-completed questionnaire. And we had 19 kids who completed that vocabulary checklist.

And look at these P-values. Anything more than 0.01 is insignificant. And this is way more than 0.01. 0.76 total in significance in the terms of the difference in standard scores between kids in telehealth and in person. You'll see the raw scores look different. That's because there were more words with the way the ages of the kids played out. But still the P-value was insignificant.

Um, yeah. Let me go to the next slide. Same test. Words and gestures but this is expressive vocabulary. And again, the P-values are insignificant, even though you see the numbers with standard scores and raw scores being different it's not statistically different.

I'm going to save a little time and not do that slide. As the kids got older, we gave the peabody picture vocabulary test to measure receptive vocabulary. And we have the blue bar for, um, in person. And orange for telehealth.

And these illustrations are interesting. And again, insignificant difference from a statistical point of view. So we looked at expressive vocabulary. This is where you show the kid a series of pictures, what is this? You name it. As opposed to parent interview you test a child. 50 kids, no statistical difference in their development.

Switch to speech, switch interpreters.

[Laughter]

Speech articulation on the Goldman test of articulation, we had two tests that David Ertmere developed for the edge younger children but we didn't have that much younger children. So I'm giving you the Goldman results on 43 kids. And the statistics is insignificant in the two groups. So a difference in cortical potentials.

Can you show me with the hand raise if you know what that is? Cortical potentials, P1. You keep me honest, I'm not an audiologist. If there is a misstep, men.help me, please.

I knew Sharma was excited about this study and well as funder the government. Because we are looking at the brain and nothing is more subjective than the brain, well at least a lot of people think so. We look at how the brain has responded to a listening function, not hearing, listening.

So Anu Sharma to cut to the chase developed some guidelines for what's within normal limits. If you look along the horizontal axis -- let's see if I can do any better with this. Ah. Okay. So this is normative data. In years. Birth, 2 years, 4 years, 6 years, et cetera.

And this is the P1 latency, which is how the brain responds how quickly or slow the brain responds to a stimulus. And there's norms for how the brain would respond at different ages. That's why you have this band here. If the little blue dot falls within the band it says, here's the range of within normal limit in how your brain responds to an auditory stimulus.

If you are outside these two bands, you're not within normal limit for your age.

How did I do? Am I okay? No missteps? Thank you, excuse me.

So this was a small study, oops, sorry.

This was a small study. From kids early on in the study. And that's why some of these lines are longer and some are shorter.

Any longer line is a child who is in the condition. Blue for in-person, red for telehealth. And for 9 months A shorter line is 6 months. Every line is an individual child.

You want what we are looking for within that band we want responses to be within this band. And the interesting thing here, this is the start of this child. This is after 9 months of intervention, moving in. this one, a little bit of an outlier, moving forwards within normal limits. Look at all these kids after 6 or 9 months of intervention, this one started within normal limits and ended within normal limits and this one is heading in the right direction.

We got excited the brain is registering the listening and spoken language work that's been being done and you can we hope listen better. And what was significant was the impact of the intervention.

What wasn't significant is that whether you were in person or in telehealth, you had similar outcomes.

Here's another preliminary study, same idea it's represented slightly differently.

You want to be the way this slide works, here's the age of the kids. Oh, I'm sorry, this is PLS not corticals, I have a slide that looks just like this. This is another way of looking at the PLS. But early on individual kids. And you can see that what you want here on the PLS is you want to be as close to this line as possible. Here's the start of intervention. Ah, they are even better than that line. Or above age, above age, below age. Moving in the right direction.

Moving in the right direction, oh, way moving in the right direction, no progress, I wonder who that was. Moving in the right direction above age level on PLS. And for the most part, moving in the right direction on the PLS was just 21 kids, we saw significant effect of therapy beyond the effect of age. In other words, more than 6 months growth in 6 months time. And the average improvement in age in that small sample, it wasn't 9 months of growth in 6 to 9 months time this was 10.5 months growth of a 6-month period.

So excuse me, we were pretty happy about that. And oh , no effect of in-person or telehealth.

So I mentioned some of the limitations. We had 70 kids. We wanted 100. Kids didn't cross over, they didn't get therapy in both conditions for the most part, only one condition. We didn't randomize. Not all of our providers met the same standard of LSL certification. The concentration of kids around 3 years of age wasn't as diverse as we hoped.

Different degrees of hearing loss. Had it been implanted kids early everyone would have severe to profound but not we had moderate to severe, severe to profound. And different types of amplification. And some kids that used some sign which is different than using no sign from a research perspective.

I won't go into this as much. But you know how I said we had a test for speech for the little ones and then the little older than the older ones and then we use the Goldman Fristo? From pre to post-testing sometimes kids switched tests because they made progress whether vocabulary or speech. The PLS is the standard it goes up to 72 months. That's why it was our primary outcome measure. When you go to analyze pre and post, you really want to use the same test like we did with PLS. But if you did the McArthur on the pre-test and the Peabody on the post-test we re-administer the McArthur and they are too old for it. And it was a bit of a challenge for the statisticians.

I want to talk a little bit about coaching because I think that this is a huge impact on the utilization of telehealth. And by that, I mean, telehealth influences coaching. And coaching is part and parcel of family-centered early intervention.

As opposed to the child centered model, where I grew up in a clinic started at a university, took the kid. Parent was in the waiting room. Maybe behind a one-way mirror. It's an interventionist, I worked with the child. Just because you are in the home, you could still be child.

Centered or you could be family-seventhed. You have to change your paradigm. And my words, treat the parents as your clients not the child if you are going to use a coaching model. It's hard to do. Especially if you weren't trained to do it, either in your pre-service train organize in your in-service training. I know there's some breakout sessions in instructional sessions on coaching because people are still learning about it.

So the question in my mind is this. Is telehealth unintentionally supporting coaching practices? Well, who's actively engaged with the child? If the interventionist observes more, does that mean the parents are engaging with their child more? And if parents engage with more with their child is there more likelihood after your session that you will continue to practice what you learned?

In the week until the next session? So we made this assumption that all of our interventionists were familiar with and employing experimented with family-centered intervention . And that means the interventionist explains what they are going to do and they might demonstrate what they are going to do. And they solve problems not just by telling the parent there's a problem, here's how to solve it. But reciprocally involving the parents in solving the problems.

The early interventionist will observe a lot. So they can offer feedback to the caregivers.

And with the caregiver, the interventionist will reflect on a session. And when you get really good at coaching you just do all of these and you move back and forth through all of them.

Now, what we did find when we analyzed video recordings of a sample of our 70 kids is that parents participated in the session in the telehealth condition 80% of the session. In person, the parents participated in the session 55% of the time. Not using any statistics here but that's a big difference. And maybe I would be guilty if I went into a home and I worked with a child and I will model something just to demonstrate how to do it. And then I'm on a roll. And the kid is going great. And I'm playing with the child. And the parent is watching and I'm intently working with the child and I'm expanning and working on speech or language or whatever.

And 8-10 minute go by and I realize, oh, I just -- I'm beyond modeling. I'm doing some child-centered intervention. Where the intent would have been to model and turn this over to the parents. In short order. So things like that will impact how much time a parent participates. Not to mention the parent, some parents years ago saying I'm so glad you're here I'm going to do the laundry. And my response to that is let's all do it together.

Not on my first session, I wouldn't do that that. But once I get to know the parents.

We know from this study the parents are more involved. So back to the question. Will more parent practice in a telehealth session lead to more frequent implementation of the strategies they are learning? We didn't look at any outcomes for that but that's where my mind goes in asking the question.

So I wanted to spend a little time before I let you make any comments or ask any questions on coaching and its value.

One is, uh, well it's my dissertation. Where I was seeing in the telehealth condition that providers, interventionists observed more, gave more feedback to the parents about what the parent was doing when they were playing with their child. And gave more feedback to the parents about their child's development.

So they are teaching them about their child's learning.

In the telehealth condition, all three of those behaviors on the part of interventionists were statistically significant. Take my word for it. You don't want to read 254 pages. Um, Melissa McCarthy in Australia has done audiologist work if you don't know her. These are no longer in review. My apologies for not updating these slides. But she found in telehealth there's more evidence of, same thing, providers on commenting on parent's specific use of strategies and parents making more decisions. So you say, okay, so we are going to work on expanding your child's communication from one word to two-word utterances let's just say.

No, I'm going to go -- well, and then you might say, how do you want to go about that? What room of the house do you want to be in? What activity do you want to do? Parent gets to have input into that decision

Better yet, or equally good, you might go into a session and say, so what do you want to work on? So parents need a prompt and you say, you know last time we worked on language. And we worked on some speech sounds and some listening skills. Um, what do you want to do today?

If I gave parents choice, I know they will pick their top choice. So I learn a lot about the family when I say, what do you want to work on? In terms of what is meaningful to them or what they think their child needs to work on on.

In the telehealth condition McCarthy found that caregivers made similar conditions in those scenarios and she found in the telehealth condition looking at the role of provider versus parent, that in the telehealth condition the majority of the interaction in a session was between the caregiver and the child.

Not the ear early interventionist. Where the in-person condition it was the opposite. More frequently it was the interventionist working with a child that dominated the session.

So I can't emphasize this more. If you are going to look at the third question I postulated, then there's more coaching happening in telehealth. So that's in the presentation. You can get to that. There's more documentation. There's lots of it.

Um, what are we going to do? What are we going to do about changing people's attitudes? Was the research at all compelling? You are all sitting here, it must have been interesting. But does it affect your notion about telehealth with yet another empirical study that says, hey, kids are doing equally well.

Well, yeah, but we're still as I said at the beginning coming out of COVID a lot of relief, let's go back to whatever normal was. But this term in this field right now it would be in-person intervention.

And I'm saying, you know there's a lot of benefit to telehealth. Provider can see more kids. Kids from rural areas can have access to whatever kind of specialty interventionist they want. Whatever communication strategy they are seeking. The weather thing. Um, but it doesn't work just because you want it to.

We skip the training in terms during COVID in terms of going online and being comfortable with the technology it gets better all the time. But observing colleagues. I was just talking to a colleague of mine who lives on the eastern slope of the Rocky Mountains and she's 100% working with kids on a rural area on the Western slope close to Utah. And 100% of her intervention is virtual.

And she said it's all I can do but I wish I were in person, it would be different, for her as an interventionist.

I said what would possibly make you comfortable if we could provide it? I'm the EHDI coordinator for Colorado so we can take this to our task force and do work on it as a state. And she said I would like to see someone doing it. And furthermore I would like to talk to that person about doing it. And I want to do it. And I want to record one of my sessions. And I want someone to look at it and tell me what I did right and what I could do different. And how I could be better. What she was lacking, I've never seen her do therapy virtually. She's lacking confidence for one. So and I as an EHDI coordinator in saying we can do that.

Why couldn't we? We have the resources. You have to shift things around a little bit. So we have to develop resources, thank you. We need to consider these topics for training. Which were published in 2015.

So that you can be comfortable and good at it. If we're comfortable with telehealth, we reduce barriers to access. How many visits in Colorado were canceled this year if they were in person because of snow? A lot. We have a lot of snow. And illness you can work through illness whether a provider or a kid, a cold, that kind of thing. With telehealth, you save must be. You probably have more sessions so you don't save money. But when someone drives two hours of a visit, hour visit maybe hour and a half because they drove two hours, two hours back, they'll see two kids in a day, maybe three. With telehealth, you can see whatever your comfort zone is.

Um, this could be a short course. And it's going to be two sentences. Specialty providers, if families choose listening and spoken language, you want them to have access to listening and spoken language. If they yews use a bilingual inn support we need access to ASL instruction. If they want a combination of those two in any way, shape, or form, we need providers who can do that

If you live from Greely to Boulder to Denver to Colorado Springs you can find a provider who can do all those things. Not the same provider but a provider. If you live in the rest of the state which is half of our population is in the rest of that state. Not on the corridor of the front range of the rockies you have one provider in your community, and they usually know way. Because in their pre-service training they usually learned one way to communicate with kids.

Telehealth overrides that for anybody and every.

We found in our survey before COVID, Cole and me that care started quicker with telehealth. Didn't have to arrange a site visit. Didn't have to drive. Talked about that.

Interpreters are relatively easy to access. They don't have to drive. Maybe they cost less, I don't know. If you were to record sessions, you can actually start a whole do it yourself training that's an element of professional development. Record your session, how easy is that using Zoom or another platform. You can watch yourself. If you had a mentor you could watch it together. The technology of course is no longer a barrier.

And family members who were not at a session can watch the session, the recorded session. And you got to get over some obstacles of, let's say mom and grandma are at the session. Dad's going to watch it later and mom and grandma have to feel okay about dad watching them. And you have to work it a little bit. But it's way belt better than whoever wasn't at the session and coming home and saying how was the session today? Good, what did you work on? We were working on two-word utterances, maybe end conversation. Where is the demonstration? Where is the discussion?

I told you I would told you at the end what your project officer said. This is when we applied for our experimental grant. And we were given a clinical trial. And he said, 2013 is when we were rewarded the grant. He said wise guy, telehealth is going to happen. The government needs to have some regulations about what it's going to look like.

Go for it.

Those words couldn't be truer. Telehealth happened. I just hope it's not in the past tense. And those are some references.

Now, to all of you. Comments or questions, either.

>> [off microphone]

>> Hearing first hands experiences for distance we have done Melissa McCarthy, there are evaluation methods, there's mentoring under hearing first and it's all free.

>> DR. ARLENE STREDLER-BROWN: Thank you.

My state will be -- who do I contact? Okay.

>> Thank you, thanks for a great talk. Can you tell me how you screened for your non-LSL providers?

>> DR. ARLENE STREDLER-BROWN: If you could send me your email address to use.

>> Did you find a difference between the LSL and non-LSL providers?

>> DR. ARLENE STREDLER-BROWN: Yes.

>> Okay, thanks.

>> DR. ARLENE STREDLER-BROWN: I'll share one thing with you about that.

>> I actually have a question. I'm curious to know if in your state you have audiologists that can do like the telehealth with the families and the children on technology. Because we don't have that in Minnesota. And I know that personally from my experience and my grandkids. They have to drive two hours to have the mapping done on their cochlear implants and things like that.

>> DR. ARLENE STREDLER-BROWN: Okay, so I'll do these three questions. Yes, we had an interview form. For the non-LSL's therapists. To be honest, I knew a lot of them. So I had seen some of their work. But that's not good enough. We had a form. We did not accept everybody.

Um, I will share that we did a fidelity study to look at how all the therapists compared to your second question. And we did of course because it was so convenient to do it look at the LSL certified and the non-LSL certified interventionists.

This has not been published but hey, we are among colleagues so I'll tell you. We base the fidelity study on the 9 tenant of LSL's therapy , 9 or 10? 9. And we divided it into listening, speech and language, and being family-centered. There was no difference in the two groups. And their utilization of speech and language strategies maybe it says we interviewed well, I don't know.

There was no difference in their work on listening. There was a difference in their utilization of family-centered early intervention strategies. To your question about Minnesota.

As you can imagine, I'm a fan of teleaudiology as most states we have this rural population I keep talking about. When we have not had teleaudiology, when COVID started we applied for grant to start teleaudiology, it was an AMCHP grant. American maternal child health programs. That equipment would have purchased -- that grant would have purchased equipment, ABR. And then we were going to add to that hearing aid fitting, cochlear implant mapping. The sky is the limit.

We were very fortunate, we are very fortunate in Colorado. We have educational audiologist in every school district in our state. They volunteered to be the person on the remote site who is hooking the kid up to doing what in some states is a volunteer or a deaf educator or a nurse or whatever.

We love the model. We weren't funded. Children's hospital of Colorado is willing to be our host site. They are the only site that wants to be the host site. Which is great. We still have our educational audiologists remotely. We identified the site where we want to start. It's the corridor on the West -- in the mountains starting at Aspen goes down valley all the way to Gle nwood Springs for a underrepresented area for pediatric audiology.

We are they ever along, we know this will not be a cost benefit to the hospital. They will spend more money than they recover.

They have done that work. But they are all about outreach. So they said maybe. They are working it.

So everything is in place except for what is ABR equipment cost? 70,000, 80, about 40,000. Plus supplies and whatnot.

So we are -- we need the resources. Our HRSA funded EHDI grant doesn't have that grant. We need that money. Parents are on board. Can you imagine getting among the best of the state and the only one who said they wanted to be the host site being the audiologist from afar, the concept is fantastic.

We learned a lot in case you want to pursue it too from the MJAM telehealth audiology learning community. There's a lot of work on what states are doing, who moved beyond our point in time.

So I do think that's going to happen too. And I think it's going to grow. But it's easier said than done.

Thank you all for your attention. And interest.

[applause]