# Impact of Motor Learning: Clinical Evaluations, Assessments and Interventions

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- [Fawn] Now we're going to move to our third part of this series on autism. This course is the Impact of Motor Learning: Clinical Evaluations, Assessments, and Interventions. Again, we have Lisa Roehl and Mariah Woody, and Lisa's gonna start us off.

- Hello and welcome back to this course in regards to our evaluations and assessments, you can read our disclosures again. And so we're just gonna briefly go over the learning outcomes. So you can see what we are going to discuss during this presentation. In general, participants will be able to identify at least five different standardized tests and protocols for the evaluation, assessment of the child with ASD. For application, for both the OT and PT, participants will be able to recognize baseline goals for the application. Again, for both the PT and OT, participants will be able to identify at least three frontline treatment interventions for whole body coordination and motor learning. Participants will also be able to identify and implement at least three advanced treatment interventions for the progression of praxis and participants will be able to identify the impact of motor learning through direct observation of intervention techniques and documentation examples. So we're just gonna check in a moment to make sure that we're all coming together from where we were previously. So we've talked over motor learning theories, we've talked over the ICF model and how that plays into things and how we structure, how we look at our patient population. And then we also really progress into praxis. And that's kind of the heart of what we're looking at. So with praxis how does that affect our patients with ASD and how do they learn? I'm gonna give a second for Miss Mariah to catch us up on anything from her portion.

- So if you all will, please make sure that you have the pyramid of learning pulled up still and pull up any notes that you had taken from praxis. We're gonna be going into various interventions. This is gonna be so fun. We're gonna review documentation and if you all have any questions throughout this, please feel free to email us.

- So as we start in, hopefully we're getting out from that pillow, were not crashing. So as we get going, we want to kind of take a step back and say, what are the general outcomes of testing? Why are we doing testing for these kiddos with ASD, first and foremost, that's what we're called to do within our practice, because insurance is asking for that as well as families. And parents are wanting to know, can you give me some concrete, some objective information. So children with ASD received lower scores on multiple standardized tests of basic motor performance compared to typically developing peers. So we want to see is where is that delay coming from? Is it a true gross motor fine motor delay? Or is it that they're not understanding the protocols of the tests? So as we go into our testing, examples and ideas, taking that into consideration, and how do we relay that information out. Children with ASD also demonstrated both spatial, so incorrect body positioning and body part to tool interpretation, as well as temporal. So poor movement timing, and increased time to initiate a movement. And we also see the opposite, too fast of a time to do something.

So whether it's taking them too long to understand your direction or they're jumping before they've even heard the command. So what we're seeing is that they're having a hard time with that imitation, that praxis. How do they interpret what it is that you're asking them to do. We know with standardized testing, you have to follow a very strict wording, a very strict level of intervention to help them. You can only give them so many trials. You can only show it to them once, you can't verbalize how to do it, you can't touch them. You can't help them. And so when we look for children with ASD of how we can do these standardized testing, what is the best way to implement that? So we're gonna kind of think about that as we kind of go through some testing, we also know what is the general expectation of the testing. So let's take a brief moment when we were called back to the ICF model. So again, are we looking at a test that is looking at activities? Are we looking at a test that's looking at impairments or we're looking at a test that's only focusing on participation. So we want to kind of think about if I want my kid to have this type of outcome. I need to think about what tests that I'm implementing for them. So if I want them to participate in their environment, it's not to

their advantage or my advantage to give them a test that only looks at activities because that's not gonna give me a true idea of how they're participating in their environment. We're gonna go through some different tests. Some that only look really good at activities and some that look more at participation. So how do we look at that? We also want to think back to our motor learning theories, in general, is the body and brain ready? Has it developed to that point to take in that information, have we learnt to take the test? Now, a lot of my patients with ASD will memorize the test. So if I do the same test every year, even though I'm only doing it once a year, they have learned the protocol. So when we get to that point, what are other tests or other ways that we can assess that patient, provide truly objective information.

And again, that dynamic theory, how do all these tests come together? So you want to think, what is the intent of your test? What is your intent for the test? Again, insurance may be asking you information, but insurance, a lot of times now is coming back to us and saying they want more standardized tests and less questionnaires, questionnaires can become very subjective. So we want to make sure that we're giving the information to insurance, simply for the sake of us being able to practice as well as what is it that we're trying to get out of this. So again, that parent input and relevance. Does the parent care if the kid can stand on one foot for 10 seconds, the parent may be more caring about can the child put on and off their pants. And they don't have to sit down to do that. You know, my child is 15 and they're leaning on me to put on and off their pants. So that's where PT and OT come together. So kind of, again, what is the parent input and relevancy? Why are we doing this test? Again, kind of back to old school, criterion reference versus norm reference? So just a refresher for all of us, criterion reference is looking at a pre and post test format. So you're comparing to yourself, norm reference is referring to a reference to an age or a standardized score. So kind of keeping that in mind. So as we look at standardized testing, one reference that you can see here as I've referenced the APTA there's some lists here of a bunch of different tests to be able to use for children with ASD. Again, anything we speak about here, or even in reference to the APTA, it's not a comprehensive list. It's just simply a

list of testing that you might have access to, or you might have the availability to use, or would benefit from using. So the first test we're gonna talk about is the BOT. So the BOT is a great test. It's a reliable and valid measure of both fine and gross motor performance. It has a broad range, and so it's from four to 21 years of age. What's great is it's a standardized test. It's a norm reference. So it's not taking into consideration a four year old being compared to a 21 year old. So it's gonna give you a kind of an standardized score that's in reference to their age. So a four year old should only be doing these things or a 21 year old should be doing a lot more. As we look at the BOT, we're gonna test all these things, you can see the eight sub tests. So we go anywhere from agility to balance, to coordination as well as some upper limb, we're gonna look at some visual motor and some upper limb speed and dexterity. So you're gonna see all sorts of components. This test is really suited best for the child with ASD, who functions at the higher end of the spectrum. There is a lot of protocols that they have to follow to be able to complete this. In general, this test can be given within a typical hour evaluation, but really what you want to see is, it's very strict on what you are allowed to intervene with and not allowed to.

So again, that higher level, it also gives you two trials to complete the task. What's great for that is, as you look at that, you can see, as I did my basic explanation, you have a card that shows them what to do. Did they learn to the second trial? So that's something that I always bring forth in my information. So when I'm writing my assessment and talking about the tests, how did they do on the first trial versus the second trial? Did they fatigue, that shows me endurance, or did they learn what to do after practicing it the first time? So children with ASD also demonstrate dyspraxia. So an impaired performance of that gross motor or that motor gesture during imitation. And so sometimes also they have that during tool use that cannot be wholly explained by their deficits. So again, it's that motor planning. They're not sure of what you just asked them to do. They only heard the last command. I want you to step over this line, back and forth, and all they heard was back and forth. And so they may not have understood the command with the BOT. You have generally a manual that sits there

and you can look at those pictures, but again, you want to consider is the child even understanding my commands. So I'm gonna let Mariah speak on the OT portion of the BOT too.

- So along with that auditory command, keep in mind if a child has an underlying auditory processing disorder, make sure that you look up in the manual exactly how to follow the test, you know, make sure that they have the visual in front of them because a lot of our praxis children need that visual, that auditory sequence doesn't always come through. Lisa touched great on the difference between the first trial and the second trial. And I want to hone in on that a little bit more, especially for our OTs. When we get more and more into our fine motor skills, is in the second trial, how did we, did we do better? Did we do the same? Did we do worse? And that's gonna tell you a lot about what they need to do for their other functional tasks. Do they need a prep or do they need to quickly get something done the first time and don't drag it out? It's really gonna tell you a lot about the kid, also from a sensory perspective and a postural perspective, what are they doing when they have to sit at the table? Do they sit there and hold their head up while they're flipping their cards? What is their breathing and the respiration like, did they hold their breath? What is their mouth doing? Do they have a lot of oral overflow while they're doing some of these fine motor tasks? What is their stability system like? So even if you're not taking a standardized assessment of a sensory profile for OTs and our PTs, it's really important to work together and saying, "Hey, this kid has a lot of postural instability". When we refer them over to PT, they fatigued very quickly in their trunk.

So if PTs, for some reason, don't pick up on the trunk instability, we can and that's important to carry over because that's gonna hold us up. That's going to let us know about our body schema. Do we need extra input to be able to attend to a task? And that's really important to understand the core underlinings, going back to that pyramid of learning that I asked you to pull out. What's before, even our praxis in motor coordination, it's sensory and reflexes. So you always have to look at what is

happening in the sensory system, along with doing non sensory system tests. You can really get a good amount of quality data in there. Okay, so now we're gonna take a look at some documentation and I'm gonna let Lisa talk about hers first.

- So what we see here, I have a documentation example of a family that gave me permission to use their information. So this little boy, which you want to kind of take into to consideration as you read this, is that he was originally evaluated a couple of years prior to this. This is 2018 information. He was evaluated in 2015. He was about seven years old. And so again, you can see what Mariah spoke about, where it talks so that, what does he look like? We look at his behavior. So what we can see here in this first part that he presented with a history of variable behavior and tolerance for directed non-preferred physical activities. Okay, so anything he perceived as challenging, he wouldn't do. So as we pick up on this, we can see, he was unable to be included in the BOT-2 the year before. And he was tested with the Peabody, but the Peabody, he was older than the Peabody. However, that was the most appropriate test for him at the time. So again, you want to draw the information, are we improving just in our ability to follow commands. You can also just kind of see, how did he participate in the test? And you can see the below average, low end of average, average. And so this is where you can bring out that information to insurance or bringing the information to families of instead of just quoting a scaled score that nobody really knows what that means. How do you explain that and why is it relevant?

So another test that we're gonna look at, is the Pediatric Evaluation of Disability Index or PEDI as some people call it PEDI, PEDI, that type of thing. And so what we're gonna look at here is this is for our lower functioning individuals. So these are the individuals that we are looking at their functional capacity, okay. So we're gonna measure the capability and performance of functional activity. So their daily activities, mobility, social, and cognitive and responsibility dimension. So here we're looking at is how do they functionally participate in their environment? Okay, it's age one to 21. And what's great about this test is up until seven years old. You can norm reference it, you can

standardize to an age. And then after that, you can use it as a criterion reference and use a scaled score. And I'll let Mariah speak in terms of OT side, but from the PT side, generally we complete the mobility part. And what's great about the mobility. It's gonna say whether they're able or unable to do an activity. So sitting independently, the biggest thing is going up and downstairs, carrying fragile or spillable objects. So now we're looking at is how do they participate in their environment? So can this individual come home and the parent hand them something to carry to their bedroom? Can they walk enough to do that? Can they go up and down the stairs again, if they're able or unable to do the activity. And so again, you want to draw a relation to this and we'll show you a documentation example, but I'll let Mariah speak in regards to the other categories.

- So in terms of looking at daily activities and social and cognitive, we've already talked about how, especially with motor coordination and praxis, there's always a social component as well. When we coordinate our bodies, we are also looking at how we interact with the environment. And that's exactly what the PEDI looks like. Another test that we didn't put on here, but that I also really like that as similar to the PEDI, that takes a little bit closer into self care is the REAL, that's the Role of Evaluation Activities of Daily Living. So something like that. And I love that test in addition to the PEDI, because it looks at a very task oriented assessment. And I really like how these questions, they're laid out so that you can really piece apart. Okay, not only is it these activities, but what are some of the similarities between these activities? And then you get to see them in real life.

- So as we look here, another part of the PEDI is that it asks for the caregiver assistance, so they can report to, are they giving childlike modifications to extensive modifications? So again, how much is the child, the patient receiving modifications at home? How much does the caregiver have to provide for them? So when we look at this example here, I did block out some information about this patient, but really what you want to see here is this patient is 17 years old. Okay, so we're gonna look at a

scaled score for them. And we're saying, how are they participant here? Why is mobility challenge for this individual? Okay, and so we're seeing here, when you turn it into a scaled score, zero to 100 increasing difficulty. Okay, the functional capacity of a seven year old. So can the child walk and do their basic activities? Okay, so what we see here is this individual had a significant change in status. And so because of that, they are significantly functioning below age anticipated mobility. They require a maximum two dependent physical assistance for shower, tub, and transfers. They have a significant fall risk. So they're unable to walk over the outdoor locomotion. So they can't go over uneven terrains or inclines. Okay, but now we can see, see that I wrote that they're progressing to climb stairs effectively with close supervision and use of handrails, but they can't carry objects in their hands to go between the rooms. So when you're reporting on the PEDI, don't just report, they're able or unable 'cause insurance goes, well, maybe they're not ever going to be able. Show why there's been a change. And what is the capacity that we're looking for? How far do we want to improve their mobility? How far do we want to improve their functional participation in their environment?

Okay, so again, the BOT is the high end of the ASD population. And then the PEDI may be turned to your lower functioning, but either way, we are going to come in and work with their motor learning. Maybe they need practice, maybe their brain and their body isn't quite ready and let's help them by providing interventions to get them to that place where they can take an instruction or they can take in practice of a skill. Some other tests we'll just kind of briefly run through. So we have the Children's Assessment of Participation and Enjoyment, CAPE or PAC. What's great about this test is that it doesn't matter how cognitive function you are. You have the ability to participate. So when we look at here, it's gonna look at the diversity intensity of how they participate in activities and how much do they enjoy it? So a child can use visual images. So it will show one image of like a child being sad and one image of a child being happy, doing whatever the activity is. If that's the way that the child can report how they feel, but then it can also do visual ratings. So for your higher level kiddos, they can rate it. And

so what you're seeing here is the child's reporting. How are they participating in life, their quality of life, their social relationships and their satisfactions to do activities. So what's great is you can see and even ask how do they perform the activities? Do they perform with their mom? They perform it with their dad? And so what you're seeing here is that you're able, again, to take that child with autism and help them participate in their environment, more than just, I can get from point A to point B. I can stand there while my mom helps me get dressed. There's more to these children and there's more to help them. And a lot of it comes from that motor planning. What we talked about the body's ability to interpret the information that's given to them. So this is a great test for that. Another one is a Test of Gross Motor Development. This one's great. It kind of plays more into the school environment versus outpatient, but that may be where your setting is. This one's great as well. That three to 10, now again a lot of times, this is the age range where parents are now trying to decide and understand where their child fits in with peers.

Okay, this is a very hard developmental age. Because now we're into school and maybe it was just from the learning, but now we're doing PE or now we're at school and mom can't help me do these things. So how do I participate in these environments? So again, this test is a great one, 'cause it's norm and criterion referenced. So again, you can just base it on yourself or base it to your peers, and we're gonna look at play. So this is a great participation level activity test. So we're gonna look at play or physical education classes, which is generally sports development. Okay, again, there's visuals from a manual to help them again, to take that component out of the motor learning. So it's not just verbal, but again, we're gonna look at the quality of movement and activity skills. So this is again a great test, they've identified children who are significantly behind their peers in gross motor development. So you're looking at again, how do we participate? Because it's more than just, can I stand up, can I sit down? And so a lot of times families, aren't sure if their child can do these things. And so they hold them back 'cause they're nervous, but we want to come in and show as PTs that we do not need to stop when they are able

to walk, we can come in and help them participate. What is their level of participation? And so this is another great test for that. So I'm gonna let Mariah speak on these tests.

- Okay, so we have the Miller and we call it the M-FUN a lot. I think a lot of clinics call it the M-FUn. And I like this test because it feels very organic in nature. Like the BOT, it contains a lot of manipulatives, but it contains a workbook that is fun, is colorful for children. And it just feels very much school-based and participation based. I mean, it has the word participation in the name. So I guess we hope that's what it does. And it's for OTs and PTs, I'll say in our clinic, the OTs probably use it a little bit more than the PTs do, but it's a longer assessment and it's certainly comprehensive. So it's got some pros and cons to it, very comprehensive but long. So you really have to pick and choose when you're gonna use it. There is a short form of it, which is very, very nice. And I like that it really incorporates some of that visual motor in there, whereas the BOT incorporates more fine motor and gross motor. And this brings in the other part of our system that we certainly need to relate to. And the Movement Assessment Battery for children. I am going to turn this one over to Lisa because she uses this one just a little bit more than I do.

- So in the Movement ABC, this one's a great one again, to kind of spanned a different age range. So again, we're gonna look at three to 16 and this test comes across in three age bands. So it's gonna give you a kind of a grouping for each age group and kind of anticipation within that. There is both physical and fine motor type activities. So you're gonna look at your dexterity. It's gonna be with throwing and catching a ball, balancing. You're gonna look at some jumping. So again, there's, non-motor factors affecting movement that are considered again, this is now taking a step back, just not as blatant as like, can you stand on one foot? It's how many seconds can you stand on it? Or how many blocks can you balance? So we're gonna look at it from another perspective. Okay, the test includes simple tasks that are taken out of game or play context. Again, some of our children with ASD have a hard time understanding just a standardized testing protocol that we have to provide that. So how can we take it out

of game play or out of just physical play? So the child now doesn't just avert from our activity, but now they're participating for a different reason. Okay, it's norm reference again, it's easier to administer with children with short attention span than other traditional ones. So this one's a great one to just kind of come in and get in what you need to, there's also some other checklists that can be done by teachers and different things like that. It's a comprehensive packet of information.

- Okay, so you all might have heard of the SIPT. It's been around for a while because it was developed by Ayre's and it is also normed reference. It's also a very long test and it comes up with a kit, but it incorporates more of that sensory and praxis components of our motor coordination. Children with autism spectrum disorder demonstrate both spatial positioning and temporal movement. So spatial's our incorrect body positioning, body part for tool type errors will be elicited in this type of test and temporal, which is the poor movement and timing. They also have increased time to initiate movements. That is part of our temporal reasoning. And they'll have a lot more of these type of errors during this test. And I like it because yes, there is timing. There is fluidity, there is sequencing and some of these other tests, but specifically the SIPT really brings that out. It's comprehensive, it evaluates praxis and sensory integration for children between four and almost up to nine years old. So eight years, 11 months, it takes a look at various spacial temporal errors, including rhythmicity, mirroring and overflow.

We've talked about all those things in the previous hours. While impairments and basic gross and fine motor skills are found in children with other developmental disorders, including kids with ADHD and DCD, impairments with praxis seem to be specific with autism. A lot of this research is just starting to come out. So if you're really looking for a good praxis and sensory test to pull out some of this part of motor coordination. If you think that it's more than just motor coordination, this might be the test for you. Other tests to look at that, I'll be honest. I do not administer, but they, I found them in our research and the first four. Yes, first four were developed by Theresa May Benson. I

reached out to her and she said that people can reach out to her on this email link or website link that I posted. And she can give you copies of this test. She's still developing them. And she's put out some really great research on them. The test of Ideational Praxis. It incorporates that string test. So the little boy that we saw in the previous segment, him floating around the string. This one takes a look at affordances. What ideas does an object give you? And what are the ideas that you can generate from it? And do you utilize them? So the MSEL that was, most of the items are fine and gross motor sub-scales. And it also takes a look at the ability to roll, sit unsupported. Again, that postural part of our sensory system, and also use a mature pincer grasp. I think some of these are found in some of our other tests, but it's here for you. If you feel like, that you need it. Okay, so we are going to jump straight into some observations. Okay, our very first video is gonna be taking a look at some reflex testing, this little girl and our sweet therapist, we were doing just some of our basic reflexive movements.

And so it's not necessarily straight on reflex testing with her touching her nose, but I want you to watch when she has to go into positions of stability, what happened? She had to sit all the way back on her heel. She had to really turn and stabilize in her head and her pelvis. And so this one's more STNR, she's coming up and she gives us a beautiful, beautiful STNR. She sits back on her heels when she looks up. Good, and now Miss Nicole is having her turn to her right and her left. Oh, look at those elbows bending as she looks down. Okay, let's watch about half of that again, cause I really want to pinpoint that STNR. Good. So watch how her elbow bends and that pelvis shifts backwards. And she really has a hard time finding that postural control. So she looks up, oh, and our pelvis really has to go back. 'Cause she wants to look all the way up. And then when she goes to turn her head, her elbows bend, that's our ATNR coming out. When you go to test that ATNR, the very obvious one is those elbows are gonna bend, but any instability in the trunk is a positive ATNR. And when she looks down her elbows had to bend and her hips wanted to extend. Okay, so now we're gonna take that and we're gonna go into a little bit of goal development. So what's

your goal? What are your patients' goals? Lisa has really honed in on some of this. What is your discharge idea? What is your overall anticipation? But most importantly, what are the parents' goals? I had a conversation with a therapist today and she said, you know, the dad is really concerned about handwriting. Honestly, we're just not there. We have a really hard time even attending to me. And so we talked about different approaches, but also making sure that we're incorporating what's the parent's goal. You know, even if it's spending five minutes on handwriting, while we work on the other components that we see that will support handwriting. Of course, parent education is going to be very important in that, but the parent knows the child best and that's what's going to impact them functionally most, is to be working on whatever the parent sees. We have to take into consideration some of that burden of care. So the activity, the impairment, the participation, what is the activity?

Okay, so this example that I just gave, the activity is handwriting, what's the impairment? We can't attend to a task. We don't know where our body is. Our body schema is all over the place. We don't really know where our body is. Therefore, how can we do something that requires such neural input? That requires a lot of motor coordination, that requires a lot of cognition. That requires a lot of auditory and expressive integration. And then how do we participate, when we link all those things together? Therefore, what is our functional capacity? What is the family involvement? Is the family just there to be educated and say, do this? Or is the family actually involved in the session? I think it depends on the child, but you know, write a goal for it. So if you're out one day, the therapist knows, hey, I really want the parent involved here. And that, of course, what does discharge mean to you? What is the prognosis of this child? For example, somebody with praxis, we're never going to resolve praxis, praxis is lifelong. So what does that mean? Are we compensating? Are we supporting them visually? Are we supporting them in understanding their body a little bit more? And what does functionality look like for them? I'm gonna let Lisa tag on a little bit more to this from the PT perspective.

- So, again, that main idea of what is the parent asking us to do? What is the patient asking us to do, one big key thing within PTs? We'll talk about, is I may get the child to do all these different skills for me in the clinic. Same thing with OT, but then they go home. And when they're at home, are they still motivated to do those things? Is the family still feeling like they're unable to keep up with them when they go out and do public activities or that they feel like they can't go out because they just get too confused in the grocery store and they can't stay with mom or dad. And so what we really want to look at is, again, what is our discharge goal and in comparison to those parent and patient goals. So one thing that I often, often do with my families is, I ask them, you know, what is it that is important to you? And so through that, I'm able to show them and I'm always explaining, "Hey, this may be my goal", but this is a checkpoint because my hope is that they will do this with you.

So again, explaining why does my goal say such and such, because that may not be relevant to the family, but let me explain to the family why I am creating what I am creating and why we are doing what we are doing. My goal may say, this kid can do all these things and maybe the parents are looking for, like, I just want them to go on hikes with me. And so maybe it's not important for them to do jumping jacks or anything like that. That's not what the family is asking. But again, if the patient isn't motivated to do jumping jacks, maybe that's okay, because now we're looking for them to do this. This is what is important to them. Again, back to the CAPE testing that we just talked about, where do they find enjoyment and who do they find enjoyment with? That is our goal, is to provide that to these families. So now we're gonna give you some examples of some goals. We're not gonna read all these verbatim. These are just examples. This is just similar to the type of goals that Mariah and I write within our electronic documentation system. But in general, what I want you to kind of see here. As we talk about just some longterm goals within PT, again, insurance. What is insurance looking for? We always gotta keep that in mind. And one goal that I usually put in for my kids that have a hard time with standardized testing, 'cause I may not be able to do one. I may only have access to so many tests and maybe those tests are not

appropriate for that kid for whatever reason. So I'm gonna put in a goal that says, I'm going to help them be able to participate in a standardized test. Why is that important? 'Cause insurance wants data. And if they see that that's my goal is to get them to even participate in a test, that might give me some opportunity to work with the child. Again, strength, overall strength. Why am I looking for strength? This is also affected by motor planning. If you have a hard time understanding movement, you can't practice it and you can't build a base to do it. So I'm gonna put in, they're gonna have that overall strength, that motor memory, motor planning, to be able to have a strength component. So most of the time it's in regards to posture, okay. We're also gonna say again, why is this relevant? What is the recreational standpoint? What is their participation standpoint? And we're gonna say, they're gonna participate in an age anticipated recreational activity. Okay, because that indicates overall improved coordination, motor planning, safety, awareness, strength, and endurance, all those things together.

Okay, another longterm example is again, the overall mobility. Can they participate at home without loss of balance or increased dependence on caregiver? Okay, so again, those key words of why are we doing what we're doing? All these short term goals are great, but what's my overall goal? What's my overall discharge planning? So here's some different examples of goals. These are some, I've got it kind of listed out. So you can see this is endurance participation base. Again, we want to advance life physical function. Maybe that means modified sports play or sports activity or physical activity or functional actions. So again, maybe their goal is to play in a soccer game with their friends. Maybe it is to participate in PE because they're having a hard time keeping up with other peers, even in a self contained classroom, they just are having a hard time. So we want to look at that endurance participation base. Oftentimes as we talked about, that children with ASD have a hard time understanding why they're doing what they're doing, because they're trying to understand why you're asking them to do that thing. But if you put it into a participation and play, in a recreational activity, a lot of times you can get them to come in and participate with you. So again, maybe we're

just gonna participate in consistent physical exercise for 40 minutes because I want them just to play with me and move with me. And the last goal, the carrying personal items. This is one that a parent helps me create because they were saying, when they're at home, their kiddos in their teens and the parent needed help carrying things in from the car. And the kid just had a very hard time carrying a bag, but here in the clinic, they could carry an eight pound, 10 pound ball. And they'd walk all the way around the clinic with me. But when they got home, they couldn't relate that to a bag of groceries. So we actually started carrying a bag of groceries relative to the same weight here in the clinic. Again, why is it important? I may have shown that they could carry 10 pounds. They've got great arm strength, but when they're home, they can't relate that.

So again, that motor learning, how do we relate that back? So now we're gonna talk just some different activities. So, you know, here's just two simple ideas, modified hopscotch. I'm not caring necessarily that the one foot, two foot, I'm just looking for feet together, feet apart, but why is this important? Does the kid really want to do hopscotch? Does the parents really care if the kid does hopscotch or not? Is that a life skill? Maybe it could be considered a life skill that they're on the playground with their friends. So that is important that they can participate and do that. They can skip, they can run. But really what we're looking for is I've done hopscotch. 'Cause I'm looking for lower extremity dissociation. I'm looking for them to follow a visual pattern without me verbally telling them what to do. So again, without any verbal cues, I want them to be able to just move their body in a different way. I want them to coordinate in a different way. And so that's why sometimes you're gonna look at activities and you're going to adapt them for what you're doing. So again, you're gonna modify, but maybe that's how you modify is you're doing feet together, feet apart. Same thing with bouncing a ball. What am I really looking for here? Am I really looking for them to bounce a tennis ball to a peer and catch 10 out of 10 times, that's a great activity, but really what I'm looking for. Do they attend to the peer? Do they know that there's a friend with them? Are they able to interact and say, if I do something now my friend

can participate back with me. So now I have reciprocal planning, and now I can play with a friend. So maybe I get them to bounce a ball 10 times with me, but maybe now I'm gonna watch them play with a friend and they're just throwing a ball. Maybe the ball is bouncing. Maybe the ball is hitting in the wall, but they're reacting to each other. So that's what we want to look at. So here's some other participation based, again, that modified sports inclusion. Can they immediately imitate and do a gross motor activity? So again, anything whole body, you will see that I'm a big proponent of whole body. So can they just kind of do it as soon as I say, jump rope, do they know what jump rope means? Do they say, oh, if I'm jumping rope, I need a rope. I need to grab it and I need to swing it and dump it. So again, all those things together. So again, that's where we're looking at the activity, that participation and again, the different levels. So here's just some more examples. So now we're looking at functional participation. So these are for the kiddos that maybe jump rope might be too hard for them. So how can we get them to still participate? How can we still get them to interact in a level with their peers? So here, this is where you're saying, like they can climb a playground and if they're out at a park, the parent can sit back and watch them climb a playground. You know, can they sit with a peer and toss a ball back and forth with intention? Can they follow a simple, gross motor obstacle course, again, just in play. How can we help them play and explore their environment? And stairs, stairs is always a great functional participation because that's often where I hear the most that my parents need support, is that the child is reverting to crawl up the stairs and they're older and we need to help them because the parent can't lift them up anymore. So that's where again, you want to think about your functional participation as well as your individual tasks. So now I'm gonna pass it to Mariah for some OT.

- Okay, so I threw in some longterm goal examples. If you'll read the first goal, I'm usually pretty big on measuring one thing at a time. So I'm the therapist, if you go to my goal bank, I'll have five different goals trying to measure something similar. 'Cause I want to break it down 'cause with our praxis children, we have to break it down a little bit. What are we actually measuring? However, with this very first goal, it's a longterm

goal because within a year I want us to be able to put together a motor sequence and to the organization to be able to do something functional, like putting away mats after we do yoga. After we play with a game, they know how to clean it up and figure it out. And then I also quantified what standby assist is, standby assist for some people means just queuing, but coming from also an adult population, in inpatient rehab by some functional outcome measures, it's specifically how much queuing. And so I really wanted to say, no, I want you to do it relatively independently. But I think some kids, no not some, all kids require some queuing and direction of some degree. And so, then some of my longterm examples are very functional, hand-washing, but then I also throw in what we're looking for. So for a next therapist to see, hey, I don't necessarily want them to just adjust their clothes. I'm really taking a look at, do they understand their body by recognizing that their clothes are disheveled.

Okay, and then I really broke down on the next slide, different types of bilateral hand coordination. We talked a lot about how bilateral coordination is a much higher level skill. So, you know, some of these could even be longterm goals for some of your kids. I'm working actively pretty much on all of these examples with some of our children right now, and take a look and you can see how high level some bilateral coordination is. Even with a very simple task, somebody will take off their socks using bilateral hand skills with standby assist queuing only. They have to monitor their posture. They have to pay attention. They have to use two hands. They have to know how to sit. You know, so there's a lot of skills involved with just using two hands and just putting on your socks. It's really a complex task, but yeah, they're not only goals, but they're also treatment ideas. Okay, and then we break it down into play. And this is where we also bring in some of those praxis words. So they'll be able to problem solve, they'll show different affordances with new activities. They'll be able to have some more functional endurance. They'll be able to persist with something instead of giving up after only two or three times, which is very typical of children with praxis issues. And then on the next slide, we pull it together, utilizing social and coordination. So sometimes guys, motor coordination starts with just knowing that somebody else is there in the room and

sometimes it starts with just starting to play with somebody else. That's really the basis of it. We're gonna see a little bit later what that very first goal is doing. Visually reference that therapist with eye contact and interactive play. Okay, and then you can take that social coordination and go on to games like Simon says, be able to imitate and really open their world to what that looks like. And then a little bit more, yes, it's participation based, but it's also very skill based too. And I threw in the reflexes in here. So there's an oddly misplaced slide that we talked about earlier, which is that reflex side. And we put it in there specifically so that you could have that in your mind when we talked about these goals here.

Okay, so sometimes I'll throw in goal specific for reflexes because maybe we really need to go to be that foundational. But I'm usually throwing in the function of it. Why is integrating the ATNR reflex so important? It's because we need that. I had dissociation to be able to catch a ball. And sometimes we're just on that level. And we've really got to integrate that ATNR a little bit more. You can read through the other ones, on the next slide, just shows some random ones that I didn't feel like fit into a different category, but it also talks about different interventions. You know, we threw in some sensory in there, their posture. I threw in a little bit more eye hand coordination, but it didn't really fit into the reflex category, could have gone into bilateral hand coordination, but it really requires a lot more than just catching a ball. We have our visual coordination, we have our reflexes, we have our body scheme. We have distractibility that can go all into just catching a ball. Okay, and then a modality that I threw in here, which is the interactive metronome. Okay, if you look at the last little bullet there, achieve a task average under 55 milliseconds away from the beat. If any of you have taken a interactive metronome course, they come with a scale, that per age, what is considered average, superior, severely deficient. And I got the 55 milliseconds based off this child's age and what is considered average for him to be able to speed up and slow down, have efficiency. And so yeah, this one isn't necessarily functional based, but it is a very good tool to measure what is their neural timing and sequencing like, to be able to carry over into other functional skills.

- So now we're gonna talk about our interventions. So we've talked about our testing protocols that we may do. We've talked about some of those goals, but how do we achieve those goals? So the primary goal of interventions for those patients with ASD is improving their outcomes and then also making sure that our outcomes are focused because it's also gonna affect the parents. So we're focusing on the child. We're also focusing on parents, which we've talked about numerous times in this presentation. So we always want to consider the parent education, engagement is always part of intervention as well. Parental stress and psychological wellbeing is very important for these patient populations because they are the ones living in this environment. They are the ones that when they're going to the store, they're finding some frustration. And so they're living it.

So it's very important that we engage the parents in our activities, you know, to bring them in, help them as parents understand why you're doing what you're doing. And again, to really acknowledge what they're participating in as well. Currently, early intervention services are available and that's great to get involved as young as possible. Sometimes you're being involved before the child has received a diagnosis or you're part of that process. You're part of that referral. So the child's, you know, getting a developmental pediatrician evaluation as well as starting OT and PT. You might be one of the first providers and there's also other providers that are out there. So we're gonna look, you want to understand that there's ABA, there's other intensive behavioral intervention programming, and there's also parent involvement and intervention. So there's other programs out there from family counseling to child life specialists that kind of help with that process that may be out of your scope. That may be out of what PTs are supposed to be addressing or OTs or addressing. And so that's where you want to look to other professionals in the area as well. Same with, you know, speech, if they're getting frustrated because they can't communicate, then let's get speech involved as well. Realize that your interventions are going to involve other funding programs and other areas as well. You also want to be aware that states have

the zero to three programming of which that is government funded and that can help get a child involved and they can have early interventionists and other child specialists to help the families. We always want to incorporate naturalistic and developmental principles that are really considered the most successful approaches. So if we can, can we see the child in their home or if we're seeing them in the clinic, let's make it be as natural and not so isolated and so clinical that we want to see those improved outcomes 'cause we're meeting them where they are. So the impact of intervention programming as well, there's considerable research. And you'll see, in some of the references that we attached within this presentation. There's considerable evidence that has shown that physical exercise can be an effective treatment in reducing stereotypical ASD behavior. So 88% of children with ASD develop a type of stereotypy. So that's that hand flapping, that rocking or the movement that's repetitive and it's shown that physical exercise can help reduce that. And so that's also why PT can be very important for this child population. It's kind of notorious that PT is not as involved.

A lot of times providers kind of assume that it's just really OT, but it's not just OT. It's not just PT and it's not just speech. It's not just ABA, together we all come to support these children in our intervention. So exercise with moderate to vigorous intensity level, has been demonstrated to be more effective than low level intensity to decrease these occurrences of that behavior. So, you know, as we go into some of our activities, you'll see, we want to be intense. We want to be involved because this may help the child integrate in some of those activities that they're doing. Are they doing these activities because they're anxious, because it's a sensory seeking. So let's help their body feel that input through other ways. And physical exercise has been shown as an effective treatment to reduce that. So also we want to consider, as we're looking at our interventions, that individuals with ASD may rely differentially on proprioceptive input, relative to visual information. So that was all about our second presentation terms of praxis. So if we just visually show them, did they understand what you are doing, is what they are doing? Have they related that? So what we really want to consider when we're doing your interventions. Again, we talked about with our testing as well, is how

can we help them relate that information back? You know, Mariah has spoken before about that mirroring, and I'll be honest. I used to have a patient that very much could not understand what I was doing. And I was getting frustrated and I called Mariah and put her on FaceTime and I showed her what I was doing with the kid. And she said, try this. And so instead of me saying, no, or you're not doing the. Do this, and I just kept showing her, instead I said, I see you are doing this. I want you to do this, or I'm showing you. So I related it back to them. I see you put your feet together. I want our feet apart. Can you show me your feet apart? And so through that, I'm relating it back to her because now she goes, oh, I didn't realize my feet were together. And so she seeing that and so that's what we're trying to help them understand.

So again, instead of me pushing interventions or pushing activities on the kid, how can I relate that back? So we want to emphasize that link between the visual input and the activity. Again, that praxis. So think about that as we go into our interventions. My biggest key point, I'll tell you that this is where I kind of get on my little soap box, is I love whole body coordination. To me I start every intervention, whether from an infant to an older child, with whole body movement. I always say, what do you want to do to get your body moving? What do you want to warm up your body? None of us go to the gym and immediately start doing dead lifts or pushups. We don't just start into a very intense activity. We're gonna be like, let me walk around the track for a few minutes. Let me get my heart rate up. Okay, let me get my body ready. So that's for anything, it could be for a PT. It could be for OT or for speech. Let's all come together and get the body moving. Let's get us to a point where now we're engaged. Our blood is flowing. Our heart rate is going up. Our brain is warming up. Okay, so get the body moving. So how do we get the body moving? So again, let's think of whole body. Climbing jungle gyms, climbing, playgrounds. Let's just say, okay, you've got five minutes. I'm setting the timer. I want to see you consistently move in the playground. Okay, don't stop. You know, the kid starts to just stand there and they're only looking at the slide and they don't know how to get up to the slide. And so you encourage them. I see that you want to slide? Let's go up the ladder to the slide. Okay, now I see that there's a rock wall.

Would you like to climb the rock wall and helping them see different ways to move? So get the body moving, your older kids. I simply tell my older kids climb up and down the playground 10 times. Let me know when you're done and why am I asking them to do that? I'm asking them to tell me the number. So they're recognizing how their body's moving. So I say, every time you come down, I want you to give me a high five. Okay, 'cause now they're recognizing I have done a physical task. I have come back, I recognize me. They're coming in, associating me with their play. Okay, so now later when I ask them to do something, they have associated me with that play. Okay, even if it's something as simple as crawl through that tunnel and I'm encouraging them, crawl through the tunnel, come here, give me a high five. And I'm engaging them in activity.

Animal walks is a great thing. So animal walks again, walk like a bear, you know, walk like a crab. There's a great game called walk like a chicken that our clinic has gotten all around. And it's a great game 'cause it just makes your body move in different ways. Bicycle, tricycle, your scooter board or your standing scooters. Again, getting the whole body moving, getting heart rate up. Reflex integration ideas, so Mariah talked about some reflexes. Let's go in and get you kind of warmed up. And again is your brain and your body ready to learn. So again, we're thinking of those motor learning theories. What is our basis? Are we at the point to take in such and such an activity, how have we built up. Sometimes you're spending the whole session, just teaching them how to climb. You're just teaching them how to crawl. You're doing those basic activities. You're getting their body warmed up through an intervention. Sometimes that's a whole session in and of itself. But when we think of this reflexes, if my child is unable to crawl, they were, you know, skipped the crawl phase, which we talked about in our early developmental stages. They skipped the crawling phase and now they only walk. And now I'm gonna ask them to stand on one foot. It's not really fair to come in and ask them to motor plan that when they haven't warmed up their body, they haven't warmed up that left and right orientation. They haven't broken out of their ATNR that's gonna show up as soon as they stand on one foot. If you recall back to the video of the

little boy who I asked him to stand on one foot and immediately went into ATNR. So what are some things that we can do to get the body ready? That could happen within the 60 minute session? So rolling, crawling and quadruped. So I want to see here this little girl, which we featured before, what we saw before is that when she climbed, she immediately fell into STNR enhanced collapse. Let's watch how she climbs now. So we see, she's trying to figure out a way to go. She's looking to me for affirmation. She's looking for me to tell her, is she doing the right thing? We see now that she has isolated left and right. And gotten into it. Do you see her smile? She was so proud of herself for getting in and she's figuring out how to move. It's still hard for her to figure out how to get out. But if we notice the whole body is moving left and right, she's got to extension, she's got flexion. So we're seeing how she's going and you can see, she was very thrilled by that. So again, you want to see, this might be her warmup. This took several years for us to learn how to do and now she can climb up. I'm sure you've seen her. She's featured prominently within our presentations, but you can see how confident she's become. And so we're seeing how are those reflexes integrating? How did we warm up the body? Because now maybe later in the session, I'm gonna ask her to stand on one foot, but she just started to stand on one foot.

- Can I interject something super, super fast? So remember when we talked about children with autism spectrum disorder and children with praxis, they also have very low self esteem. Lisa just harped on an amazing point, which was, she was proud of herself. She smiled, y'all I can't tell you how often enough I have started with something too hard in a session. And it shuts us down the rest of the session because the child goes into a session feeling like a failure. We want to elicit joy, pride, confidence in the very first thing that we do. So start easy. Okay, Lisa did prep activities to help her go into this activity confidently. And then she did it even more competently. And she said, yes, I could do it because then those neural synopses start to develop and they start to generate even more. So you guys pick activities that generate joy and excitement and confidence, and you will see your kid soar.

- So another reflex, this is the same girl, she's obviously grown up. So we can see here, I'm asking her to roll. So this was just an isolated activity that we did. So we have the sound muted, 'cause there was other children in the background, but you can see she's looking to me and I'm trying to ask her. I said, where's your belly? 'Cause I'm asking her to roll to her belly. And so she's obviously recognized where her belly is, that body schema that Mariah spoke about. And now she's trying to figure it out. You can see that there's all sorts of reflexes coming out within this, but again, I'm helping her get her body ready. And then after this I did a little obstacle course for her. And so again, building up was her body ready for it? Does that mean that you stop? If a child only shows reflexes, I mean you never do an obstacle course. You never play activities with them. No, it just means you might start your session by helping them warm up their body.

So what is the way that I can get this individual to just be ready for intervention, be ready to put their body in motion. So sometimes you may spend, you know, a certain phase of your treatment care, several months maybe working on reflex integration, and maybe that's where your focused for that period of time. But you are gonna move forward. You are gonna go pass this. So again, you want to think, is this kind of my phase development and my plan of care, or am I doing this just to get their body started to go? So again, start out with an activity that warms up your body and gets you ready. So as we look at this, some other activities, so we've talked about some whole body coordination, but now we want to say, how do we do motor learning? And specifically, how does motor learning work for the PT or PTA? Like how do we implement that? Isn't that more of an OT thing. They seem to work with that, that learning capacity. But I hope that you've seen through this presentation that motor learning for the child with ASD is all encompassing and that each discipline needs to work on that. And so when we look at motor learning, what are ways that we can reach this child to help them beyond just that functional mobility, let's help them move past that, let's help them interact with their environment. We all know that is a coming of age thing, that everyone loves to play video games now, and everyone's relating to

iPads and devices and things like that. So let's use that. And it's honestly a very great tool to use now with the implementation of telehealth. And so we look at dynamic video game play, and what are we looking at when we do this? So this now we're relating a visual and abstract idea to the patient. Maybe they have learned that I am another individual. So they copy me and they copy maybe their sibling. But now when I show them a yoga picture that shows, you know, an animal doing an exercise, they can't understand that that animal is them. You know, if I show them, there's a great game that I love balance, called sturdy birdie. And obviously it's a bird with wings and I'll ask my kid, what are your wings? And the kids baffled, the wings are supposed to be their arms. So how can they relate to an abstract image or an image that is not a physical person or not them. And so sometimes these video game plays can relate that visual to self.

Okay, and we're gonna learn to move the body in response. So those of you who still have the Wii, I often use the Wii and the Wii Fit. I just used it an intervention today 'cause it's great. When you move the activity or the game moves. So how can we move our body in response? We're gonna look for the abstract motor planning again, when we've talked about praxis, you know, we have to kind of figure out our order and what am I doing to influence what is happening? You know, I want to kick the ball, but I don't realize that I have to get the ball first. 'Cause I want to play soccer, but I don't understand I have to find the soccer ball first. So let's help them figure out that order of operations. So if I do this, then this is what the game does. So a lot of times too, this is just self motivating for a child with ASD. They want to play and a computer game or they want to do a dance. So a lot of times I've used just simple kids' dance activities through my computer. And whether I do that in telehealth or in the clinic, it's again to get them to copy because I want them to recognize where their body is. Another thing that we do often, probably all of us do, is obstacle courses. And so when we take out and tease at obstacle courses, this is something I teach my students, but I want us to take a moment and think about, is when we do this, let's focus on an area development. So my child comes in, what is it that I want to focus on in progress? And

so we want to focus on balance today. So I'm gonna give them something to move. So I'm gonna have them jump on the trampoline to move first. Now I'm gonna have them go on stepping stones because okay, now their ankle is awake and they're realizing what's happening. Then I'm gonna have them step their foot to the top of a cone. Okay, and they're gonna go left and right to tap it or they're gonna hold it and stand there. And then the next thing they're gonna do is a balance beam. Okay, and then I'm gonna give them a sensory input. They swing or they go down the slide. Okay, the vestibular input now. Okay, so that's one round. And so that's one way to focus on your development. What is my goal for today, for this session? I want to work on balance today. They're showing me that they're attentive and they're willing to do that today.

So let me build my obstacle course that it progresses that. Do I want to work on power recruitment? I want them to run faster, by the end of the session, I want them to run faster. So now maybe my obstacle course is consecutive jumping. Now my obstacle course is a bear walk to really power out the legs and the arms and core to get ready to kind of get down and squat. And now I'm gonna ask them to climb the slide to go up again. That whole body has now been involved. So now at the end of the session, their whole body is awake and they feel powerful to run faster. Okay, gross motor gameplay. This is something I love to do for that spontaneous development. I'm gonna quickly show you the next slide. So you can see here for candy land. What I did is I wrote out that each color was a certain exercise. Okay, this is for my kiddo, that I want them to spontaneously do something without prep. Okay, so this is the kid that we've been working on. Skipping, but they've been able to only do it. If I prepare them for 45 minutes and then they skip for five minutes and then we say, okay, this is your home exercise program. So these are the kids that I want them to recognize the word skip. Okay, and so now I'm asking them to play the game. I'm helping them play the game. You know, that's honestly not the point and so now every time they're on red, I want them to skip. And I want them to recognize that command and immediately turn their body onto that task. And so this is a great way to do that. You can do it with dice. You

can do it with UNO cards. What is the heart mean? What does the club mean? Things like that again, to get them to spontaneously do something. Yoga is not just for range of motion. Again, you want to think of that abstract motor planning. Can they understand what the image is showing me? Did I present it through a digital media? Are they following a video? Are they following a peer or are we doing it in a group? Again, yoga can be more than just range of motion, two to step gross motor recall. This is also something I love to do, is I'll tell my friends, I'll say, all right, I'm gonna tell you two things to do. I'm gonna say it twice. I want you to skip, one lap and then run two laps. Let me repeat it. I want you to skip one lap and then run two laps. And so then my kid goes, and I see, did they run first? Because that's the last thing they heard. Did they skip one lap and then run one lap because that's all he remembered was a number.

And so again, you want to think of that gross motor recall, why am I doing this? I'm doing this because if I ultimately want them to be in PE, that PE instructor is gonna repeat the activities, maybe once. And then that kid is anticipated to watch their peers to keep up. Maybe they're playing a game with their siblings and their siblings are running and they're making up activities. And they're like, all right, I'm gonna go run and get this. And now the kids standing there lost because they've forgotten what their sibling just told them to do. So again, trying to do some two to three step gross motor recall, move your body type games. These are always great. There's a bunch of different cars that you can look up or you can create. Simple things like roll like a log, walk like a crab, walk like a penguin, shoot a basket. 'Cause again, you're asking them to recognize basic gross motor recall of exercises. So when I say stand like a batter they may look at me and not understand that a batter is in baseball. Even though I have a card that maybe is showing them that and they go baseball, but they haven't moved their body to be in that position. So these are great activities to get them to again, recognize spontaneous gross motor movement. Sometimes it's also great for that functional base participation. 'Cause you just want them to do something different. So I tell my families, I don't care if I walk like a penguin, doesn't look like a penguin. I don't

care if this activity looks exactly perfect. I just want them to do something different. So if I gave them a card that said, walk like a crab, and then I gave him another card that said, kick like a donkey. both of those tasks should not be interpreted the same. I don't care if they spun in a circle to be the first one and then jumped up and down to be the second one. I want them to recognize that there was two different tasks that were asked. So again, meeting the child where they are. Sports decomposition, this just means breaking it down. So I might ask them to play or they might ask me to play basketball, but now we're just gonna bounce the ball first. So we're gonna work on catching the ball, after we drop it, then I'm going to say. All right, now we're going to squat and push to throw the ball to the target. I had a patient just recently. Every time we threw the ball, it was always vertical. It was never forward.

So we didn't quite understand every time I said, you have to throw it to the hoop. Throw it to the hoop, that command was not processing for him. So I turned to him and I said, throw the ball to the wall. And the ball has to bounce back. And that boy did that several times. He thought it was a blast. And then after that recognized he needed to push the ball forward and we shot some baskets. And so really what you're looking at is decomposing a task down, your final game might be all these things together, but let's look at each component again. What Mariah spoke about of having all those goals. Sometimes you need all those goals to show what your final position is, but you also want your parents to understand why did I just write a goal for him to throw a ball at a wall? How has that functional? What do they understand that to mean? Why did I write a goal for them, to do such and such an activity. It's because I'm decomposing the task. Okay, how to play with gross motor toys. This is something that I've definitely started doing. Where I give them a hula hoop and I say, tell me three different ways to play with this. Show me different ways to move. And so if we skip here, you'll see this little girl. I asked her to play with a hula hoop and give me different ideas to use the hula hoop in physical activity. So what you can see is as I'm just asking her to do different things. So I say, okay, that's great. And you can see she's looking to me for affirmation. And one of the things, when she just went and ran through it, she said, I

can spin it and run. And I said, well, give it a try because I want her to learn through trial and error. Did that work or did that not work? You can see that this little girl tends to pause. She tends to kind of get really nervous when she perceives that maybe she won't be successful or maybe that she doesn't understand. And so we've come a long, long way for how she interacts. So let me just start this over and what I want you to really appreciate for her as she's doing it is we have worked a long time to get to this point. But I've just given her something and just said, tell me how you move with it. So again, she's kind of figuring it out. She's like, well, hula hoops are supposed to do this? She's trying different things. Does each thing has to be perfect? No, but I want her to recognize that there's different things. So again, that's what Mariah talked about. The affordances, can she understand that there's different ways to play with it? And so in my PT session, I'm purposely asking her to do it in a physical activity. Sometimes I throw her confusion. And I give her a jump rope and the hula hoop and say, how do you play with these together? So again, you want to put things in an opportunity for them to learn.

So I'm just gonna quickly skip back to this slide. So again, the main thing to think about with motor learning is just thinking about why am I doing yoga? What is my intent in this activity? What I always say to people is pick your battle. What is my quote unquote battle right now? Well, my battle is I want this young girl to understand up and down. So when the activity is showing that the belly is down, I want her to understand that her belly is down and so whatever else she does, fair enough. But I just want to see that she understands top and bottom. Am I looking at her to do the whole thing? So again, picking your battle again, you've got different games you want to think about, am I asking them to do it spontaneously? What level of provision and help am I giving them? Am I asking you to put it all together without any help from me? If they're getting to that point, then maybe they are reaching that discharge criteria. We want them to be able to develop, to do these things at home. Okay, and again, when you're doing activities, you want to know how am I my building up to their point of success. What Mariah spoke about before, am I hitting too hard, too fast? And now they're

perceiving that they are not successful and they're shutting down. Is it appropriate for them to be challenged or do I need to back up a little bit and take it from a different perspective? So those are some different ideas about whole body and motor learning. What we're gonna see here is Mariah's gonna go into some more of the praxis intervention type activities.

- Very good, okay. So this is gonna be a little case study about a girl that is two years old. And she was recently diagnosed with autism and where we're starting is we're starting with basic cause and effect. I want her to generate some eye contact. So that goal that I talked about a little bit ago, about some eye contact, this goal applies to her but not only cause and effect, but also adaptive behavior. If I give her some what we call playful obstructions, if something doesn't go her way, if she's blocked in, does she have the motor coordination to negotiate her environment? Or does she have the adaptive behavior skills to give us some eye contact to say need some help here. So we're gonna see some examples of that, but you'll be able to see more importantly, how is motor coordination directly linked to our emotional system, access to our environment and being creative and how we developmentally play.

Okay, and then we're gonna go into, how do we get there? How do we progress on with this? Okay, so this video is showing mom, little girls on the swing. She loves the swing and what we've worked on is some adaptive behavior. She draws her foot back and I tell mom, oh, stop the swing. And she's like, ah. I don't know how I feel about that. And so she's giving us a little bit of an emotional response. She's not crying or anything, but she notices that something happened and mom says more little girl says, huh something happened when I put my foot on this rope, Mom's standing at the ready, drawing some attention to those feet, letting her know, hey, your feet are here. And my mom says all done. Now there was a video previous to this one that I didn't want to throw, you know, 10 different videos out here. But what was happening also before that she's showing at the very beginning of this one, is she's throwing her foot up is she's wanting her foot. She goes into some Dorsey flection and her mom says,

okay, yeah, I'm gonna push you. You put your foot at me. Great, I'm gonna push you, some cause and effect. A little bit of body scheme. You can tell, not only are we giving her some vestibular input, but I've given her some tactile input. I do not consider this proprioceptive input. Based on the definition that we talked about. This is tactile input because her muscles are not generating force. Something is happening to her body. There's a little bit proprioceptive in there with her giving mom a little bit of resistance, but it's mostly tactile.

Okay, so what did you notice there? We noticed a little bit of object affordances. Oh, there's a rope over here. I can use my right foot and use it on the rope. I can use my left foot. We're getting some of that vestibular input. It was hard to tell in the video, but in some previous moments, she was giving us a lot of eye contact. When she brought us her foot. If we did not push on her foot, she would look at us and that is something new for her. I have a goal for her, for the eye contact. And this is why, is when I coordinate my body and I'm giving you a response. Do you socially engage with me? She's also getting some anticipation. I stick my foot out and I'm waiting and I'm waiting, oh yay, now I get to swing. We're gonna see next.

There's a little bit of some more playful obstruction, but also a little bit of some back and forth play and some body coordination. And I like this intervention a lot. This is the first time that she's ever been in this egg chair. And I say, peekaboo, this is new. She goes, hmm, this thing spins. She's figuring out, oh, I can put my hands on the handles here. I guess they're handles, I don't know what they're called. And I can spin to the left. I can spin to the right. She's really noticing her environment. She's noticing her body. I adjust her feet there because she was dragging them and I didn't really want to drag them. So what I did with my mismatched socks there. Is I was seeing if I mirrored her what would happen? And I'm showing her, hey, this is a different way to use the toy. Oh, and look, and she pulls it down. She coordinates her own body to go up and down. There is a few moments previous to this video where before she was even spinning, if I lifted up the I dunno, lifted up the flap to the chair, she would pull it back

down. She wanted to be covered. And this was just the next step. So we did that reciprocal play over and over and over again. She coordinated her body. Okay, and then on the next video, she's gonna start going the other direction. She realizes, oh, not only can I go one way. I can also go the other way. Okay, so she's starting to go to the left. She realizes something different. And I mirror her again. I don't mirror her with my words. I mirror her with my actions. 'Cause right now words mean nothing to her. There was a little bit of eye contact. She was like, oh my gosh, look at this. And she's figuring out her body, she's trying to coordinate her body. There she goes, dragging her feet again. That's a very primitive thing for her to do because she walks on her knees a lot. So she's going back to that safety support.

So something that she's working on in physical therapy is actually to stand because she has some inhibited. We'll call them reflexes. I think there's a lot else going on there. But she has a hard time with putting weight on her feet and engaging them. So the fact that she's even willing to spin and utilizing her feet to make her do that is a step in the right direction for her. And she's coming up with this all on her own. And I'm choosing to mirror with her by rubbing my feet on the carpet, by engaging in the same sensations that she's gauging in. Okay, and then on the next video, we're gonna talk about those playful obstructions. How does she coordinate her body and utilize her adaptive behavior to be able to get out of it? I was pushing her in this bin and we were just having a great old time, utilizing some anticipation. And that time I would use language like ready, set, go. And she's just trying it out. Mom was thrilled that from three months ago, she would have just sat here and cried. But now we've given her some cause effect, some playful obstructions. She holds her arms up signaling help. But what does mom do? She doesn't completely rescue her. She shows her, oh, this is how you get out. And so then the little girl has to try to figure it out herself and she has to engage them as well. Playful obstructions is a big part while you're doing some cause and effect. You teach them, okay, how do I coordinate my body a little bit different? Okay, so why was that playful? We were just pushing the bin beforehand. Okay, we're giving her some tactile input with the bin. She is engaging some of that

vestibular system. She is realizing, oh, I want a different toy over there. Okay, it was a playful obstruction because once she wanted to be all done and engage with something different, like the ball, she could get out of it. But if she wanted to stay in, I probably would have said ready, set, go. And we would have kept on pushing. We were having a lot more fun. I didn't just plop her in the bin and say, here you go. Be miserable, get out. That's not playful, that's not fun. Okay, so what else did you notice? You probably picked up on it and we talked through it a little bit. We used a different part of our body. We were climbing over things. We tried to put a little bit of weight on, we got some of that hip dissociation. I already mentioned, we did not fuss. I realized that the sound is off, but for her that's a really, really, really big deal that she has come so far in her motor coordination that she realizes that she has some autonomy.

Okay, and then she gave us a little bit of eye contact and she raised up her arms essentially saying, I'm ready to get out of this, I need some help. Okay, so the session note for her, you can read through this on your own, but it's essentially what we've talked about. We talked about interpersonal skills, motor coordination. I'm not gonna spend any time on this slide, but I just want you to read through that on your own. Okay, so we're gonna talk about the interactive metronome at our particular clinic. We are, I think we're all certified at interactive metronome and there's many, many different layers to this. But what our sweet little boy here is doing, is he hears a beat and he has to try to clap on the beat. Okay, so those goals that you read earlier about interactive metronome and milliseconds away from the beat, it's a little hard to see, but the numbers that are yellow are somewhere in the one to two hundreds. And that is how many milliseconds he is away from the beat. Okay, so essentially he's clapping too soon before the beat, he's anticipating the beat to happen too quickly. There's a lot of things that I'm gonna say about this video, but what I'm looking for in this moment, we just started interactive metronome. And for the first time I'm not giving him any tactile or vestibular input. And I want to see, can he speed up and slow down on his own with the auditory input? Or do we still need the tactile input? One of the ways that we were getting that, is he would sit in my lap and I would bounce him on the beat. So he could

actually feel that rhythmicity and then he could try to coordinate himself. Okay, interactive metronome is great. If you have not heard of it, please look it up and please consider taking a course in it and possibly getting certified. It's very easy to get certified in it. There's a lot of research about interactive metronome. We use it all the time. This next slide is gonna talk a little bit more about what you can do with it. Okay, so treatment progression, where you start is you just want a child to recognize the beat. Okay, want to recognize that there's something to pace ourselves off to. So rhythmicity, neural timing and sequencing. We talked about this in the praxis course that even going back to infancy with breastfeeding, that suck, swallow, breathe, our rhythmic rocking. When we get up into quadruped, that is all that neural timing and sequencing.

Okay, it's something that should be relatively innate, I'm not necessarily talking about, can you clap on a beat when you hear a bunch of music? Yes, this is what interactive metronome is thriving off of, but the actual innate neurological sequencing and timing and rhythmicity is something that is usually within us. So for treatment progression, I wanted to see, can you just understand the beat or are you looking all around and just randomly clapping? Okay. for him when we first started, he had a bunch of reds. He just could not figure it out. So the fact that he was getting any greens at all was a big deal for him. Now, after this video, we did this again and I did go back and bounced him on my lap and he did much better. And then I'm slowly gonna phase that out. Okay, I phased that out by maybe patting on his back or occasionally when he gets too far off the beat, maybe I'll help him hand over hand, actually get back on the beat or another treatment strategy is me also clapping, but I'm not necessarily clapping on the beat. I'm actually there to throw him off. He might clap and then I might just clap after him. Depending if I'm trying to speed up or slow down and the kids will usually look at me like, what are you doing? And then they'll go back and they'll listen to the actual beat. These are things that are talked about in the interactive metronome course. And they're so many more, but that's just a quick little glimmer into where to start. Okay, guide sounds. You couldn't hear them because the sound is muted, but there's

something called guide sounds. So the beat sounds like a ding, ding, ding, and the guide sounds come in when you've gotten a red or a yellow. So a red might sound like a womp or a yellow might be like a brink. And then the green just makes some other pleasant sound that feels kind of good to your brain to be able to get it and you're getting that visual feedback of the green. For this little guy and for pretty much everybody, you want to start without the guide sounds because it can be too much. A lot of our children with praxis and coordination issues also have issues with auditory processing. And this also helps bring things together.

Like what Lisa was saying, is if I give you a command, like what you're gonna hear in school, can you adjust? Do you have the flexibility to quickly respond to it? And this is what interactive metronome can work on. But initially guide sounds can be too much. Once the child starts to recognize the beat, starts to speed up and slow down and understand, hey, I'm starting to get some greens here. I'm starting to get on the beat. You can start to incorporate guide sounds. They might take a little bit of a dip in their performance, or they might start to skyrocket because those guide sounds are there to be helpful. When you do guide sounds, it's really important that they wear headphones because if they are clapping too early, it's gonna come through the left ear. If they clap too late, it's gonna come through the right year. And so you're trying to get these different hemispheres to work. It's a lot of feedback, but these children are learning how to give it and how to be an asset. There's different ways to engage with the interactive metronome. Here this little guy is clapping, but you can also alternate hands. You can do this socially. You can play patty cake with different friends. You can hit different points along an infinity sign to get them to do some crossing midline. You can do both feet. You can do both feet involving just toes, heels. You can have them step up and make sure that they're tapping on the trigger when they step up. You can have them bounce a ball on a trigger. So things can get really simple, all the way up to really complex to wherever your mind takes you. I do a lot of rotational activities, so maybe they have to clap and look at the screen. They have to clap and look at the screen for a little bit of visual fixation. Maybe they're doing it while bouncing on a ball,

but really you can start out simply. You can also use it as a self regulation. Again, your heart has a rate and a rhythm and a sequence to it. So sometimes doing interactive metronome, just for rhythmicity and timing. Even if it is hand over hand, 100% of the time can help organize the kid. So if they're at a fairly, I don't want necessarily want to call it a lower level, but if they're just not ready for a more independent skill, do hand over hand with them the whole time. So they get exposed to this rhythm. There's been plenty of kids where I'm just playing a metronome throughout our whole session. Okay, this next video is gonna go back. We saw this in the previous segment, but I want to play it again because this time I want to take a different spin on it, on to that neural timing and sequencing. Her swing is going back and forth in a timing. She has to coordinate her arms and her body to grab onto the rope, that is neural timing and sequencing. And we can click onto the next one. There's a program that I have not personally taken, been formally trained in, but a lot of therapists have done it. And, I took a small little CEU course where they brought up this program called Bal-A-Vis-X.

Okay, and I believe, yes, in the next few slides, I wrote out what that treatment progression looks like. But here I was doing it with this little boy who was also doing the interactive metronome, and we are just passing the bean bag back and forth to each other. Okay, and we're going into square. You can also go in a oval, but this beanbag is nice and filled with sand and you get to feel the weight in it. You have to cross midline. And he has to visually track where that bean bag is. Okay, it started off with just one and now we've moved on to two. So he has to not only feel what his body is doing, but he also has to watch mine. So we are doing it at the same time. We are socially trying to be an interpersonal synchrony. We're just gonna watch what happens. He's actually telling me at the moment, he's like, this is too hard. I can't do this. But we started off with a really great prep, which is at first we were just passing the bean bag back and forth within our own hands. And then we went into a square and then I threw him for a loop. And now we're just passing it together. This is the very first time that we've tried it. You can see I'm giving him a lots and lots and lots of cues. And he's looking at me like, ah, what do I do. Typically, what you would do with something like

this is you would do it standing, or you would do it on a balanced board. That's where the ball in Bal-A-Vis-X comes from, is balance, Vis is vision. Okay, the A is for auditory because when you're smacking it in the hand, you're getting that auditory feedback. And that's what you want, because then you're hearing the rhythm. Okay, now the next slide, this is only a week later, you can see what he's doing. I gave him much less prep this time and he changed it up on me. He was like, no, I'm gonna do the oval. Typically I want to guide that 'cause some of our kids get really impulsive and they have a hard time staying on task and they need to keep things alerting and new. But that time I actually loved that he knew I can interact differently with this. For any other kid, oh and he just totally wanted to miss the pattern there. And I'm reminding him, hey, stick with the pattern. Typically before moving on in a different direction or a different pattern, you want to be able to do this for two minutes straight and I want his hands palms up. And if you notice he keeps on reaching, like he's about to catch a ball in thin air.

- So if I can pipe in just real quick, well, you can also see with a lot of these activities. I want you to take a step too, how is this, you know, relevant between things. So what is, you know, we practicing these things and again, kind of taking into what we've already spoken about as well, is that this little boy, when he runs, it's improving, but it is very mistimed. We're kind of not sure which foot goes first. We kind of trip a lot. And so by doing these activities, this might be a great prep or maybe something that he's doing in OT, and then he has PT afterwards. And so his body is ready for that. So, you know, even with interactive metronome and these timing things, think about why are we doing these things? So we're doing some gross motor movement. We're doing some fine motor movement and together we're going to accomplish different things. We're going to take this to the next step. And so that's where it's very important across disciplines to communicate what was done in one session for what would be done in the next, even if it's a day later that week, kind of. You know, what are we building upon? What are our building blocks? This little boy receives both PT and OT, and it's been great to be able to see the timing, things that he's done within OT has carried over into PT and his availability for activities within that as well.

- Thank you, Lisa. That's some really great input. And so this next video, I believe, yes, we start using two bean bags. Again, this is just a week later, see what happens, maybe. Oh, right, I'm so sorry, guys. This is the video that would not work for us. So essentially what happens is with two beanbags, he was essentially flawless. So I showed him, we did lots and lots of neuro timing, but this is where his zone approximal development is. We are meeting him at an appropriate foundation. He was able then to very, very easily coordinate two bean bags at the same time. There's a demo video that I have with me and another therapist a little bit later, that will show you what some of this looks like.

Okay, so this next slide, typically what you need for other equipment is you need some racquetballs. Specifically, racquetballs not tennis balls. I want racquetballs because they have a sound and a quality to them. You want a balance board and you want some sand filled bean bags. I've tried them with other beanbags and that's great, but I like the sand filled bean bags. And you can get this on the Bal-A-Vis-X website. They come in different colors. Things are very uniform, I like it a lot. Okay, typically, you want to do this for children five years and up, however, you can do this younger. You just need to understand that you're gonna use a bit more hand over hand assist, and you're gonna need to adjust why? Okay, so you saw the one bag rectangle and the one bag oval. Then you're gonna follow it up with two bags. Okay, your one bag rectangle and two bag rectangle with feet. I'm gonna show you what this looks like here in just a minute. And then the one ball bounce. The one ball V the two ball bounce. I'm gonna show you all of this. Okay, looks really complicated, I've had kids. Not much older than this little boy here. Be able to do all of these things. And what's fun is you can get multiple children to do this altogether. And then it ends up being a fun game. Okay, some kids that have a lot, a lot, a lot of trouble with neural timing and sequencing need to do these activities in short bursts, because it's hard. It's really hard for them. Or you gotta figure out a different way to make it fun. Like I said before, typically you want to do this in standing. If they need a little bit more physical support, like this little guy and

some queuing about where our hands go, you typically want your hands to go on your knees if you're sitting. Otherwise, if you're standing, you want to keep your hands out to the side. If your hand has to come to midline to place the beanbag, we're not actually crossing midline. I want to actually cross midline. Okay, so throwing in more supports, like a balanced board can make that a bit trickier. Okay, other things to consider that I mentioned before, some of these kids who need to constantly stay alert because of some of their sensory processing can do these sequences just fine, but they can't do it for two minutes straight. They can't regulate themselves. They can't modulate themselves to be able to stay coordinated for a period of time. These are actually the kids that I've noticed and Lisa, you might want to chime in if you feel differently, but I've noticed these are the kids that actually have poor endurance is because they need quick bursts to keep their alertness up. Instead they have a hard time coordinating and staying with the same neural timing and sequencing and rhythmicity. Do you have anything to add with that, Lisa?

- Yes, what I'll say with this is what I noticed within a lot of my kids at time of evaluation or early on. Is that the kiddo does very phasic bursts of activity. So they're very like quick to come in and quick to stop. Again, you can see this in the BOT, that one's a great one. 'Cause they do it great on the first trial, second trial they're like exhausted. And so again, that's another thing that you're bringing in when you do some of these tasks, it's that ability to endure in a coordinated activity from a physical standpoint, can I keep my arms up? Can I stand up for the activity as well as can I sustain a gross motor postural support and do a coordinated activity? So I'm sure you saw it with a little boy doing some of these things. He was very rounded in his posture because it's hard for him to sit upright while doing a coordinated activity. And so those are the things that we are coming together again to work at. So if I was doing PT and I did a lot of strengthening, then I would anticipate that in OT, the kiddo should have more endurance to do this activity because we have just built them and primed them for the task and vice versa. You know, if OT kind of spent more time on these activities, what can I anticipate in my session? And I can't emphasize enough of how these

exercises can be done between PT and OT, because we're taking them through different tracks. But our, you know, interventions may look similar, but where are we trying to go with this? And how do they build together for the child?

- Great, thank you so much. So we're gonna see this little boy again, and I just want you to keep him in the back of your head right now. We're gonna talk about the treatment progression. So keep the slide of the treatment progression in your mind. So at first, we're gonna do the one bag rectangle and the one bag oval. And when you do this yourself. You can feel your brain working. When several of our colleagues did like a one hour CEU course on the Bal-A-Vis-X, we would actually do these things prior to start working our day because it made us just awake and alert. So what I did there to our therapist Lauren, just a second ago is I moved my hand because she stopped watching my hands. And so I moved my hand for her. So she would quickly remember, hey, yeah, you're supposed to put this in my hand. I'm moving through this progression much, much faster than you typically would for a kid. Just because I want to show you quickly what you do. Okay, and then the next one is the two bag rectangle. And then I'm typically not giving her a cue. Sometimes I give her a verbal cue that we're gonna switch. Sometimes I just up and switch it because I want that flexibility.

Okay, then we'll move on. This one we add feet, sounds really complicated, but after you get it, it's like riding a bike. You really start getting it going. So this one, I think, I think we just jumped straight into two bag rectangle because you've seen what the one bag looks like. And then here we go with the oval, with the oval and the feet and Miss Lauren, you see me laughing. Just the idea of it. She was like, I'm gonna do what? She's able to catch on pretty quickly. But some of your kids might need lots and lots of practice. They can do this, it looks hard, but they believe it or not. They really can do this. Okay, so I'm gonna go through next the treatment progression of the ball. This is just the one ball bounce. What you generally want to do is you want to hold the ball like a C, you don't want to grab it. And when I'm dropping the ball, I just let it go out of my

hand. I'm not actually bouncing it really. Okay, so I did the one ball bounce and hen I did the V. And now I'm doing a two ball bounce and here comes the two ball puppet. This is the most organizing skill of all of this progression. It's hard, but it's organizing. Okay, and then you can go into the partner ball. She crosses it over and she bounces it to me. Good, and then we end up going into the two ball. This one's also a lot of fun. If your kid can catch a ball, they can do this. There's a little bit of a learning curve, but you really, really feel that timing, rhythmicity and that coordination. She did a great job. Okay, so I want to talk a little bit more through that. So you can certainly take the course on Bal-A-Vis-X. Like I said, I have not taken it. I've just learned from my peers and it has been amazing.

So I'm sure there's so much more to this. I've seen other videos where people also use it in the adult population where they're sitting down and you got to try it. It really fires up your brain. So it's a great prep activity. I'm gonna bring up that little boy again, and we're gonna do some more higher level praxis. This is also one of my favorite things to do in an obstacle course. And the idea was I asked him, initially, we have this big old playground. And I said, okay, I want you to climb from the rock wall all the way around the outside of the playground. You can see a little blue swing on there, get from the playground to that swing, then get on this green swing. Okay, and he was able to actually to figure it out. And then he gets on this green swing and I say, okay, I want you to get from that swing to the crash pad without touching the floor. So he really has to pull together all of his praxis, but then also that neural timing sequencing, bilateral coordination, very high level skill. If I gave this to him six months ago, we would have tanked, but he actually found this a lot of fun. Okay, so he's coordinating his body. And what I'm doing, is I am using a little bit mirroring with him, but not necessarily with my body this time. I just say, wow, you pulled back on the swing and the swing moved. Now, he likes to talk a lot. So I wanted to keep my words to him pretty powerful, which was, huh? You pulled back on the swing. Okay, I didn't want to necessarily draw out my sentence with him because I really wanted him to quickly understand what his body did. Okay, so now he chose, I'm gonna fling my feet over and I'm essentially telling him

what he's doing. He cheated a little bit, But he knew, I got to get this swing going somehow. He is really trying. Oh, and he pulled himself in and he did it guys. He did it, he did that about five more times after that, he was so proud, but he figured it out and taking everything that we've learned so far. We just did probably 10 things in that one activity. It was hard. We've done it before, he shut down with it. Because at the time that I had given it to him, it was just a bit too much. So we broke it down. The other things that we're working on is eye, hand, body coordination. Okay, this one, this next one is a little bit more reflex integration.

Okay, this one is some startle and some Moro reflex, because that is also some development of sensory stimuli and eye, hand and body coordination. So I have him holding onto the ball, tucking his legs, tucking his chin. He's trying to hold this body still. He counts for seven and he starfishes out, the very first time. Gosh, the very first 10 times I had him do this. We were doing teletherapy at home and he immediately flung out his little body into the ATNR when he did it. He, and you can see a little bit of it on that left arm. But also what happened is this time he brought out his arms and legs together. He could crunch it in. We're going in to some force. We're getting a little bit more proprioceptive input and then boom, he starfishes out. Okay, the very first time I had him do it, I'm pretty sure his mom had to help his arms come out, along with his legs. Why do we do activities like this? His goals that we're primarily focusing on, our parent directed shoe tying, catching a ball. Okay, not shoe tying right now. I'm not catching a ball. I'm trying to prepare his body and to get those neural synopsis firing, what do we need? We need eye, hand, body coordination. We need to integrate our startle reflex, which is what that ball activity was doing. If something's coming at me, how can I coordinate my body to not startle our way out of it? Okay, that one's very, very powerful for him. All right, so we saw the little girl doing the same exact thing, but this one's also a really great one for catching a ball because he is to look at that blue ball. Look how much more fluid he moves. Okay, I'm having him visually fixate the whole time. This is part of that activity, is not just rolling. They have to fixate and control the direction of their body. I saw another little girl. She could not do visual

fixation. This activity was way too hard, but we're getting some good proprioceptive vestibular and some tactile input. If kids get way too dizzy with this. They're not visually fixating. Okay, he controlled his body pretty darn well, the first time that he did this, I think he went into a giant C curve. So this is some catching the ball prep at our clinic. I think most of us are also certified in the integrated listening system. And this is part of the integrated listening system playbook. What I wanted him to do. We got a little bit of balance in there and I wanted sweet boy, but he knows he's got to get right back on, but I want him to hit right and left right and left. Good, and he's trying, he's trying to coordinate himself. And the very first time we did this, the ball was going everywhere. And the first time we did it was only a week prior to this video, we're meeting him right where he is. And he is taking off, he's switching right hand, left hand, a little bit of bilateral coordination. Also controlling his body and his posture.

Okay, all right. Now we're gonna go straight into catching a ball. I know I didn't let you know how he did previously, but he's still a little bit of a mess there. But about five months ago. He couldn't catch a large ball at all. And now we're on to a smaller ball and we're able to catch it somewhat. Now he still has a little bit of some overload with visual input, but for the most part. I mean, we've just caught it five, six, almost seven times there. And we're able to bring our bodies back. Okay, so what did we do? We essentially did all of this. We did the rolling. We did the Moro reflex integration. We did some balance work. We did a lot of things that went back into that primitive or moreso infant stage of development of where does our eye, hand coordination really come from? It comes from the rolling. It comes from the army crawling. It comes from the visual fixation. And then it comes from also integrating some of that startle stuff a little bit and understanding our body. Okay, here's another little girl where we're doing a little bit more praxis stuff. Moms big goal is attention. Okay, the thing with this little girl is it's hard for her to attend to a task when she doesn't understand what her body's doing, she can't really feel her body. She doesn't understand how her body interacts with the environment. Okay, and what I'm doing here for her is something similar to the previous activity. We were pretending to be butterflies and she's coming out of her

cocoon. She's about to get on her swing and she's gonna go fly. She's a very creative girl. So she's getting a lot of proprioceptive input all on her own, but I didn't tell her how to do it. The only thing that I was doing, is I said, your toes touched the swing and the swing moved. You stood up in the swing that you were in, is I gave her a little bit of the feedback that she was doing. I didn't tell her what I wanted her to do or what she should have done differently. All I was doing is I quickly told her, your toes did that. And it only took her about five minutes to figure this out. The previous week I did a different trial and we just couldn't really get there. I wasn't giving her verbal feedback or if I was, it was a bit more long winded, but I was quickly directing her and mirroring her and saying, your toes just touched the swing. You just stood up. How did that feel? This is the girl whose shoes are always on the wrong feet, whose clothes are frequently disheveled. And so, I go back to mom and I say, she did it. She figured it out. She was much more attentive. She was much more alert when I asked her and I said, hey, come on. We're gonna go put on your shoes.

That transition time was very minimal. She hopped up and she was alert and she figured it out. She was confident, she could follow directions much better. And she could quickly respond because I told her what her body was doing. Not necessarily what I was seeing, but I was telling her, your body just did this. Now I try to imitate kids when I can. And I mean, imitate exactly what they're doing, not necessarily what I want them to do, but just to give them more feedback of this is what your body is doing. And then I'll try to redirect them back. Okay, this girl is learning how to interact with her environment and where her body plays a role into that. So mom said, okay, what do I do with this at home? And I said, okay, mom, ask her this, honey, how do your clothes feel right now? Just draw her back into her body. And mom said, ever since she started asking those questions, she has taken off. She remembers where her things are in the house. She's now independently putting her shoes on the correct feet. She's quickly washing her hands and sequencing through it all because she's started to understand where her body is in her environment. So this sounds a little bit more OT, but this is also very important for our PTs. Sometimes you have to go back to this and

help a child understand where they are in their environment and what influence they have. Okay, so that's it essentially for interventions, we could certainly overwhelm you with so, so many more, but I think those are some really good, big takeaways. After all of these kids, we then took it to a functional standpoint. We practiced exactly functional, what the parents were wanting. So with the little boy, we jumped straight into shoe tying because that requires that neural timing, rhythm, synchrony, bilateral hand coordination, the visual stuff, and the really soaring. The more opportunities that they can feel their body and understand what impact their body has on the environment, the more they will take off. Okay, so documentation examples. I'm gonna let Lisa jump into here, 'cause she's gonna talk about PT first.

- Just real quick, just so you can have some examples again, this is through our specific EMR system that we have. Everybody's is a little bit different, but the main thing you really want to focus on for most intents and purposes is your assessment. You know, you can write everything in there, so somebody else can do it, but really why is it important? So for this example, you can see that I always like to put what they responded well to. So she did very well with verbal cues to progress the ball handling interaction by the end of the task. So I'm showing why it was important. What I did, she was able to visually follow the ball for more effective handling and include cognitive dual processing demands. So she was able to do two things at once. This is my, they can walk and talk. And why is this important? This is indicative of improving body awareness, timing and sequencing. So in your notes, you kind of want to focus on that. You want to talk again, why is this important? What is our ATP? And again, why is it relevant? Here's another example. This is the fellow that you saw his assessment. He is a very aggressive player. And so one of the things you can see here is we worked on a basketball activity, therapist and sibling emphasis on self regulation and body awareness to grade level physical aggression. So this is a kid that could not be included in team sports. He was actually taken out of some group activities because he became too aggressive. He has since progressed very much so to be able to participate with peers of below age or above age, but you can see here, he transitioned

in a higher sensory seeking behavior. And then what we did is we were able to still play a game without sensory preparation. So yes, this is PT, but he could not play a game prior before, unless I did like 45 minutes of whole body stuff to get him to calm down. But now we're seeing, he's able to follow the guidance of the therapist today to refine his movements in a novel gameplay. Again, I use the we, now he can recognize an abstract image and respond to cues and be okay with me coming in and helping him. So again, we're seeing that community involvement, that carry over possibility.

- So there's a lot more that I could have thrown in here, but for the purpose of this presentation, I really wanted to throw in some of the verbiage that we've already seen. So a little bit of reflex integration, I realized that we didn't talk about rhythmic movements, but I at least wanted you to see what that was because there are some reflex integration protocols that incorporate rhythmic movements. So I encourage you to look up the method. I encourage you to look up, move, play thrive, which incorporates the rhythmic movements and really do your research and figure out what's gonna be best for you. And the thing that I like about rhythmic movements is that they incorporate the brainstem and the cerebellum, which in the previous segment, we talked about why that's so important for some of this integration. Okay, so we've done tonic labyrinthine, we've done ATNR and then we take it to bilateral hand skills. You'll see a different way of how I document reflex integration. You'll see how I document the interactive metronome, maximal assistance to clap on the beat. That's okay, it just lets me know. This is where we are, hand over hand assistance provided for at least half the time. Sometimes I throw in the task average there, which the task average is after the whole session, how far away were they from the beat? So this particular child was 180 milliseconds. So 1.8 seconds away from the beat every single time. Okay, and then we transitioned that onto some shoe tying board. This is also how I document praxis. It's certainly just one example. Okay, let's jump into discussion of other interventions. We talked about imitation, utilize imitation with your body as much as you can. So the kid is getting more visual feedback of understanding. This is how my body just impacted the environment. Okay, usually when they are

imitated, if you remember from the previous segment. When they are imitated, whether it's right or wrong, they will start to then flow and doing the right thing. They start to understand, this is what my body feels like. This is what it does. You naturally get to guide them and then if they're still not getting it, then of course do some more hand over hand assistance. And then you can try to get them to imitate you. But what I mean here is you imitating them. Okay, if you do verbal, try to keep the sentences short. Now, Lisa had talked about a little girl where she said, I see you doing this and that's pretty isolated for that little girl. She can handle more verbal stuff, but for other kids, it's bam, your toes touched the swing. Bam, your foot stomped on the ground and you try to keep it quick so that we're not bombarding them with so much information. Okay, remember those mirror neurons, they're very, very powerful. And children with autism need to engage these mirror neurons, which are right behind the frontal lobe. They need to be fired and it's not just by them copying you, it's by you copying them and that interpersonal sequencing.

Okay, start successful. Keep that pyramid of learning in the back of your mind, start at the base, get them prepped with sensory techniques, with reflex integration techniques and bring that up to motor coordination. And then later add the cognitive sequencing components into it. If we immediately jump into that, what are we teaching them? If that's too hard, we're teaching them, ah, this is hard. I'm having a hard time doing hard things. This gets to be sometimes the one place where they can feel successful. This is the one place sometimes that maybe they can feel proud of themselves because the world can be hard, really incorporate social play. As much as you can, get on the floor, have fun with them. You got to get that interpersonal relations going on. And then with the shoe tying and dressing sequences, especially with children with autism and praxis, keep the same routine, break it down. When I teach shoe tying, I start with just crossing the laces and making sure that they cross the laces the same exact way every single time. Not just can they cross the laces, do they cross it the same way every single time, because it's going to affect their later steps. Okay, even if it's just one

week, focusing just on that and they get to be successful, one thing at a time. Do you have anything else to add to that, Lisa?

- Well, you can really see. It's just really, we're giving you a snippet of some testing and some interventions, and really there's so much more out there to learn, there's other programs and other development. And our anticipation is that you're able to take these things and maybe change up your routines and change up your interventions. And the way that you look for children with ASD of that motor planning is very important. That there truly is that impact and what is that like? And so, you know, as we've progressed this, you know, we've given you resources to research. You know, certainly bounce off of those for other evidence-based things. We are available for contact. Certainly if you have any questions or specific case study, again, this is just an opportunity for you to kind of take that a little bit further for these kiddos, with ASD and how that we can provide successful treatment interventions and meet the children where they are. So we just want to thank you for attending our course, and we hope that you enjoyed it.

- [Fawn] Thank you everyone for joining us on this three part series. On the impact of motor learning for the child with autism spectrum disorder. And thanks again to our two presenters, Lisa Roehl and Mariah Woody, thanks again.