(THEME MUSIC PLAYS)

SPEAKER:
You're listening to Everyday Evidence presented by the American Occupational Therapy Association, helping the occupational therapy practitioner apply evidence to practice. Here's your host, Matt Brandenburg.

MATT BRANDENBURG:
Today I am joined by Dr Amy Darrah and Mary Rebecca Trucks. Amy is a Professor and Director of the Occupational Therapy Division in the School of Health and Rehabilitation Sciences in the College of Medicine at the Ohio State University. In addition, she directs the Injury Prevention and Rehabilitation Research Lab, and leads the pilot studies arm of the National Institutes of Health PL2 National Pediatric Rehabilitation Resource Center. Amy, you also recently served as Chair of the Research Committee for the American Academy of Cerebral Palsy and Developmental Medicine, and are a member of the American Occupational Therapy Association Academic Leadership Council. Mary Rebecca is the Senior Occupational Therapist at the Neuromotor Research Clinic at Virginia Tech's Fralin Biomedical Research Institute. Mary Rebecca was a part of the first-ever randomized controlled trial of pediatric constraint-induced movement therapy, and is a leading expert in providing this intervention.

MARY REBECCA TRUCKS:
I will, and I should have said this before, it's the Fralin Biomedical Research Institute. And I don't know if that messes you up, but I wanted to just jump in there.

MATT BRANDENBURG:
Thank you. I appreciate it. My hard and soft days just aren't on their A game today, guys, I'm sorry. (LAUGHTER)

MARY REBECCA TRUCKS:
All is well.

MATT BRANDENBURG:
Amy and Mary Rebecca, we're so excited to have both a content expert, accomplished researcher, and skilled clinician on the show today. And I just wanna thank you both for taking the time to be here.

AMY DARRAH:
Thank you. Happy to be here.

MARY REBECCA TRUCKS:
Now, we're looking forward to the discussion.

MATT BRANDENBURG:
Absolutely, me too. I'd really love to discuss your work on an NIH-funded efficacy trial examining pediatric constraint-induced movement therapy. A paper on this was recently published in the journal 'Pediatrics' and will be a major part of our conversation. But before we dive into that paper, I wanted to ask if you could bring me and the listeners up to speed with a couple of questions. If you could provide us with some background on constraint-induced movement therapy, what really is it? How would you explain this intervention?

AMY DARRAH:
Well, pediatric CIMT is an intensive rehabilitation approach that was initially based on CIMT for adults with chronic stroke, and then adapted for children. This approach is distinguished by constraint of the less impaired or unimpaired upper extremity, high and concentrated dosing of therapy, and then the application of operant conditioning and motor learning techniques to elicit and then shape new movements and new skills. We in the CHAMP Study that we're gonna talk about today, we actually tested a signature form of this pediatric constraint-induced movement therapy called ACQUIRE. And that includes several key or essential components, constraint of the less affected upper extremity, as I mentioned earlier, high intensity. In this study, we compared 30 hours in a month to 60 hours delivered in a month. It includes that shaping, repetition, mass practice and feedback delivered by very specifically and highly trained therapist, provision of therapy in a natural setting, parent engagement, what we call a transfer package or a transition plan.

And then each therapy dose is followed or completed with three days at the end of that four weeks of bimanual training that does not include any constraint. Mary Rebecca, did I capture that? Do you wanna add anything?

MARY REBECCA TRUCKS:
I think, you know, the big question for a lot of people is what goes on during a treatment session. And I think maybe some people think that constraint-induced movement therapy, especially with kids is just intensive occupational therapy. And that's really not the case. I mean, while OTs are well suited for this, it is truly a behavioral approach. So, as Amy was saying, my job as a clinician, when I go in with each child is to determine what movements and functional abilities I'm gonna work on. And I choose activities that are motivating so that I can engage them in that process. And while I'm doing that, I'm encouraging them and showing them that their hand that's involved, that they really didn't think was able to work, can do things and it's helpful for them. And as they are successful, I'm giving positive reinforcement. If they're not successful, I am redirecting and giving them another opportunity. But I am constantly looking to reinforce in a positive way that they can use their hand.

And the more they discover that I'm able to gradually increase what I'm asking, it's the behavioral term of shaping, where I increase the demand and reinforce them as they're trying, again, to teach them that their hand is useful with the ultimate goal of being useful in the context of bilateral activities that they need to do and activities that they enjoy doing.

MATT BRANDENBURG:
That's a wonderful explanation. Thank you for the introduction to this intervention. It sounds like this approach that you were studying is so robust, and this trial was so robust as well. I know typically I've heard constraint-induced movement therapy used more in adult populations. What really motivated you to study its effectiveness with children?

AMY DARRAH:
Well, interesting. There is a large body of work supporting pediatric constraint-induced movement therapy. However, these existing studies vary in two key areas or on two key variables, dosage and type of constraint. So, the goal of the CHAMP Project was to examine these particular factors of dose and constraint type systematically, so that we could understand whether different combinations of dose and constraint would yield, improve performance over usual and customary treatment.

MARY REBECCA TRUCKS:
We know that little ones have such neuroplasticity and they make changes quickly. And so, I feel like that was an addition to the CHAMP Study. And then also just thinking about, you know, P-CIMT is so widely used, like Amy was saying, there is such a large body of evidence for it. And so, just to add with the gold standard randomized controlled trial evidence to provide clinicians with treatment protocols that we know have the evidence to support those protocols.

MATT BRANDENBURG:
I love that. I love that motivation to increase the protocols and add to this wonderful research base of a very interesting intervention that I think can be helpful for so many people. We've mentioned the CHAMP Study a couple of times, I just want to give the full name of that study for our listeners. It is the Children with Hemiparesis Arm and Hand Movement Project, CHAMP for short. Is there anything else you want to add by way of introduction to CHAMP?

AMY DARRAH:
I guess we could just clarify. It's a factorial randomized controlled trial that is examining to those two critical aspects of pediatric CIMT dose and type of constraint. And we just really wanted to understand the effect of these variations in pediatric CIMT treatment protocols on motor outcomes in children ages two to eight with hemiparetic CP.

MATT BRANDENBURG:
Amy, you're also a part of a Phase III clinical trial examining intensive pediatric constraint-induced movement therapy, also funded by NIH, and an additional efficacy trial apart from that one called Baby CHAMP. Would you like to speak to those studies quickly before we dive into the CHAMP publication?

AMY DARRAH:
Sure, and I will open by saying Mary Rebecca is heavily involved with these studies as well, so I'm sure she will be able to comment. So, I'll start with Baby CHAMP, that was a Phase II randomized controlled trial funded by NIH that examined three types of constraint in P-CIMT for infants and toddlers with hemiparesis. That trial, which occurred at Virginia Tech and the Ohio State University is concluded now. And we're working on analyzing the data. Our current clinical trial, the Phase III clinical trial you referenced is called I-ACQUIRE, and that is funded by NIH through StrokeNet. Our team is led by Sharon Ramey and Warren Lo and includes investigators at Virginia Tech, Nationwide Children's Hospital in Columbus, Ohio, and Ohio State. And it also includes investigators at our imaging core at Stanford, Data Management and Analysis at the Medical College of South Carolina, and then the StrokeNet National Coordinating Center at the University of Cincinnati. And then we have 14 sites across the country that are delivering this intervention and working on collecting data.

I-ACQUIRE is as you can see a massive trial. And what we are doing in I-ACQUIRE is examining the dose of P-CIMT in infants and toddlers with perinatal arterial ischemic stroke. Mary Rebecca, do you want to add to that?

MARY REBECCA TRUCKS:
No, I believe in short, Amy, that you really covered the details with Baby CHAMP and I-ACQUIRE. And I think we're just, I'm thrilled to still be a part of the research and the clinical evidence moving forward.

MATT BRANDENBURG:
I'm really impressed with how large in scope these studies are. And I think it definitely adds to the amount of, trying to think of the right word here, the amount of trust that we can put into the research that's being conducted, and knowing that it is covering so much, and these are big studies that can really help guide clinicians. Let's go ahead and dive into this, the topic of today, the paper titled ' constraint-induced movement therapy for Cerebral Palsy Randomized Trial'. This is a randomized controlled trial which is the strongest experimental research design one can conduct. Could you briefly describe what a randomized controlled trial is? And why you want it to conduct this form of research specifically?

AMY DARRAH:
Well, a randomized controlled trial, it is a rigorous study design that allows us to attribute outcomes to a particular intervention. And we do this through rigorous control of internal validity, strong outcome measures, lots of planning. We selected this approach because it is arguably the best way to examine treatment efficacy, meaning that we have confidence in our finding about how these particular variations in pediatric CIMT dose and constraint impact motor outcomes. So, I think it was really about the strength and rigor of this approach.

MATT BRANDENBURG:
Thank you so much. I love talking about research design as much as anyone else. This was a multi-site trial. I think you mentioned that a lot of work has been done at the Ohio State University and Virginia Tech. Is that where this study was being conducted as well?

AMY DARRAH:
Yeah, this was conducted out of Virginia Tech, the University of Virginia and the Ohio State University.

MATT BRANDENBURG:
I didn't know UVA was involved as well. Mary Rebecca, did you have any bad blood between those in-state rivals at all?

MARY REBECCA TRUCKS:
(LAUGHS) You're so funny. So, I'm originally from Birmingham - Birmingham, Alabama. So, mine was all about Auburn and Alabama. So now, UVA and Virginia Tech, I mean, of course, I'm a hokey, but you know, that's because that's where I work, but no bad blood. (LAUGTHER).

MATT BRANDENBURG:
Good, good. Happy to hear that.

MARY REBECCA TRUCKS:
Tell me that's off the record. (LAUGHTER). You're really helping us relax. And those easy, like the football comments, I can give you that all day.

MATT BRANDENBURG:
You know, we might need to have you back on the show and we'll just do a football-specific episode.

MARY REBECCA TRUCKS:
Oh, my word, my brothers would love that.

MATT BRANDENBURG:
Yeah, Amy might put us the shame being from Ohio State, they've got a pretty good program there too.

AMY DARRAH:
We do. I gotta say, it's the truth. (LAUGHTER).

MATT BRANDENBURG:
Back to our paper now, what were the doses and constraint types of CIMT and the usual customary treatment that you compared?

MARY REBECCA TRUCKS:
So, I will go ahead and tell you, the doses were both 30 and 60 hours. And the 30 hours occurred for three days a week at two and a half hours each day. And the 60 hours was three hours a day for five days a week. And for both of those, it was over the course of four weeks. Before I move on to the constraint type, I'll cover the usual and customary. And those children who were enrolled in the usual and customary groups continue to receive and report on their traditional therapy services over the course of that four weeks. In regards to constraints, we actually had two types of constraints. The first one was the long arm cast that we have used in the ACQUIRE Model, and that runs from just beyond the fingertips to just below the shoulder, and it puts the elbow at 90 degrees and the hand in a functional resting position. And then we also used a resting hand splint. And I should say that the cast stayed on for the entire duration. We checked that once a week to make sure skin integrity was as it should be.

And the splint was put on at the start of therapy for each day, and removed at the end of therapy for each day. And again, all of this was over the course of four weeks.

MATT BRANDENBURG:
Right off the bat there, I have a follow-up for you. Mary Rebecca, as a clinician providing these types of interventions, is one of those constraint types a little more practical, or is there one that you favor over the other?

MARY REBECCA TRUCKS:
The cast is really helpful. And the cast is helpful because it goes on the first day, it does not come off until the next week. Of course, if there were any co-safety concerns, we would check. But it remains constant. And so, the child is able to settle into the process. We put Coban or Coflex wrap over the cast, and so it looks continuous like it cannot be removed. Again, if there were an emergency, we would have directed the parents how to remove it. But just the cast being left on and allowing the children to settle in really is helpful. So, clinically, there might be a day or two where you have to redirect and draw their attention away from the cast. And that varies with each child. But with the splint, it was very difficult to go in each morning and say, "OK, we're here to have fun. And by the way, let me stop and put this constraint on you really fast, and then we'll do treatment, and then I'm gonna take it off." So, you're asking them to constantly readjust versus allowing them to settle.

MATT BRANDENBURG:
That's a great insight. Thank you for sharing. This study included a sample of 118 two- to eight-year-old children with hemiparetic cerebral palsy, who were assigned to one of five treatment groups and given assessments at baseline end of treatment and six months post-treatment. What were the five treatments that were provided?

AMY DARRAH:
We had, if you will, four treatment conditions that we controlled. We had the high dose, which was that 60 hours within four-week dose with the cast, and a high dose with that splint. Then we had a moderate dose, which is the 30 hours over four weeks with the cast, and a moderate dose with the splint. And then the fifth condition was the usual and customary treatment.

MATT BRANDENBURG:
Perfect. Thank you for breaking down the methods for us. How did you determine what assessments to use and to track?

AMY DARRAH:
The assessments were selected based on which assessments were going to be best able to measure motor performance in this population. And we did use a combination of parent-reported outcomes and assessor sort of standardized assessor-delivered outcomes.

MATT BRANDENBURG:
And do you wanna provide an example of some of the assessments that you were using? What they were called? Where they fall on being the gold standard for measuring function?

AMY DARRAH:
You have opened a can of worms with the gold standard comment (LAUGHS). Because I will say that across studies of pediatric constraint-induced movement therapy, there is tremendous variability and range of assessment instruments that are used. But what we used was the Assisting Hand Assessment, Peabody Developmental Motor Scales, the QUEST, which is the Quality of Upper Extremity Skills Test. And we did have some modifications so that we could score this for research purposes. Then the parent questionnaires, we used the PD CAT, which a lot of OTs are familiar with. And we also used the Pediatric Motor Activity Log. Alongside this, it's probably worth mentioning as well that we did measure parent stress as well just to understand how parents were feeling while engaged in these kinds of interventions.

MATT BRANDENBURG:
Absolutely, I think that's a wonderful factor to include, and it can have a lot of influences on health outcomes. Sorry for opening up the can of worms. As the host, I'm here to muck things up sometimes. (LAUGHTER).

MARY REBECCA TRUCKS:
Notice my silence amidst all of that. (LAUGHTER).

MATT BRANDENBURG:
How were OT practitioners involved in treatment and assessment throughout this trial?

MARY REBECCA TRUCKS:
We trained occupational therapist for the treatment, and we also trained occupational therapists for the assessment protocol, which was a blinded process. I was actually part of the training as well as Stephanie DeLuca and Dory Wallace, my colleagues, and was also able to implement the treatment on this, and it did involve, and it does involve, we really want to stress specialized training in order to be able to implement the protocol with high fidelity.

MATT BRANDENBURG:
What does that specialized training look like? How long does it take to be certified or ready to provide this intervention?

MARY REBECCA TRUCKS:
So, we have learned throughout the process of COVID, as there have been positives and negatives with that, that it really does take some distant distal online training, as well as in-person training. And I wouldn't say that there is necessarily a strong, hardcore exact number of days, but what we have found from our experience is that at least three to four days of in-person training on top of that online portion is very important. And then of course, continued monitoring and scoring fidelity to make sure since this was a multi-site trial, that therapists were providing the same quality of therapy across sites.

MATT BRANDENBURG:
I love that extra effort that you put forth to really ensure that things were maintaining consistent across different sites and across practitioners, Mary Rebecca, follow-up for you, how does being a part of a major randomized controlled trial influence or change your approach to treatment and assessment during your day-to-day?

MARY REBECCA TRUCKS:
So, this is really interesting. My career in OT has been pediatric constraint-induced movement therapy from the very start. So, I have been fortunate enough to, I was part of the first randomized controlled trial years ago and then had been part of the ongoing gathering of clinical evidence over the years. And so, this trial was different for me because previously we had offered the dose of the six-hour that the ACQUIRE Model is known for. And so, this was a decrease in dose. And the splint was also changing it up because historically in the ACQUIRE Model, we have always used the cast. So, it was interesting for me to see the progress that the children made with the three-hour dose. And probably as you can tell from my previous comments, I was not a fan of the splint. I would prefer the cast over the splint any day, just because it allows the child to really focus in on what they're doing without the distraction of here is your hand that you always use, and now I'm gonna take it away.

I will say that I do really appreciate that we are able to put forth a research protocol, implement that, gather the data and see, OK, based on these results, this is how we need to move forward. So, I did enjoy seeing how the children progressed in the three hours as well.

MATT BRANDENBURG:
Absolutely. I thought that was very eloquently put. Mary Rebecca, I think anyone who works in pediatrics understands the importance of decreasing distractions when working with our children, of course. And I think this is a great segue to begin talking about some of the results from this study. I think it's important to start this part of our discussion by sharing that children of all experimental groups experienced objective gains. But I do want to ask what dose and treatment combination led to the greatest gains for participants in this study?

AMY DARRAH:
Yeah, and you do range, you bring up an interesting point and raise an important point, and that is that all of our groups did show improvement. But the group that demonstrated the greatest gains was the high dose. So, children in the high-dose group, regardless of constraint type, experienced those greatest gains.

MATT BRANDENBURG:
That's wonderful to hear. And regardless of the constraint type, so the children are experiencing the same amount of gain. But with Mary Rebecca has incited, it does sound like maybe the cast is easier on providers or clinicians in using constraint-induced movement therapy.

AMY DARRAH:
Though, it's probably important to note that parents did not express a preference for cast or splint. So, it was one of the things that we did, we did ask parents.

MATT BRANDENBURG:
That's awesome. That's awesome. And parents were trained in how to follow through with these after discharge and things like that.

MARY REBECCA TRUCKS:
You know, that's a huge piece of the transfer package that Amy was mentioning earlier in the definition of P-CIMT. And each parent was given a transfer package, and it included skills that their child learned over the course of the four weeks. But it also included some activities to continue working on as they return home, activities that are unilateral, but more importantly, activities that are bilateral with the ultimate goal that we are teaching these little ones that they have two hands to use, and also teaching these parents that it doesn't have to be time where you're sitting down and pulling teeth and making your child do an activity, it can be just a natural part of the day.

MATT BRANDENBURG:
I love that. That is the most OT take on constraint-induced movement therapy. And I've just got a huge smile on my face. Mary Rebecca, what really is it about constraint-induced movement therapy that led to such positive outcomes on visual motor integration, dissociated movement, and parent-reported functioning in this experiment?

MARY REBECCA TRUCKS:
So, I have to say on this one, a really, really short answer is that it was a result of the principles being applied by a trained therapist and with a high fidelity and hardworking little ones and supportive parents. So, that is the short of it. And I can tell you from, again, I'm gonna take it back to the behavioral approach that we really believe in when it comes to P-CIMT. And so, I have little ones that come in with just a broad range of ability. And if I have a little one come in, who does not realize they have an arm and hand, then the first thing I have to do is to reinforce to them behaviorally that that arm is part of their body and increase the desire to use that arm and hand. And then once they start using it and they're engaged and they're really bought into the process, then I can, as I mentioned earlier, start to increase what I'm asking of them. So for instance, if I have a little one that doesn't know that they have that arm and hand, I might be ecstatic over them, just moving it and reaching forward towards the toy for the first time.

So, let's say it's their right arm that they're using. I would say, "Oh, that's a good job reaching with your right arm and hand. That's so good." And then I would repeat that. And as they are 70 to 80%, so I'm talking about shaping here, successful with what they're doing, then I'm gonna increase, I'm gonna increase the range that I'm asking them to move. I'm gonna increase and change the position. So, you're looking for therapists who are highly trained, who can take in all those pieces, you know, is the child really engaged and enjoying what they're doing within reason, right? Because it is therapy. And then as I see them improving, I'm gradually increasing what I'm asking, constantly drawing their visual attention to their involved arm and hand, I'm doing that through my verbal cues. I'm also giving a tactile cue, as I might say, "Good job with your right arm." I'm tapping on their right arm just to let them know that that's what I'm talking about. So, it really is just the implementation at a high fidelity that involves those principles that define constraint that Amy was talking about earlier.

That's the long answer.

MATT BRANDENBURG:
It's a simple formula to really know the principles of the intervention, well, deliver it with high fidelity and have hardworking clients and good support systems. But I mean, that can lead to astounding outcomes. I can imagine. How would you recommend, Mary Rebecca, that clinicians or practitioners really know the principles of CIMT? How can they learn those better and prepare to deliver this type of intervention?

MARY REBECCA TRUCKS:
I think it really comes down to, if you're interested in P-CIMT is maybe looking at online resources or manuals. I know AOTA produced a manual in 2013, it was the P-CIMT Handbook on constraint. And that includes evidence-based both the ACQUIRE and modified versions of constraint. But I really, really wanna emphasize the importance of that in-person training, and monitoring, if possible, to make sure that you really are including the behavioral components that we talk so frequently about as part of the process.

MATT BRANDENBURG:
Absolutely. Thank you so much. What do you both hope that occupational therapy practitioners who work with pediatric populations take away or gain from this research?

AMY DARRAH:
I think for me this kind of research demonstrates that we can preserve highly individualized goal-directed family engaged intervention while implementing a treatment protocol with high fidelity, meaning we can still adhere to those essential components of the protocol, but meet our kiddos where they are. I think it's also really important for practitioners to trust the standardized assessments that they administer, but also the parent reports that they receive because the assessors in our study and the clinicians out in our hospitals and clinics and communities around the country are administering an assessment and seeing that child performing at one point in time, whereas parents are seeing their, their children performing over time in their natural environment in the context of sort of the rhythm of daily life. And so, I think that's, it's so important for us to understand that, that parent partnership. So, maybe those two things.

MARY REBECCA TRUCKS:
I will say too, that it reinforces, I hope to everybody that children can tolerate the intensity and they can tolerate it because of how we engage them. So, we might do direct play where we're sitting and doing, but we're also including meals as part of the process when it's appropriate and we're including dressing. And so, you have someone who is directing a child's day, but that is what children are accustomed to is some direction in their day. So, even though it might be difficult to maybe visualize what that intensity looks like, and what actually happens as a therapist when you are sitting on the floor, is that children can tolerate that and do quite well with it.

MATT BRANDENBURG:
Absolutely. I love that so much. I know sometimes it can be tough for new grads, especially to kind of get used to delivering interventions in more of a medical-type setting. But I love how this trial really shows how you can provide evidence-based interventions that also are improving functionality and are touching on the cores of what OT practice really is. I wanted to follow up with working with parents and caregivers. How would you recommend practitioners work with parents and caregivers to encourage more carryover and those lasting positive outcomes?

MARY REBECCA TRUCKS:
I think it's so important for therapists as they can within the session to teach the child specifically how to use their involved arm and hand in a way that's gonna carry over to how they might do that in bilateral play. And just to remind parents, again, as I was saying earlier, that integrating that involved hand throughout the day and as a natural part of their day is really the ultimate goal. We don't expect for parents to constantly cue the child's involved hand, that would be incredibly challenging for everyone. But again, just to, for the occupational therapists to encourage parents direct them, "Hey, you know, this is how you might consider using two hands throughout the day." I think is OTs, we have a lot of knowledge that we take for granted. And that knowledge is useful. And it's oftentimes what parents don't think about, and they need our direction for help with that. And then also if the child they're seeing on their caseload has been through a constraint-induced movement therapy program, hopefully, they have a transfer package and they can direct them to that transfer package for continued practice.

MATT BRANDENBURG:
Absolutely. Is there anything you wanted to add there, Amy?

AMY DARRAH:
Just to build on what Mary Rebecca said so beautifully is that one skill that we have as OTs is to examine the sort of the natural flow of the day and the everyday activities that families engage in every day, and really work with families to identify ways to integrate all of these therapeutic activities into those everyday activities, into that typical daily context and daily flow. Because I think that is how we practice. That's how we learn. And that's how families who are busy with many, many pressures and time constraints and roles and responsibilities can take this and follow through effectively, right? If it's fitting into their daily lives, then it becomes something that feels very natural and feels very much a part of their sort of typical pattern.

MATT BRANDENBURG:
What would you say are some of the most important considerations for clinicians when deciding to implement constraint-induced movement therapy intervention in their practice?

AMY DARRAH:
Yeah, I would say this is a wonderful addition to a clinical practice, but it is a highly specialized treatment approach. So, I think for occupational therapists to feel comfortable and confident in delivering this kind of intervention, some specialized training would help them feel confident that they're delivering this sort of high-quality intervention. I would also recommend assessing whether the clinic or setting that they're working in is able to support this recommended dose and adherence to these active ingredients or essential components of the intervention.

MARY REBECCA TRUCKS:
I will say quite simply, creative play is so huge. And I think that sometimes we feel like just pulling out a toy means that we're playing. But if the child is completely bored and looking away and giving you a lot of behavior, really playing and engaging them in the process, so that what you're doing through pediatric constraint-induced movement therapy is helping them to be a part. And you're really a team in that process. So, really finding your creativity and going back however many years, I won't give an exact number on me, but remembering how you played as a child and encouraging that as part of the process.

AMY DARRAH:
That is so important, Mary Rebecca, because we are asking these children to do something that's really hard for them. And in many cases it's really new for them. And so, finding those creative, fun, playful ways to motivate children to hang out with you and work on the hardest thing they've had to do is a really important next step.

MATT BRANDENBURG:
Absolutely. I love that recommendation. Thank you so much. But I wanted to ask if there was maybe a clinical example or story of when you're able to implement pediatric constraint-induced movement therapy very creatively, or help a child really achieve an awesome outcome.

MARY REBECCA TRUCKS:
You know, I will say that some of the best treatment examples are when you follow the kiddos' lead. And all of the therapists who I have worked with and who I've trained over the years know that my go-to activity is bouncy balls in the bathtub. And I can take it back to, I know the exact child in my mind, and this child was around a year old, and we were just having a day, right? Like when you're doing upwards of three to six hours of therapy a day, you really have gotta have some, either great activities or you've gotta put on somewhat of a show, right? As OTs, we all know that in pediatrics. And so, we were having one of those days and I thought, you know, something that I totally enjoyed as a kiddo was rolling marbles in the bathtub, and also bouncy balls. And so, I will, of course, safety first, I will hold the little ones on my knee and let them drop the ball into the bathtub and just watch it bounce. Because as a kiddo, that's fun, it's engaging. So, I think some of the most rewarding activities for me, or rewarding moments for me as a clinician over the years have been when you're working on a skill or a movement, and you're waiting for it, you're waiting for it.

And all of a sudden, even if it's just a first reach, when they realize that they have that hand and they can use that hand, it's chilling, right? Because the process is working, but you're giving them such a gift. I mean, imagine thinking that you had a hand that just didn't work. And all of a sudden, through the process of what we're doing with P-CIMT, you realize that it works, and how exciting that you can use it for, yeah, the stuff that this therapist is asking you to do that sometimes drives you crazy. But for things that you enjoy, like blowing a kiss to your mom and dad, or giving a high-five to your brother or sister, I mean, it depends on, I don't know, maybe hitting your brother or sister is a better example on that, but it depends on the child. But just to see that process and to see them develop skills that come along with that intensity and the fidelity of that process is just incredibly rewarding in terms of my work.

MATT BRANDENBURG:
Absolutely. Thank you so much for sharing that example. I do have to apologize if you can hear leaf blowers in the background. There's just a lot of leaf blowing going on in my apartment complex today. And I'm confused 'cause we live in a desert, so I don't know how manys leaves there can be out there.

MARY REBECCA TRUCKS:
You know, I have to say if I had $1 for every time I had been doing therapy and the people start to do the yard work and the kiddos get so distracted, and all you can do is just acknowledge that and try to move on. But yeah, that's no worries.

MATT BRANDENBURG:
Awesome, thank you. Amy, was there anything you wanted to share along with that?

AMY DARRAH:
Well, that example was fabulous, but speaking to this idea, this sort of magical moment that the child realizes that they have this hand that they can use and interact with the world is also something that we hear echoed by parents whose children are suddenly performing all of these activities that they have never done before. And so, we see it in the children themselves, and then we hear it from parents who just Marvel at the moment that their child was able to feed themselves, or able to play with a LEGO, or wave bye-bye, as Mary Rebecca said. So, I think it really is such a family-centered approach because parents are so engaged that we can celebrate all of these wonderful improvements and gains with the children as well as with their families.

MARY REBECCA TRUCKS:
Amy, I think that's really important because a lot of times I think parents are fearful. They've been told that the child might not use their arm and hand. And so, I think it's a safe place to have those expectations and to celebrate those accomplishments throughout the process. Yeah, their involvement is crucial.

AMY DARRAH:
Yep.

MATT BRANDENBURG:
That's one of the things I love about occupational therapy is the benefits in health outcomes aren't always demonstrated in lab results or on a standard assessment but are seen in improved functionality and being able to perform these life skills and life activities that really are so impactful for the whole family. So, it's wonderful to hear those examples. Thank you both so much for sharing. We only have two or three more questions. What would you recommend to practitioners who are working in settings that may not have the same means for casting, splinting, or implementing a constraint-induced movement therapy intervention that was included in this study?

AMY DARRAH:
Yeah, that is such a challenge for the field of rehabilitation. And by challenge, I mean translating research protocols into clinics because we vary so much contextually in terms of the practice model, the setting, the sort of culture of the site. So, this is a constant challenge I think for occupational therapists. For this particular approach, constraint is an essential component. High dose is an essential component. So, I think that for occupational therapy practitioners who are not able to fabricate or access a constraint, or who work in an environment where this dose may not be possible, they may consider working with families to identify specialty practices where this is offered because there are sites around the country that do offer this. The alternative is to really start advocating for your families, with the clinics, with insurers who are funding your work using the evidence from randomized controlled trials to argue that actually, this is the model that we do need, we do need to get extra training in fabricating constraints, we do need to deliver an intensive model of therapy if we're going to do this right.

So, I think there is a role for occupational therapists as advocates for families by using the research and using these protocols that describe the essential components necessary to achieve the results to articulate why it's important for these kinds of services to be reimbursed. Did that make sense?

MARY REBECCA TRUCKS:
It absolutely did. It absolutely did. It was well said. And I mean, because what you're saying is just to follow the evidence and acknowledging too, that it's difficult. It's so different to be in a strictly research setting where you're following a protocol that's funded versus being in the system and trying to figure out, yes, I know I want to provide my clients with that intensity, but how can I work within the system to do that? So, but what I hear you saying in that, Amy, is to redirect and refer. If you can't offer it with the evidence, with what we've put forth, you know, the CHAMP Study is an example of an evidence-based protocol to please refer elsewhere to people who might specialize in that.

MATT BRANDENBURG:
I love that. Thank you so much for the recommendations. We've mentioned a couple of times the importance of being trained prior to providing this intervention, what additional resources or training materials would you recommend to practitioners who want to be able to incorporate CIMT into their intervention toolbox?

MARY REBECCA TRUCKS:
I know that AOTA published the Handbook for P-CIMT in 2013. And I am sure they have short courses online that are centered around P-CIMT. That are both modified and signature forms and are evidence-based. And so, I would say to read those. And if you're interested in in-person training is just to reach out to a facility that offers that training so that you can get the in-person piece of that. That's so important for implementation of those, the principles, specifically the behavioral piece of it.

AMY DARRAH:
I would echo that. And I also want to maybe articulate that, even though we are talking a lot about specialized trainings, and making it sound like this is a very, very challenging. It is also something that is, that occupational therapists do really well with. When you go through the training and you start to gain these really specialized skills in P-CIMT, you also begin to recognize how well this aligns with the basic tenants of occupational therapy around sort of play and motivation and family engagement and environmental context and just right challenges. All of those features of occupational therapy come into play in this intervention. So, I would encourage occupational therapy practitioners listening to us to seek it out, to seek out the training and see if it's possible to implement, because it is worth it.

MATT BRANDENBURG:
Absolutely. Thank you both so much. We are to the final question of this interview, this is called the Golden Nugget Segment. And I wanna ask each of you to share a golden nugget as a response to this question. If there was one piece of advice or recommendation that you can make to OT practitioners, what would you say?

MARY REBECCA TRUCKS:
I would just encourage the overall thought that kiddos can do it. And if you're creative in the process, they want to do it if you give them the opportunity. And just also thinking in terms of teaching them those unilateral skills with the ultimate goal being that they can use two hands for the activities that they enjoy, not only now, but as they grow into adulthood, and to follow the evidence. And hopefully, the CHAMP Study is really helpful in providing that evidence.

AMY DARRAH:
I 100% echo that. Mary Rebecca, that's well said. I think if I done my researcher hat just for a moment, I think my recommendation would be to really encourage occupational therapy practitioners to identify those active ingredients that are leading to the improvements and function that we see in research studies and randomized controlled trials. Learn what those are and how they relate to the outcomes we see so that we can more clearly articulate what it is that we are doing as occupational therapists, that is making a difference. So, yeah, so I think it really is about evidence should be driving practice. And we know that translating evidence into practice is a challenge. But the more able we are to recognize and understand, and then integrate those active ingredients from those tested protocols into practice, the more high-quality outcomes we're going to see. Yes, that would be my hope.

MATT BRANDENBURG:
Awesome. Thank you both so much for sharing those nuggets. I think it's a wonderful way to wrap up an interview that was full of golden nuggets as well. So, thank you both so much for your time. It was a pleasure having you on the show.

AMY DARRAH:
Thank you so much. And would you mind if we just took a quick moment to acknowledge our team, 'cause this is a highly interdisciplinary team who's worked really hard together for many years to build this research program. And I think we'd be remiss if we didn't mention some of our co-authors, Stephanie DeLuca and Sharon Ramey at Virginia Tech. Rich Stevenson was another one of the principal investigators on CHAMP, he's at University of Virginia. And Mark Conaway, our brilliant biostatistician also at University of Virginia. And then, of course, we have to acknowledge our local team at Ohio State and at Nationwide Children's Hospital, Dr Warren Lo at Nationwide. And then this study was launched at Ohio State by Jane Case-Smith, who we lost too early, many years ago, as this trial was just getting started and we miss her and we attribute so much of this work to her brilliance and pediatric expertise.

MATT BRANDENBURG:
Absolutely, absolutely. It takes a village, right? And you guys definitely had an all-star team, so huge shout out to everyone involved.

MARY REBECCA TRUCKS:
This has been wonderful. I really appreciate the opportunity. I keep thinking of those gold nuggets as Hershey bars that are wrapped in gold paper.

AMY DARRAH:
Oh, that sounds delicious.

MARY REBECCA TRUCKS:
That's the visual I got when you said gold nuggets. (LAUGHTER)

MATT BRANDENBURG:
You know, Hershey's actually makes a candy that's called Hershey's Nuggets. And they come in like, they look like little Treasure Chest, and some do have the gold wrapping. Those were staple in my house growing up. Oh, wow.

SPEAKER:
Thanks for listening to Everyday Evidence. Tune in next time for more evidence-based practice insights and applications. (THEME MUSIC PLAYS)