Incorporating Movement Activities to Improve Joint Attention and Executive Function for Preschoolers with ASD, presented in Partnership with Thieme Publishers

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- [Amy] Once again, welcome to our webinar today. Incorporating Movement Activities to Improve Joint Attention and Executive Function for Preschoolers with Autism Spectrum Disorders. This is part one in a four part series created in partnership with Thieme Publishers and our presenter today is Kelly Vess. She has over 16 years of experience specializing in preschool age interventions. She researches and develops evidence-based assessment and treatment practices that focus on optimizing therapeutic gains within realistic caseload and time demands. Kelly is also a clinical instructor for Wayne State and Eastern Michigan Universities and in collaboration with Wayne State Universities SLP program, she develops and directs evidence-based intervention programs for diverse populations of preschoolers. She is also the author of "Speech Sound Disorders: Comprehensive Evaluation and Treatment" from Thieme Publishers and we're very pleased to have her here today. Kelly, welcome and I'm going to hand over the floor to you. So you can unmute your mic.

- [Kelly] Thank you so much Amy. My name is Kelly Vess. I'm just gonna go through the financial disclosure here. Here it is, okay. I am a full time employee at Barnes Early Childhood Center and I am author of the "Speech Sound Disorders: Comprehensive Evaluation and Treatment" for Thieme Publishers in which I do receive royalties for book sales. I also received an honorarium for this presentation. Because autism is such a multi-faceted disorder, I had many, many contributors work on this presentation with me including as you see their names, occupational therapists, physical therapists, child development doctor, teachers, music therapist, behavioral specialist, social workers and I had a great assistance from the Wayne State University Clinical Director Karen O'Leary. The interventions that you're going to see in this web seminar were developed by Wayne State graduate university students, Katelyn Adams, Holly Flynn and Torey McNally alongside myself. So I'm going to begin with a story of what brings me here and I'm going to start with a story of how I started my career as a speech language

pathologist 16 years ago, or more than 16 years ago. And I am someone who is an avid reader of research and I can tell you every detail of my practice and what the research behind those details are because the details matter when it comes to assessment and intervention. In one detail of my practice, when I started off, is I would work with preschoolers with autism sitting at a table. In my, I used evidence based practice. I did activity based intervention. I used a match of rewards and the activities were educationally rich and developmentally appropriate but my reasoning for sitting at a table at that time was because I could control distracting stimuli. The child sitting in the chair had good postural control and I was able to get, I felt, more repetitions of my communication target because of the structure of the physical environment. So one of the students I first worked with was one of my superstars and she could fluently request her wants and needs across people, across settings and I had great hope for her for the future. So then I'm going to fast forward six years into the future and I had the great opportunity to go and visit her in the fifth grade and what I saw was heart wrenching. I saw a girl who was rocking violently forwards and backwards in a chair and I walked in and she said, without looking at me, no eye contact, she said speech with Miss Kelly.

Now she hasn't seen me for six years but she repetitively said speech with Miss Kelly over and over and over and over again and I asked the teacher, does she rock like this often and the teacher said, oh she rocks a lot. Yeah, she rocks a lot like that. And I looked at her and two words came to mind, locked in and I thought this child is locked in from the environment around her and I thought this child is locked in from interacting with people around her. And the saddest part, I thought, this child is locked in from her own body. And then, I'm just looking at her and what came to mind is what the communication experts say non-verbal communication is 80 to 90% of total communication. And I looked at her and that was a fork in my road and in changing my career and changing the direction of my therapy. And I changed directions to add movement into my therapy and over the years, so this last past 10 years over the last

past 10 years, my practice has been evolving and I've been adding more and more movement and these children quantitatively are making better gains but qualitatively what I'm seeing is more socialization. So that's what's really exciting is these children are checked in. They're totally engaged in mind and body not only with myself but with each other. So I'm very passionate about this webinar and the information that we're going to be sharing because I know what a difference it can make using movement in your practice and in therapy both quantitatively and qualitatively. And this is across preschoolers of diverse populations of preschoolers and across diverse domains. Across domains of literacy, language, speech sound disorders, augmentative communication, social communication, academic skills. So I'm very, very excited to be here and share this information because I know it's going to make a difference for the children you work with as well. So we have four seminars. I'm starting with the basics 'cause if you don't have joint attention you're basically not going anywhere.

Establishing joint attention is gonna be step one and then we're gonna get into more advanced skills and the second webinar, we're going to look at balance to improve proprioception or where the child is in space and improve the intentionality of movement so movements become less involuntary and more voluntary. Then in the third webinar series, we're going to increase the complexity of movements and we're going to look at tactile stimuli in perceiving tactile stimuli and then finally, we're going to get to the most complex skills which are visual and auditory processing. So the series goals are twofold. First of all that participants learn how to comprehensively treat preschoolers with autism spectrum disorder by addressing motor skill development within therapy sessions. Secondly that participants will be able to incorporate task oriented, meaningful movement activities to improve motor skills, joint attention and executive function skills within therapy sessions. Now the first session we're looking at here is incorporating movement activities to improve joint attention and executive function for preschoolers with autism. No more clowning around. So there you see he's wearing clown shoes that are cut out of shoe boxes. Let's get to it.

In this first series, after this course, participants will be able to describe the latest research on cerebellar functional and structural abnormalities in children with autism and how to effectively target the cerebellum through movement activities. Next we're going to be looking at how to identify components of executive function from ideation to task completion level and describe how to target executive function through movement activities. Lastly they're gonna be able to describe task-oriented movement activities versus process-oriented movement activities and how to implement task-oriented activities to maximize psychomotor gains. So first we're gonna look at the prevalence and the impact of motor impairment for preschoolers with autism spectrum disorder. I'm gonna start with the bad news. The bad news is that it's estimated that approximately 75 to 80% of children with autism spectrum disorder present with concurrent motor impairment. Not unfortunately, these children are no more likely to receive physical therapy services than their typically developing peers.

So they are being very, very underserved at this time. The good news is that research indicates that interventions provided by adults such as speech language pathologists who are not trained in occupational or physical therapy can bring significant improvement. Can we do occupational therapy or physical therapy, no, but we can make a difference in teaching children and improving their fundamental motor skills. So movement really matters. Children with autism who have poor motor skills are more likely to present with an increased severity level of autism globally. So this is to include, if you have poor motor skills, it's related to an increase in repetitive behaviors and an increase in impairment and cognition, increased impairment in expressive language increased impairment in social skill development. So motor skills matter. Importantly motor imitation is very important at preschool age and it's predictive of expressive language outcomes at school age. Motor imitation is just one of those foundational skills that's so important for learning that you can see and then that you're able to do. And lastly, I wanted to add that in 2013, this was a very interesting addition under the core eligibility in the DSM five of restricted and repetitive behavior, they added

perception which is hyporeactivity such as the child has their hand on a stove and the hand is burning and the child doesn't even realize it or hyperreactivity in which the child's in an 80 degree room and it feels like a 140 degrees and he's breaking out in hives. So they added perception to sensory input and having unusual sensory interest under the eligibility of restricted and repetitive behavior. Now, the role of a speech language pathologist is to follow science not psychics. If we are going to help these children, we need to look at the current scientific evidence available that is causing these children to have difficulties. We need to look at the neurological differences in populations with children with autism spectrum disorder so we can target those neurological differences and make improvements for them. We need to not act like psychics and what psychics do is they think they know what the child with autism is thinking. They act like mediums. They say the child is not interested in playing with others. That is an example. The child is not making eye contact because the child is not interested in people. We are not mediums.

We do not know what the child is thinking and we are not helping the child by mind-reading. So, we're going to look at joint attention. Joint attention is a pre-verbal communication skill in which a child and adult attend to the same object or event, gestures, eye gaze, communicative vocalizations are usually indicators of joint attention. Not all gestures are equal in value. There's gestures that are known as deictic gestures and these gestures are the golden apples. These are the gestures that we want to see. Scientist thinking so they would say that if you have poor postural control, this would negatively impact your ability to use gestures make vocalizations and have eye contact. So I want you to just come with me and I want you to feel what it feels like to have poor postural alignment like many of our children do. So I want you to round your back with me physically, hunch your soldiers forward and let your head hang forward okay. This is called poor postural alignment. This is how many of our children with poor postural control hold themselves. And what I would like you to do is that one deictic gesture that's very, very important. I'd like to you to point your finger

up to the ceiling keeping yourself hunched forward, rounded back, head is hanging down and just feel how laborious this is. How you have to use your shoulders, your elbows, your fingers, it's very forced. Okay we're gonna come and bring our fingers down. Now just open your heart. Let your shoulders fall down your back. Eye gaze forward and now point up to the ceiling and just feel how effortless that is. The difference of having good postural alignment. So once again, now we're gonna round our back, round your shoulders forward, let your head hang down in front of you. Now we're gonna look at the ocular motor control. Just look to your left with your eyes, feel how hard that is. Look to the right, looking up and looking down. You do not have the strength through the core helping you with your distal movements right now. So we're going to open our heart. Let your shoulders fall down your back and now once again, eye gaze forward keeping your head still. Look to the left, right, up and down. It's very effortless. So now let's look at our speech motor skills. So I'm going to once again, round my back, hunch your shoulders forward.

Let your head hang in front and I'm going to say, this is a fantastic presentation okay. This is a fantastic presentation. You can feel your jaw is so effortful. The tongue movement is so effortful and we're gonna open our heart, let your shoulders fall back, eyes forward. Now we're gonna say this is a fantastic presentation. So when you have poor postural control it definitely impacts the distal muscles that you need to use when you're engaging in joint attention okay. Now if we're thinking like a psychic, and we see a lack of joint attention, you're gonna say children with autism spectrum disorder who lack joint attention skills, and we don't wanna think like a psychic, do not have the intention to communicate. They don't want to communicate. The psychic thinking as science motivation, a lack of intentionality behind the restrictive and repetitive motor behaviors. So you'll hear things like, children with autism spectrum disorder repetitively flap their hands because they're visually self-stimulating. They find this pleasurable. Children, they're repetitively making sounds because their auditorily self-stimulating because they like this. They lack eye contact with us because they have greater

interest in objects than over people. This does not help the children with autism at all, being a mind reader and so we're going to shift our thinking and think like a scientist so we can target the underlying causes of what we see which is a lack of joint attention. So the iceberg we see is a lack of joint attention with another person or an object, an object or an event by the child and this joint interaction, it lacks communicative eye gaze. It lacks gestures. It lacks vocalizations. This is just the symptom. What we need to look at is the underlying cause and we can do that by tipping the iceberg over. So when we tip this iceberg over we're gonna see there's a lot under there and if you look from the left to the right, we like to go and just work on the speech and language impairment but everything left of that needs to be taken care of before you can work on the speech and language impairment. So if the child is dysregulated, which many children with autism spectrum disorder are, simply because they don't know where they are in space because of perceptual difficulties.

Putting them in their amygdala, fighter or flight mode, is gonna be really hard to have a social interaction. And then we look at attention. We know that children with autism tend to present with difficulty orienting attention so if you have a bit at communication, you say, look, which is highly, highly predictive of later language outcomes, if the mom says look, and the child has difficulty orienting the attention, then they're not going to be able to have joint attention there. And then you can see maintaining attention, maybe the mom, the partner only has one turn with them then they're off and shifting attention. A lot of children with autism spectrum disorder present with visual fixation for instance. They'll be staring at the wheel and it's very hard to stop and shift attention. So we also have an increase of motor impairment which we talked about before that is pretty global. We have an increase in sensory perception difficulties. A new one is introception which is physical discomfort that the occupational therapy community just recently started talking about but some children for instance, would find their bowel movement to be painful experience. So suppose the child's holding on to a bowel movement for two weeks and is preoccupied at that. It's gonna be very difficult to

engage in social interaction. Next we're going to look at auditory processing. We know that children with autism spectrum disorder tend to have difficulty with auditory processing and once again, we're going to get into if someone calls their name, it's likely they didn't even hear it. It was too fast. So then what is really important is responding to someone else's social bid, they didn't respond to that social bid. So now we're looking into, now we're getting into higher level skills. Executive function, things are starting to get intact and now things are intact we can do some. We find that they have difficulty with planning activities and programming activities. We know children that have difficulty initiating activities. We know children that have difficulty programming activities. They know what they wanna do, they just don't know how to do it. We have children that have difficulty reprogramming activities.

They'll walk right into another child and not change their gait. So with executive function and there we go into the work and then maybe we'll talk more about that later and we know children that don't take task completion. This is another skill that children with autism spectrum disorder tend to have difficulty with but you can see how that would affect joint attention. Now lastly, we're getting into this speech and language impairment. They're more likely to present with dysarthria. They're more likely to present with a apraxia of speech. They're more likely to present with atypical speech errors which is really interesting. I love studying children that just begin to talk because you can kind of see what they're not perceiving and I will give you an example. Because they just learned to talk, a lot of my children with autism spectrum disorder have difficulty saying oral stops and this is something I've researched as well So oral stops are 30 to 50 seconds in duration, milliseconds in duration. They have an easier time with vowels which are longer and with the s sound which is the longest sound in our language which is a 130 to a 150 milliseconds long. So I was listening to my children with autism spectrum disorder and they were making, they were saying things like this, they were saying, sauce, for dog. Remember, d and g are 30 to 50 milliseconds long, very short. They probably aren't even perceiving those sounds.

Sauce is three to five times longer than s is. So they're saying sauce for dog. What parent is gonna know that they're talking about a dog when they say sauce? So the ramifications of this are huge and it's something that oral stops are cross linguistically how we address our parents. So if you're not perceiving the oral stops, papa, dada, gaga, how are you gonna produce them? And how are you gonna call a parent's name or address a parent? So it's a very, very serious issue, the auditory processing issue and how that effect, if you can't perceive, you can't produce, what you're gonna produce in your speech. So here's some other, the whispered speech, if you don't hear it, a lot of our children whisper, then no one's gonna respond to it. And I think this number is too high and I hope this number changes. 25 to 30%, the recent research says, of children with autism will remain minimally verbal in their lives. So we really need to better treat these children and target these underlying neurological differences that are getting in the way of them learning to communicate.

So in thinking like scientists that was a lot. That slide was a lot under the iceberg that we saw. It's a little bit overwhelming. It's very multi-faceted with the neurological differences that we have to deal with. The question we can ask is how can we comprehensively target these neurological differences that can impede joint attention therefore impacting both non-verbal and verbal communication. The question is how can we target a multi-faceted disorder that impacts emotional regulation, attention, perception, auditory processing, motor impairment, executive function and also speech and language development. It's overwhelming right? Well, this is kinda fun. There's something called, a phenomenon known as translational lag and that's when the research is ahead of our practice. So for the past decade, the neuroscience community has said you need to target the cerebellum if you wanna receive optimal gains in children with autism spectrum disorder. They have structural and functional differences in their cerebellum and the cerebellum is responsible for these deficits that we're seeing right here. So as of 2019, there was a doctoral dissertation done of a student from Bowling Green, she found that there's absolutely no published

interventions on how to target the cerebellum for children with autism spectrum disorder. So this is kinda fun. This is kinda star trekky. We're kinda on the final frontier here and we are going to get into how do we target the cerebellum. So, let's first learn about the cerebellum. The cerebellum, numerous studies have indicated that structural damage and functional connectivity abnormalities in the cerebellum in individuals with autism spectrum disorder are related to deficits in speech, language, fine motor, gross motor, perception, emotional recognition, cognition, visual spatial reasoning and behavior. So, let's learn more about the cerebellum. While the cerebellum only represents about 10% of the pediatric weight of the whole brain, it contains approximately 75% of the brain's neuronal cells. About 200 million mossy fibers connect to practically every area of the brain and it plays a pivotal role in movement, again cognition, language, emotion perception, visual spatial reasoning, executive function and behavior. So this is the CEO of the brain. It connects to all the ares of the brain and it calls the shots.

It says, it decides whether we're gonna act or whether we're gonna not act on something. It's very, very, exciting and it's where we wanna be if we wanna make a difference. So the anterior portion of the cerebellum is the motor portion. It's responsible for motor coordination, motor accuracy, motor consistency, limb movement, walking, standing, talking and eye movements. Previously it was believed that the cerebellum is primarily for motor purposes and that's because in the past, the brain imaging scanning, the brain imaging, was not good enough to see the posterior portion and now with recent developments, we see in the posterior portion is where the higher level thinking is taking place. So in the posterior portion we have post-posterior portion, we have cognition, language, emotional processing, emotional regulation, visual spatial processing and executive function. So, executive function is very, very important and the recent research indicates that preschoolers with good executive function skills do well in school age. What is executive function? Well there's three components of executive function that are commonly agreed upon. Attentional

flexibility, which is the ability to both pay attention and shift attention from a task, working memory, which is the ability to hold and process information, and inhibitory control which is the ability to stop an impulse and select a more adaptive one. I'm gonna give this simple example of cleaning up. For instance, the teacher says, clean up. The child attends to the teacher's direction that shows attentional flexibility. Working memory, the child remembers clean up means it's time to put the toys away. Inhibitory control, even though the child wants to continue building, the child decides to put the toys away. It's pretty simple, executive function actually. So I'm going to go over again, example of three components of executive function again. Here's a scenario, Jung grabbed toys from his friend. His teacher emphasized that Jung could have asked, can I have a turn please when he wanted toys. Jung independently learned to ask for toys from peers as the school year progressed. So Jung demonstrated attentional flexibility in paying attention to his teacher's direction. She said, can I have a turn, you paid attention. He demonstrated working memory when the next day he recalled to ask for a turn by asking can I have a turn please and he demonstrated inhibitory control in refraining from grabbing toys from his peers. So now we're gonna look at our first video and this girl, this is Camper Ida and she has a job to do. She has to gather all of the camping materials for the camping trip. Very important work and what I want you to look at and there's a couple of examples to see if you can find one in the video an example of attentional flexibility that she demonstrates. An example of working memory and an example of inhibitory control okay. And you can, then after you find it, you can ask yourself why would you say it's attentional, why would you say it's working memory and why would you say it's inhibitory control. Melissa, let's move to the video please, thank you.

- We have a problem. Our problem is we need our supplies. Our plan is to go through the river and the woods. Ready, first, first, can, you, scrape it out. Please, let me see your please. Please, then can you, where's your fingers at, you spray me. Lastly, let me see your I's. Lastly, let's you stretch it on please. Oh, let me hear your please. Because

I have angry, really scary with your angry dog, angry, even more angry. Dog, teeth, wow, those are scary dog teeth. All right, action. We're gonna go over the river. Uh oh, we need our band aids. All right let's take our first aid kit over the river and the woods. Look, there's some fishes. Here they come, watch out for them. You're over, whoa. Watch out for the fish. Gulp, gulp, gulp, gulp, gulp, gulp, gulp, gulp, Oh you're coming up to the rocks. There's a bear back there, grrr. Oh, look at you navigating. Wow, watch out for that bear, grrr. We're almost to the wooden bridge. We're gonna be safe on the bridge. Nice navigating over those rocks. Okay, let's put our first aid kit in our bag. Wow, you got it, let's try again. Whoa, look at you. All right through our tent. We're almost back to our red chair. We're getting our supplies filled up. Oh wow camper, you are a cool camper. Okay, let's do our last step. What's our last step? We get to check it off our list, yeah, that's right. Here you go. Okay, which one did we get? I'll take that, thank you. Did that look like what we had? Did we have this one or the first aid kit? Let's try crossing off the first aid kit down here. Check oh nice checking. Okay.

- [Kelly] Okay, thank you. Back to the slides please Melissa. Okay so there were many, I'll wait till it comes back on. So there were many examples in the video of her demonstrating attentional flexibility, of her demonstrating working memory and of her demonstrating inhibitory control. I'm just gonna share one example okay. So I saw she demonstrated attentional flexibility in orienting her attention. She was rubbing her hand on the filing cabinet in the beginning and Miss Torey used a completion prompt, she said we have a and Ida said problem and joined her. So she shifted her attention to her and did the problem tact with her. An example of working memory is she remembered to say her request paragraph and the multi-modal cues that go along with it. She was able to bring that out to request in order to engage in the fun activity. And inhibitory control, she didn't take a break inside of the tent and lie down, she went right through the brain, the tent, and went off to her checklist to check her camping material. So populations at risk for cerebral abnormalities or damage, this is just for your

information. If there's other children that you work with, this is along these disorders. They're also finding that there is cerebral damage in these populations as well. So when we look at cerebral damage, it's estimated, if you look at a child that had a brain injury or had a pediatric stroke, that's simply resulted in damage in the cerebellum area, 37% of these children will present with autistic like symptoms. So this is very important. If the damage is in the cerebellar vermis, this damage in the middle of the left and right cerebellums it increases to 80 to 100% of them will demonstrate autistic like behaviors. So what is the cerebellar vermis? The cerebellar vermis, listen to what it does. It connects the left and right cerebellum hemispheres and it plays a key role in balance, proprioception, coordinating speech, eye, body movements, specifically along the extremities. So if you think about the children with autism spectrum disorder that you work with, and you think about the cerebellum, and you think about if there's damage to the cerebellum, these are the behaviors you're going to see. We're just gonna put two and two together and the girl that we're going to look at in the next video.

She does not have autism spectrum disorder. Her neurologist differentially diagnosed her as not having autism spectrum disorder but having an underdeveloped cerebellum which was the result of being extremely premature. She was born I believe at 27 weeks okay. But one thing we're gonna look at when we look at a video of this child that has a damaged cerebellum. I want us to look at her postural control and postural control is actually a big word because we're talking about the muscular tone of the core. We're talking about the postural alignment of the core and we're talking about the core knowing where it is in space, okay. Very, very, very important. If you wanna know what it's like to have poor postural control, you can try sitting on a ball, a workout ball and trying to get your work done. Not one of those chair ones but a real workout ball and feeling how difficult it is to have postural control. Now, next we wanna look for disassociation. Disassociation is when they're using the distal muscles independently of the proximal muscles. So we have our core, we have the proximal muscles which

are next to the core such as the shoulder, the elbow, the wrist, the distal muscles we have are the fingers okay. So for example, turning your neck while you keep your trunk forward. Just turning your neck, that would be an example of disassociation okay. When you're reading, not moving your head back and forth but using your eyeballs and moving the eyeballs left to right. That's disassociation okay. You're keeping it still, the proximal muscle, the distal muscles are moving. Differentiation is the progression of maturity of movements to more precise well controlled intentional movements. So if we can think about, we go from immature to mature movements. When a child learns to walk, they begin with a shuffled straight leg, hip generated gait and as it becomes more differentiated over time, they begin to use their knees and then they begin to use their ankle flexion and lastly they're gonna use the toes and it creates a more differentiated movement over time. And lastly we're gonna talk about integration in which you're using two different muscle systems to function together. So you can see an example in this video here. She's pulling herself up with her core strength using her arms and she's climbing up alternatively lifting each of the knees.

So you have two different muscle systems working together. A common example is cutting out a circle. You're holding the paper with one hand and you're snipping with the other and they're working together in integration okay. After the muscles have become differentiated. They have that smoothness. So please let's see the next video please. I'm actually going to be pausing this video to show you different areas and you can see in your slide video 1.2. When I look at postural control, what I see with her is her head is hanging forward, her shoulders are hanging forward and even a bit spastics and she has a rounded back. You can't really see that in the video. So she has poor postural control. Now when you look at the gross motor control, I want you to look at how she moves her arms as she's walking.

- Let's jump into the pond. Jump into the pond to save the frog.

- [Kelly] So you see that gross motor control, that immaturity, she's not swinging her hands side to side as she walks. She's holding them up. I don't know if it's a spastics reaction or if it's for balance but she's holding them up like a waitress on either side holding two trays. Now, let's go on. Pay attention to the fine motor control. Let's look at her eyes here. This is a five year old girl by the way.

- You're jumping into the pond.

- [Kelly] Now she's gonna reference a lot of things. See how she can use her eyes in reference it very well.

- Marker. Let's take lily pad number three.

- [Kelly] So Deenie's job here, I don't know if I can talk over. Deenie's job here is to find the frog's lily pads. There's five missing lily pads and she's checking to make sure that they find all five. Notice how there's a lack of disassociation. She's moving her hand with her shoulder, with her elbow. She's not moving her fingers independently as she writes.

- One last time, we'll see how it works and then we'll mix up tomorrow ready? I wanna see your most scary dog teeth. Are you ready?

- [Kelly] Now let's look at her fine motor control here of her fingers.

- You ready, yeah, okay.

- [Kelly] So you can see that she's unable to grasp and point. Independently.

- That's the frog. Look at the frog. Okay, let's jump into the pond.

- [Kelly] Now Katelyn does a wonderful job here. She knows she wants that marker but she's gonna go right back to that board 'cause she wants to go over to the marker. There is times where Katelyn has to lay her hands on the child and that is to get her away from the board but she lets her struggle and independently figure out her own body.

- Jump into the pond. You're in the middle of the pond, yeah. Here's lily pad number four.

- [Kelly] Watch the way that she walks. If you can see her walking, her legs. This is what I call a lack of differentiation. You can't see, she's bending her knees but she's not flexing her ankles or her toes. She's keeping them stiff so there's a lack of differentiation. She's using her hips and her knees only to walk.

- [Female] Move on to our next station.

- Right there.

- [Kelly] Now next we're gonna look at integration when she climbs and see if she's able to use her hands at the same time as she's using her legs.

- Here's one more lily pad. One more.

- [Female] That's gonna be slow like a turtle.

- Look at the frog. Look at the frog. Let's jump like the frog into the pond.

- [Kelly] She really wants to get right to that writing here.

- Let's jump into the pond.

- [Kelly] Now watch her climb here.

- Jump into the pond.

- [Kelly] She doesn't do it together. Hands or knees, not at the same time. That is called a lack of integration. Now she does, this is great to watch at the end. She's being very brave. Now we talk about her motor planning, programming, execution if you notice, she's very slow in initiating action. Very difficult and the programming she overshoots. She walks into the board and she almost falls down. That's an example of that. And look at her execution is very slow and labored. I think here this time, you're gonna get to see her walk. Notice how it's just knees and hips.

- [Female] Nice, nice, awesome.

- Let's circle lily pad number five. I heard your talking.

- [Kelly] And that was the only one vocalization that she made the entire time. Okay, we go, back to the slides please. Thank you. Okay. So now we're going to look at psychomotor functioning. How do we target the cerebellum? How do we do this? And what I would say is, what we do is we do activities that the cerebellum is responsible for and we do them at an increased level of complexity to challenge the child. 'Cause when you challenge the child, that's gonna create neuronal change in the brain. So psychomotor functioning is this interaction between the brain and the body and producing movements to solve problems. So when you engage in complex motor movements, you create in the brain, complex motor connections. Psychomotor functioning is improved through intentional, complex movement tasks enacted by the

child with autism spectrum disorder. These tasks create complex neuronal connections that require the child to plan, program and execute tasks. So what I wanna do, my whole goal in therapy is to light the cerebellum up like a light bulb. So what I do in therapy is I incorporate tasks that the cerebellum is responsible for at an increased level of complexity. So how do we, we need to know, how do we make things more complex? So let's look at how do motor skills generally develop in children. They develop from involuntary as you can see that's the Palmer grasp, a newborn child will hold your finger to voluntarily. Here you see her doing her angry dog paws as she's imitating Miss Torey, the child is. We develop from gross motor first, the arm movement which you saw was very poorly developed in the last video before we can get to the fine motor movement and you saw her hand movement was very, very poor. She couldn't even grasp and pick up a picture. And then we develop from head to toe so first the child learns how to lift their head then the child can lift their chest, then the child can lift crawling position, the hips and the torso and lastly the child can go on the child's feet. So to comprehensively treat preschoolers with autism spectrum disorder we wanna focus on their mind, the heart and their body. And you're gonna see this for every clip that you watch. When I go into the mind, I want to apply the complexity approach to increase neuron activity.

That means I want to challenge the child in the area of pragmatics, syntax, semantics, phonology, literacy and executive function. Because challenge equals neuronal change. When you have the child do something that the child is not currently able to do, you're changing the brain okay. As far as the heart is concerned, I wanna increase the mirror neuron activity through engagement in imitation. So it's very important to form a positive relationship with the child because the research indicates that if the child has a relationship with you, that's gonna increase the mirror neuron activity. The mirror neuron activity is when they see you do something, their brain lights up as if they're doing that activity as well. And it's great for empathy because if they see you crying their mirror neuron activity lights up as if they themselves are crying and that is

how empathy develops. We wanna encourage motor imitation because research indicates if the child is motorically imitating you, there is an increase in mirror neuron activity that is practically double. We wanna encourage verbal imitation. But did you notice we're gonna talk slower and we're gonna use our limbs so that they can join you in perceiving the speech and producing it with you. We wanna encourage motor imitation the same thing, by moving slowly. I hope you saw this, take your hands out, you, give the child time to perceive it and join you. And we're going to motor imitation results in improved motor development. It's very, very important and we're gonna sportscast the child's interest in actions in the moment to increase joint attention and we're gonna respond enthusiastically with heightened emotion to increase joint attention. We're just gonna get through all of that visual and auditory static and we cut through with enthusiasm to reach the child. Okay, lastly, the body. We're gonna incorporate task-oriented activities to improve psychomotor functioning in which children are given a meaningful task or occupation to creatively and independently use their own bodies in the environment to solve multi-step complex gross and fine motor challenges through task-oriented.

Solves these cues and these cues we invented ourselves and they are in my book which is planned to come out in April 2020 and basically as you can see from the cues, they're temporal cues. That's what they're called, in which you're using space and you're making, you're making speech loud with body movement okay. So yeah, we invented the cues ourself and their highly, highly effective. And what I like about the cues, I like the cues for two reasons okay. Well there's a few, there's many reasons actually but what I like about the cues is that children are engaging in motor imitation okay. When we do the cues with them. But also it allows us to remove the verbal prompt and then they're able to easily remove the verbal prompt and they're able to carry on. And what the cues, what the cues importantly do is the cues help them perceive speech. So they can perceive speech visually. Knowing the auditory is a weak area for them. Oh, I'm sorry, thank you so much, okay. Okay, okay, okay great, okay.

So here we go. Thank you for asking, that's a great question. Our parents trained to learn the cues as well? Yes, they are. I show them typically after therapy. I will show the parents the cues. I'll demonstrate them directly. I also use a YouTube clip in which I demonstrate myself using the cues with the child and I'll email that to them. Thank you for that great question. Okay, the name of the book coming out is "Speech Sound Disorders: Comprehensive Evaluation in Treatment." The book is, if you end up buying the book, I have two words for you, you're welcome. It's an amazing book. It has 120 video clips of graduate students and each video clip is very important because it shows a unique evidence-based strategy. So my library of video clips is about a thousand right now and I picked out my favorite 120 and each of them have a unique tool. Okay, students find that, yes, yes. I'm not sure. I don't work in a mixed model preschool, special education classroom Christina so I'm not sure about that.

- [Amy] Kelly this is Amy. Someone was asking if, like do you have a link to where the book might be available or can you tell us where it will be available once it comes out?

- [Kelly] Okay, yes, the book is expected to come out in April 2020 and the book is with Thieme Publishers which is on the slide here, t-h-i-e-m-e. And the book is more than just speech sound disorders, it covers behavior. It covers literacy. It covers language and so it covers, and it covers developing educationally rich activities.

- [Amy] And we just put the, Melissa and I were working in the background so if to our audience members, if you look over on the left side under the handouts pod, we do have the information about the book there.

- [Kelly] Thank you. Okay.

- [Amy] And um, Kelly.

- [Kelly] There was.

- [Amy] Sorry, go ahead.

- [Kelly] Okay, well thank you so much. I look forward to seeing you next week. Thank you so much to speechpathology.com and Thieme and Continue Ed for this wonderful, wonderful opportunity and I look forward to seeing you next week.

- [Amy] Thank you so much Kelly. We look forward to seeing you as well for part two and just so everybody knows, the next four parts will be one week apart so the next three Tuesdays we'll finish parts two, three and four of this series. Thanks to our audience for being here and thank you so much for your patience with the technical issues. If you have any questions about those or accessing your exam or anything else, I've put my email address over there in the pod on the left. Thanks for very much Kelly. I'm gonna wrap up the classroom so we will close here. Thanks everyone.