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Executive Function in Children with Autism Spectrum Disorder

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- [Fawn] Today's course is Executive Function in Children with Autism Spectrum Disorder. Our presenter today is Dr. Cara Koscinski. She's the author of the award winning, "Pocket Occupational Therapist" book series, is a pediatric occupational therapist. She specializes in trauma informed care, behavior, interoception and autism. As an educational speaker, Cara incorporates her expertise as a mother of two children with autism. She's published six books and has over 98,000 followers on her blog and social media channels. She's also a children's yoga instructor. In addition to her books, Dr. Koscinski regularly blogs and creates fun products for those who work with children who have special needs. She serves on the advisory board of "Autism Asperger's Digest" magazine and she's also an instructor for the University of St. Augustine's occupational therapy program. Welcome Dr. Koscinski, so glad to have you back.

- [Cara] Thanks, I'm really happy to be back talking about executive function today. So I'm happy everyone is here and I'm very excited because I've done my capstone, since I've taught a course on executive function. And there's so much more information that I have to share about it that's based on the last five years research and some product appraisals of some articles that I found that are really helpful. So it's important to get this information out and talk about some research and then how we can help our clients with executive function disorder. The most important thing that I want to say is that we've got to kind of have a mindset shift, when we're working with kids with any behavior issues, executive function and especially autism. Because we've got to think that every child wants to succeed, nobody wants to fail. I know you don't wanna fail your test or in your job or in your life and these kids don't wanna fail either. So it's one of these favorite quotes that I have is from Annette Breaux and it says everyone in the classroom has a story that leads to misbehavior or defiance and nine times out of 10, the story behind them misbehavior won't make you angry, it will break your heart. And I

was reminded of this quote yesterday as I was volunteering in a school around the area here with my students. And we had a lot of kids in the foster system and the kids just lacked attention and not many had IEPs or 504 plans and they really just wanted our attention and they were misbehaving not out of willfulness behavior but they just wanted some attention. So it was important for me to see that and refresh my brain, it was this mindset shift.

But today we're gonna talk about executive function and what is it? How are we gonna talk about it and describe it? And how important it is to the occupation of children with autism. The second thing we're gonna do is summarize the meaning of Theory of Mind and its effects on daily living tasks. Theory of Mind is something that until I had done the research in the last two years, wasn't even aware of as much as I was looking at the impact on executive function and if we don't consider this critical component, we're missing the boat on executive function. So that's something we're gonna talk about today. We're also gonna be able to at the end of this list at least five interventions, for building executive function skills. And these are all gonna be based on the, "Occupational Therapy Practice Framework" the third edition. And for those of you that aren't familiar with this document, you probably should print it out and put it on your desk and hang it up and refer to it quite often because it is the critical way that we should document and look at our clients based on the most recent research and evidence that's out there. So it's very important for us to become familiar with this.

And at the top, I wanna just show you that bright brain is up there at the top on the right and we're gonna use bright brain which is in my interoception book. I created characters for helping students to learn about their body and I wanted the characters to be happy and cheery so that they could visualize the brain without, kinda making it too anatomically correct. So I put bright brain up there so that you know that when you're helping your students you can say, "Oh, bright brain is on now." And maybe use little characters from some of my work and there's even free downloads on my

website, regarding these things to try to help you to have tools to work with kids. Just a tad about me. I do have two children with autism spectrum disorders. My Jacob is older, he's the 19 year old and my younger son is 17. So I've gone through quite a bit of therapy on a personal level to help my children with occupational therapy and function and ABA therapy. And I also, so I work at the special needs community, work with these families and children and I also raise them so I live the same life. So I'm hoping that we can, I can give you perspectives of both a mom and as a therapist. I am new faculty at the University of St. Augustine. I'm so happy to be here, I've been here three weeks and very wonderful school. I also help with the "Autism Asperger Digest" magazine. I'm the OT advisor and I write articles, I'm a contributing author for that magazine.

So I get to cover executive function so if you're not a subscriber, we do talk a lot about autism and sensory and executive function. So really good publication. I don't make any money from it, it's just in my volunteer work that I like to do to help. I also talk all over the country about autism, I speak with Temple Grandin, Carol Kranowitz some other, names that are, just we're out there helping families and therapists to do their best work with these kids. So, regarding autism, we have a website called "myHana.org" which is the bottom there. That website is something that we're developing as a service to families of kids with autism, it's in the works. And my own website, I'm known as the Pocket OT, the Pocket Occupational Therapist. So my website is www.pocketOT.com and again, I like to give free resources for caregivers and families and therapists. So that's important to me to share knowledge freely. My books are right there, I have them written in layman's terms for new clinicians or clinicians new to school and they also would pertain to families because educating families would be something that's so important, right?

The family education component. So much of what we do is carried over into the home. So that's important also. "Interoception", "Sensory Motor Interventions" and a

Mitochondrial book round out my publications at this point. So it's really exciting to be able to share my knowledge with everyone. And here's just some pictures. My children were on the "Autism Asperger Digest" cover, on the top right there. So that's what they looked like a few years ago, when they were smaller. So let's go ahead and get started. We need to give an overview of executive function which is going to be abbreviated EF, and autism which is Autism Spectrum Disorder so it can be autism or ASD. So we wanna talk about autism first. So we're all on the same page as we move forward. Autism spectrum disorders as the most recent statistics show that one out of every 59 children in the United States, has some form of autism. So one in 59 children.

Why I really want to hone in on executive function, in autism is because there's a really, really good chance that along the way you're going to be working with someone that has autism simply because of the statistical significance. The huge number of kids and adults that are diagnosed with autism. So it's a huge number and we need to remember that because we're gonna come across these kids, whether they're diagnosed or not, it's something we're gonna see. So we really need to understand how that disorder impacts these kids. The biggest impacts are cognitive, social, emotional and occupational capability. So when I'm talking about that, I'm saying that they can, 50% of kids with autism are verbal and the others aren't able to verbalize. But of those that are verbal, it's very difficult for these kids often to express themselves and further to look at social communication. So by definition, autism affects the ability to communicate reciprocally, in a conversation. A lot of these kids as you may know fixate on routines and it's hard for them to think outside of the box, everything is always the same way. So it's hard for these kids to solve problems and life is full of creative problem solving, right?

We have to creatively problem solve all of the time because nothing is black and white and that's really hard for these kids to understand. So what does ASD have to do with play skills? And this is specific to occupational therapy. Repetitive patterns of behavior

cause difficulties with transitions and other other issues. So if you think about a child with autism and if they're wanting to do things consistently and repetitively, they're going to do that to the , they're only gonna play with maybe cars or trains or whatever their particular interest in, they're gonna play with that item in a repetitive way. And then they're not gonna do this creative play that we see developed in typical kids, right? So they're not gonna explore and have imaginative creative play which is going to affect them as they develop and have to function in real life. Transitions are hard also. So moving from activity to activity or stopping something that's preferred in lieu of something that's non preferred or something that must be done. So that's tough. The other thing is the pretend play and it's symbolic play skills are limited. So if you think about how kids develop social play, they're using play on the playground even in creative ways. They're making up things, they make up stories, they may have imagination and things but they're not gonna have that if they have autism, that's very difficult for these kids.

So we know that as OTs, we know that the foundations of our whole profession say that play is how we learn skills. So you can see that these kids are at a somewhat of a disadvantage, right? Because they're not learning the skills that are critical for developing creative play and then they're having a lot of difficulty with occupational performance. So that's gonna affect them and then their executive function. Because executive function is something that also continues so we're born with a little bit of this frontal lobe and it's of course, we have our full brain as we're born, right? But executive function is something that develops over time and with practice and experience. Where is EF? Well, it's in the frontal and prefrontal cortex and we'll talk about that a little later. But we really need to know, even though it doesn't develop until age 25, we need to know in which order the skills come and what they do. And a lot of times when I'm teaching this course live, people will say, "Well, what difference does it make, "if it doesn't mature until adulthood?" Well, it's something keep in mind again that develops as kids play and learn. There's this slow progress of development and

connections that are made in the brain as kids play and develop. So it's something that we need to know when these things are supposed to happen because just like any other developmental assessment, we need to know the typical milestones that kids meet in order to see where they're lacking.

And there are two types of skills. There's thinking skills, which we know as cognition and doing skills which are behavioral. So components in the current literature. So as I did this literature review for my capstone project, for my OTD, I found it interesting that there's not really one definition of executive function. And I think that's why occupational therapists struggle with our scope of practice in this area, right? And if you look at the second article down here, lemme grab my pointer. Jocelyn and Meyer, they said that there are over 50 articles. I'm sorry, they reviewed 50 articles and found that there are over 30 constructs for defining, executive function in the OT literature alone. 30 different ways to define it. So that's confusing because we have, in the DSM we have one definition of autism, one definition of, I don't know, depression. We have these concrete definitions for other disorders but executive function comes as a comorbid condition or it comes along with some other conditions. So we don't have this nice pretty little bow tie definition.

The other thing is that we do know that Demetriou, is this top study said that planning concept formation and mental flexibility, response inhibition are very common characteristics, in a lot of the literature. The other thing is that OTs aren't recognizing that this executive function has critical impact, on performance of our kids. And I think we a lot of times, unfortunately, leave this to the speech pathologists, right? We say Oh, that's a speech issue but it really it's not. I think a lot of the trouble comes when there are, a lot of the trouble comes when we leave this to speech because then we see these functional deficits and we discharge our kids, when they meet the fine motor goals. When they meet the, yes, they can do this core muscle activity, their fine motor is fine, they can cross midline, they've got an appropriate grasp on the pencil, we're

gonna discharge. But if we never touch executive function, then our kids are not prepared for the critical things and IADLs that come in life such as writing checks, grocery shopping, preparing for a job, function on the job. So we really see a lack of skills in our kids globally.

A lot of people compare air traffic control to the executive function system. I feel like that's just a rudimentary comparison but it does fit if we want a gross definition. If you look at these people, in the air traffic control center, there's a heck of a lot that each one of them has to do. And there's how many staff members of the airport, right? They're running this air traffic control center. Well in our brain, it's just us, right? So we don't have, I guess you can think of these guys and females up here as neurons. These people are just making connections and figuring it out. There's so much going on. And what happens if an airplane comes in late or if it doesn't land properly, there's gotta be some flexibility, right? So there's got to be flexibility, in this air traffic control center. And these people can't do what they want to do, they've got to do what makes it safe and organized for the airport. Similarly, a child can't just line up cars and trucks all day, or spin wheels or do whatever their intense interest is, they've got to be flexible and stop those things in order to do self-care, for instance or handwriting, right? So there's a lot of components that are moving in many different directions, for smooth executive function.

So we know that we've got to manage tasks every day and this is the set of skills that we utilize. We have to decide at any given time and I could use you as an example watching my course right now. You had to stop something else to do this course, maybe because you wanted to do the course or maybe because you need continuing education hours. Your reasons for doing it are different than, someone else's reasons. Either way, you've had to stop what you were doing to attend to the course and that's executive function there and a lot of people miss the boat on that, right? That is critical because we can't always do what we want in life. And then when difficulties arise in

let's say, we have kids say, five minutes you're done, we're gonna do some handwriting or we're gonna do some exercising or whatever or even just take a shower, that child may have behaviors because remember transitions are difficult. So going from one activity to the other is often a challenge. So the child needs to not have all these behavior issues and tantrums so that is also executive function. Difficulties are gonna happen in life and we need to deal with them. Obviously, executive function helps them with independence because we've got to be efficient in life and use our energy and our resources wisely.

So there's these two types of skills, the thinking and doing. Thinking is the typical things we think about with executive function. It's the making of the plan, the organizing of yourself and the materials necessary for the plan. The managing of the time so looking at the appropriate amount of time and working accordingly. So I've got to do an hour long course, I can't rush through the course and have a half an hour left, right? I've got to manage that time. Well, that's something abstract. If you think about time management, it is not a concrete thing. Yes, we can see the clock but the concept of time is very, very difficult for some of our students that lack the knowledge of abstract concepts. So think about that. So we're gonna have to teach them all of these little skills, right? So do you see how even though executive function matures at age 25 years in young adulthood, really, we have to build these little components, throughout the journey of childhood and through play skills so that we can help these people become smoothly or smoother functioning adults. So metacognition is often thought of as, what is this thing of metacognition? The whole point of metacognition is that we can kind of step outside of ourselves. And I kinda feel like, if you believe in a higher power in the world, the higher power can look down on us and see how we're doing and kinda evaluate our performance. So we need to do that for ourselves 'cause no one is doing that for us.

So metacognition would be how are we doing and performing? And what changes do we need to make? And then the doing skills, response inhibition is to stop those behaviors. Control our emotions, attend for a prolonged period. How about task initiation? And lemme just tell you a very quick story about this, before we move on, I was working with some older students, some young teenagers probably between 10 and 13 on a task and I just said to them, we're gonna move the office around, how would you plan this office? We were just having working in a school system of how to best utilize their resources in the resource room that we were working in. And I said, "Let's move the room and let's put the desk "where the TV is and let's try to fix." I'm sorry, not TV, computer screen is and let's try to fix this and they really had no idea where to start or even how to begin moving things around that they just decided, they weren't gonna start the task at all. I think we see that a lot of times with our kids and we call them lazy, or we call them, we say different things about them but the honest truth is that they may not be able to start a task 'cause seems so overwhelming. And then flexibility is very hard. So this is, this is a lot of information so the neurology behind it.

So let's think about this, how brain connections form. Getting back to basics. At child's birth, we know that there are not a lot of connections in the neurons. So if you look at the left side there you can see that at birth, the neurons are not connected, they look like spaghetti. And we know that kids in any different world, in any different language, not world, I'm sorry, country in any different language can speak that language based on how they were raised. But look what happens at seven years of age. There's a heck of a lot of connections here, right? This brain is super connected but then what happens is at 15 years of age, the brain says, "Hey, I need to be efficient, I'm going to do the use it "or lose it principle where I'm going "to maintain the connections that I'm using "and keep them for efficiency." This is another reason when you're telling people, why are you working on executive function? Are you're trying to understand it yourself? You think we really need to make these connections and use them in those areas that I

said here. Whoops, I'm going back. Right here, we need to use all these things as we go because we want to strengthen, those brain connections throughout, so I hope that makes sense and the neurology there. And we know that pruning is occurring, for efficiency in the body. So regulation, I teach a lot of courses on behavior as sensorial behavior. It's so important to me to understand this and I think as a mom I wanna understand it but regulation is so, so critical. We need to delay the response, versus the immediate gratification. And we think about the difference between a two year old and a 10 year old. A two year old has no ability to delay that response or wait for that gratification. They can't wait, there's no patience there but that should come through maturity, right? And then if a behavior that we're having isn't working, we're able to stop that behavior and do something else but that's very hard.

What about managing distractions that can interfere? We are counting on these kids to automatically just reduce distractions, in the environment and within their own body and again, that's very difficult. So that's what I mean by regulation. All right, it also is our optimal state of learning. So throughout the day, you're not gonna be in the same state. You wake up in the morning and you're in a different state than when you go to bed. That means that we're tuning into our environment at that time and as our environment changes, throughout the day so does our regulation. So we can't be too energetic and we can't be too tired. We must be just right. So that's a complicated thing. What is just right? How do we find that just right challenge? So sensory comes in here but not just sensory, processing but regulation of our body.

Now, we know that if we wake up, this is one of my favorite slides ever and I use it in pretty much all of my courses. Here is our body, we have an optimal range of arousal. So throughout the day, we should be somewhere in this optimal range, between the two dotted lines. Do you see that? So depending on what happens to us, we should be a little bit more alert sometimes and a little bit less alert but stay in this optimal zone. Here's an example of what I mean. In the morning you drive to work and when you get

in your car, if you ever find out that your side mirrors and your rearview mirror and your seat are too low, you need to adjust them up a little bit, you're sitting higher in the morning, why? Because your body is more alert and ready to go and you have more energy. But by the end of the day, you're slouching in that car seat and you have to adjust those mirrors lower because it's just the natural state of things. You physiologically couldn't maintain the same level of alertness all day or else you would be exhausted. So that is gonna play into our interoception piece as we go forward here. So that is really important to teach kids and then you would use the, How Does Your Engine Run Program or the Alert Program. You would use those programs here to help your students to figure their just right area out, right? And you need to do it also 'cause it's just healthy. So then we talk now about the upstairs, versus downstairs brain. I love Dr. Daniel Siegel and at the end there's a list of resources. I saw a few questions coming in regarding resources.

There are resources at the end, everything I've spoken about is either cited or listed for you. But Dr. Daniel Siegel and Tina Payne Bryson wrote the book and this book is amazing because it's talking about "The Whole Brain Child". And if you think about the brain and I'm gonna grab my pointer here. The downstairs brain is the brain stem, that's what I'm talking about. The brain stem is when you are using that downstairs brain. It's where our fight or flight responses are. It's the physiological things like breathing, maintenance of heart rate, memory, things that keep us alive and in a regulated state. So the downstairs brain is more automatic. It's the hippocampus, it's the amygdala, it's all those structures in the bottom of the brain. But if we think of the upstairs brain, then we think about the cerebral cortex, right? Or the thinking, the play, the empathy, body control. So we've got to think about this. When a child perceives danger, they're in the downstairs brain, right? They're getting that fight or flight reaction. Well, when you're thinking of the downstairs brain, it is really, really hard to get out of that fight or flight response because it is chemically driven. So cortisol will be released, chemicals are released in your body for safety, that is the goal. But when

we're using our upstairs brain, so to speak, we're able to make conscious choices. So that's where metacognition and all of the higher level executive function takes place. But of course, when we look at the connection between the lower and higher brain, we need to practice making those connections.

So we need to practice, when things happen in the environment or when things happen in our setting or with our body, we need to use conscious choices instead of always getting into that fight or flight response. That takes practice. So the difference between a tantrum and for our purposes for this course, sensory is a flood of hormones. It's a loss of body control and they cannot be reasoned with because they're in the downstairs brain. When there's a true sensory meltdown, there's no conscious choice because the goal is safety. So I hope that makes sense. When someone is having a tantrum then, they're in the upstairs brain because they can make choices. They're looking for your response. What happens if I slip my pen on the ground? What happens if I stomp my feet, right? So a tantrum is a conscious choice. So that's up for you to kinda decide how to work with your student but you must need to know and understand these two things because that is going to help you to help your child. So part of working on executive function is that emotional and awareness of yourself and your body. We'll get to that.

So to break it up for a little bit from the neurology there, we know Phineas Gage, he is one of neuroscience's star patients. He is someone that's, gosh, I wanna say it was a few centuries ago, when they were building the railroads. Phineas Gage was a very, very nice man, he had a family. He was very functional and he was laying railroad ties and they used to do this by explosions, blowing up the mountains or whatever they had to do. But in an explosion, Phineas Gage got a piece of rebar stuck in this green area that you see, in his frontal lobe and his prefrontal cortex right here. So he got this bar, a piece of metal stuck in here and a lot of times I show children that I'm working with that older their frontal lobe because I wanna educate them on where in their brain

they're thinking. But I don't wanna use a graphic or gory picture, obviously so sometimes they draw cartoons but again, educating children that are older about their own executive function, is just good practice because they've got to advocate for themselves. At any rate, Phineas Gage got that piece of rebar stuck right around here in the frontal and prefrontal cortex and his executive function changed. He became impulsive, his personality was different, he started to make bad decisions, got sexually promiscuous, became an alcoholic. He really had an impact on executive function and his life took a turn for the worse because of all of this. So he's a beautiful, I hate to say this poor Phineas but he's a concrete example of what happened, what happens when our executive function, isn't working smoothly. So look Phineas up.

So what does the frontal lobe do then? It's where our rational thinking is so we're rational when we're thinking in that higher level brain. Future considerations. Now, here's the important thing. If you think about and I have two teenage boys but I've worked with a lot of students. Most kids are immature up until the age of their mid 20s. They're incapable at teenagers of thinking about, a lot of them are very impulsive, number one. Number two, it's hard for them to think about the future considerations of their decisions which is why they make so many mistakes and they learn from them. So it's very difficult for them to do that and I think that's why the drinking age is older and all these things ages are older because the physiological brain doesn't mature until 25 at least and of course, we know this that kids with special needs, have a little bit slower development so consider that. So 25 years of age is when around, there's nothing concrete than when this matures.

So interoception is something we need to work on in the whole scope of things from birth forward. That is our ability to manage our mood, to think about our fatigue, think about our physical comfort. That is what interoception is and I do have a book about interoception. And I gave lots of strategies to help these kids because obvious I don't wanna give you information and then have you say, "Well, what do I do?" So it's really

important though to work on this stuff as a young patient. So when these kids come to you, you need to maybe start working on. Let's use your mood, how does your engine run? Where are we right now? Where's our emotional awareness? What about taking breaks? So knowing when you're really tired is important, for executive function because we know our kids that are pushed and pushed and pushed with complicated tasks in school, they probably are exhausted by the end of the day and that's why they have these meltdowns, right? So that's critical to remember.

Metacognition warrant some extra explanation because it is something complicated. So remember, I said that it is something that you, it's kind of external, you feel like you wanna just say, this is like you looking down from the ceiling at yourself. We wanna teach our students to say, "How am I progressing?" Am I on track? Maybe I need to reflect on this task after I'm finished. How are other people doing it? How are they not doing it? Look at kids with autism, if we have social issues with kids with autism, they may not have this thing called peer reference. So you're trying a new task? How do you know if you're doing it right? You look to your peers, right? And if kids with autism as a rule aren't really good at social engagement, they might not reference their peers. So we might have to teach them how to determine if they're right. If they're doing things right. So am I on track to meet the deadline? You can start using these rubrics in your, like a rubric. So even if you're setting up a handwriting task or a fine motor task or a block building task, you can have them at the end process for just a few minutes. How did I do with this? How am I doing with this? Did I do okay? I made a lot of mistakes so start working through the processing part with these students as you go from each session. So this is not something you need to do any specific training in, you just have to build it into your current sessions.

So here's a quick game. The other thing that's very, very important for us to remember is that we learn from our mistakes. And it's important because I know a lot of kids with autism get upset when they make mistakes but we need to teach them that through

making mistakes that's how we learn. So I'm going to ask you that are listening, I'm the only one that has the microphone so you'll have to do this in your private office or room or wherever you're taking this course. But I'm going to say the word silk three times and I want you to repeat it after me each time. And then I'm going to ask you a question, okay? So ready? Silk. Silk. Silk. What do cows drink? So I'm guessing that most of you said milk because silk and milk rhyme, right? And if you said water, good for you because that's the right answer. So I asked you what cows drink. Cows don't drink milk, they drink water. Now baby cows do, I've had someone raise their hand and say, but actually a baby cow does. But most cows drink water. So you learn from that, all right? So here we go. Let's do it one more time and I'm going to ask you the same question after and the same silk, ready? Let's do the same thing again. Silk. Silk. Silk. What does a cow drink? Water, so you just made a mistake and learnt from it very, very quickly. That is a really good way for you to see how this works. So understanding with your students right then and there, helping them to figure out what they're doing is building executive function. On a subcortical level, we need to understand that there are emotions, reactions and rigidity. These are things that happen to kids with autism. They have these intense emotions, don't we all, right? But they can be more impulsive and more rigid to try to control their environment and make it comfortable for them. They also have a lack of self-reflection. So that is just a physiological part of autism and to some degree to be categorized in autism, these kids all have some of these so keep that all in mind.

Now let's talk about Theory of Mind which is the piece that I want you to understand. Theory of Mind is the ability to attribute mental states to yourself and to others. So what do I mean by that? I mean that if I'm gonna go into a room, let's say I'm invited to a party, I walk into the party and I look around the room and I assess the people. I wanna see where the people I like are, what are they doing? Is someone crying in the corner? Is someone laughing? Is there a fight that's broken out? So I kind of read the room so to speak, that is Theory of Mind in action. It really helps us then to manage our

external environment, we have to have some structure and routine to make the environment successful and we do that by looking at the environment, getting a read on it and then planning it to reduce the tasks or reduce. Let's say, you go into the library and someone's listening to music loudly. Well, you're gonna have to find a different place to sit. You don't wanna sit right next to him, if you've got a test to study for the next day. So do you see how reading the room is critical to building functional success? So in Theory of Mind and executive function we know by research that Theory of Mind deficits, are associated directly with the ability to engage in pretend play. Isn't that interesting? So if a child with autism can't do pretend play, it is assumed that they're gonna have some theory of mind deficits. So it's going to mean that these kids have problems, in beginning the activity, substituting something for another, that's where our pretend play is, right?

So we'd have a, I'm gonna do an activity with my students later where we're going to use a sticker as something else. We're going to use it as a visual, we're gonna use it as a, we're gonna build a picture around the sticker. So in other words, it's not just a sticker, it's not something I'm sticking right on the paper, we're gonna be creative with it. How about if you're pretend playing with a shovel on the playground and that shovel could be something that scoops dirt, it's the dump truck, right? We know that this is hard for the kids with autism so we know that they're having Theory of Mind deficit. Communication, difficulty putting yourself, in someone else's shoes. How about social settings? If you're not able to read the room appropriately and you go in and everyone's quiet and you're talking loudly about my Minecraft for an hour, that's inappropriate, but you may not be able to see that. That is Theory of Mind. Sarcasm, visual perspective taking that social emotional reciprocity. Those are also something that we see in kids with autism but that also affects their ability to perform functional tasks. So hopefully it's all fitting together. So what do we think about the framework, right? So we need to kinda get to this framework here because how do we then help these kids? So one of the first things I wanna talk about, is evidence-based

assessment ideas because we know that we need to get, have an assessment of this. So how do we work with the Theory of Mind? And this is again, all based on current research that I've done. Most of the time according to this fantastic study by Josman and Meyer, if you haven't read. If you're a reader like I am, Josman and Meyer, you can do a search for it. I believe I got, I did a Google Scholar, I did use my school's library but Josman and Meyer, I think it's available readily, on AJOT and on some of the major Google scholars and even probably just a Google search. But find that article and read it because it's fantastic. It gives us a really good insight as occupational therapists into how we're working with these kids. But it says the BRIEF assessment because remember they did a review of a lot of articles. The BRIEF assessment was one of the most common and effective in assessing executive function, the BRIEF.

Now one of my goals professionally is to create an executive function assessment and through someone's Capstone here at the university, I really love to do that. So if you have any ideas let me know, I'll give you my contact at the end. But we really need a comprehensive assessment, for executive function. But the ToMI-2, the Theory of Mind Inventory Two assessment, is also good for looking at Theory of Mind. I've been an occupational therapist for 22 plus years and I've never assessed Theory of Mind and I think that's really sad because I've been a pediatric therapist for 18 of those years. I've never looked at Theory of Mind, that's really sad, that's why we're seeing kids discharged, when those little fine motor and whatever needs are met, in the outpatient setting and then having them struggle throughout life. And I think as our kids with autism start to age, we're seeing huge deficits.

So as an emerging area of practice for Occupational Therapy, I really suggest some community-based work or taking these kids again and working on life skills. And through the life skills that's where we would get the ToMI, the BRIEF. There are other ones, how about an activity analysis of social skills, caregiver child interaction? We really need to get back to basics here and the occupational profile of course, is one of

the most effective ways to get information about the child's occupation in home, considering the behaviors, looking at the whole setting of the child. So these are really good things that you can do that are actually evidence-based. And that's definitely room for OTs to work on this, not just speech. As you can see hopefully from my course, one of my main goals is to help you to understand that this is our field, this is absolutely our field. And if we're not working on this with our kids, we're honestly missing the boat on a lot of functional things. So performance skills listed in that Framework III, in global and specific mental functions. So when you pull out your framework, I really want you to look through our ability to work on this and create adaptations and modifications. Because again, if we're gonna modify a task, let's say we want to work on a rubric and the students says, let's say you're working on doing an obstacle course and the student trips and falls over two of the items. Then you immediately say, "Well, you did really well on five "of the things but on two you tripped and fall. "What do you think happened?" So again, build this right into your treatment. The same thing with the handwriting. I know one of the Bev Moskowitz, does the size matters handwriting.

One of the things she encourages is the students to look at the letters they made and circle the ones that are good, self-assessing, that's critical. We also need to use Framework III terminology. Even though we're used to the same old ones, the same old things we always use but we need to think about choosing materials, gathering materials, handles, inquires. So that's asking questions, right? When we don't know, we ask questions. Sequencing, notices so notices threats in the environment, notices their body, notices their heart rate. Adjusts and accommodates. Now I bet if some of you aren't familiar with the framework or haven't even read it recently, you're probably thinking this is all speech pathology but guess what? It's not, it is our scope of practice and we need to be assessing these things. There is no formal assessment for everything but because we know the framework allows us to look at these things we need to do our activity analysis. Look through an executive function lens instead of just

looking through a handwriting or yeah, they can do it or can't do it. Really analyze the why behind them. The other thing is there's a lot of lesser known categories. Again, approaches. So approaches can mean a whole bunch of things. How do they approach the task? What's their attack method? What's their plan? How is their response? How do they time that? Regulate their body of course regulation isn't just sensory. Like we said before, it's that alertness and awareness and knowing it. Accommodates, heeds, expresses emotions so really important things there. So when we're planning, working on planning with our kids, we could look at doing things like obstacle courses. How are we gonna plan this course? We're working on balance, what do you think we could do to help work on planning skills? So again, building the student into it.

Sometimes it's helpful to give choices with students but two predetermined choices that you've had, right? So you know the two choices are, an obstacle course might be, I don't know, hula hoop and the balance beam to work on core muscle or whatever you're working on but know that they can have a choice between the two to help them build that confidence up, right? So we know that it's important to have the child involved and the family involved. The AOTA Practice Guidelines state that we have. These are really awesome guidelines and the guidelines are created based on current evidence. And there's a whole bunch of them available through the AOTA press. Now again, I don't make any money, I haven't written any of these but they are not cheap. They are through AOTA, if you're a member they're cheaper, more affordable, should we say. But they really give us evidence-based practice guidelines, for our students and we should utilize these because as a profession, it's important for us to add these things into our treatments that are based on the evidence, right? So, video modeling is an evidence-based thing that you can do. So video modeling would be really cool, when you're working on the planning and Theory of Mind. Can the student go into their room? What do they look like when they're walking into a room? And have a bunch of peers do a video, based on social skills. Or if you're working on something else that's

functional, like planning something, then have them just video them or model it for them. Let them watch it, how about YouTube? They have tons of videos there and we use them for our students too. Turn taking games are also proven to work and help these kids. That's because to take turns, they've got to stop things that they want to do and stop that impulsivity in lieu of taking a turn and waiting for someone else, right?

So peek-a-boo, these are things that typically developing kids already play that a lot of our kids don't prefer and we can always re-implement them later on in life. We can play these games at an adapted form with older kids. So peek-a-boo, copying blocks, finger plays, that's like, where is thumbkin. You kinda have to have someone's attention to play those finger games, right? So kids maybe that don't like to look at other people might have trouble with those games. So re-implement them in an age appropriate way. I'm just giving you ideas. Hokey Pokey, really good game. Simon Says, they've got to wait for the person that's calling to give them the command. They can't just do what they want. That's a really fun game. FREEZE tag is awesome, how about just talking about mutually shared experiences? So yesterday we were in the school site and one of the students was having, one of the other students just talked to the other student and having those conversations. They were talking about basic things like, some demographic information, birthdays and parents and things like that. And for them to have to wait to talk to the other person and wait their turn was so so difficult. Imaginary play can be worked on through so many different things.

We are creative as OTs, we can help these students to work on imagination even as older kids. Social and Theory of Mind skills, so how do we build these? We need to think about the pragmatic language. We know that for someone to go to the grocery store eventually they need to walk into that store. They need to talk to someone if they need help, right? What about going into the bank, going onto a bus? These are social skills where we need effective language and we need to wait our turn. We need to interact with others so how do we do that? Pictionary, Scrabble, these are all based on

evidence so it's very interesting that the games and playing that we do of course we know builds critical skills. We again, our review that you need to work on approaches, times response, regulation, heeds, accommodates, expresses emotion. Also many of them so again, I encourage you to look through that framework. So the components, how are we gonna work on these little components? Well, for metacognition, we can have them make predictions and utilize our rubric. And for those of you that haven't used a rubric or don't know what it is just do a quick Google search and a ton will pop up. I have created rubrics for pretty much everything, I've done in the clinic. Because as a professor in a college program, we utilize rubrics too for our students anyway. If you look at work evaluations for any kind of job, they evaluate your performance based on a certain rubric.

So teaching students what that is and how to look at their performance and see how they match up is critical. I talked to you about oh, I know, working memory. So this is really cool. For working memory patterns, sequences and memorization games such as Simon, are really good for that and they're evidence-based. How about reversing the roles and allowing the child to teach you. So play, let the student play therapist and have them teach you the steps of a task. That way they might understand the steps and by working memory, I don't just remember, think about holding a phone number in my head, if I wanna order a pizza, I also wanna consider if you're copying from the board. Let's say a sentence and the word University might be up there. So you're looking at the board, you have to remember the word University, keep it in the brain, hold it, to look down at the paper and then write the word university. So working memory can be remembering the main idea of a paragraph. So it's really cool because you're not just limited to working memory by memorizing a phone number. There's lots of other ways we use working memory so they've got to know what it is. Planning and time management, also very critical skills.

So building things, planning schedules. I talk about how to adapt for changes and that's critical in your school-based practice, when you're looking at doing schedules with your students, you should probably teach them how to use pencil instead of pen, post it notes, right? 'Cause everything changes in life and we've got to roll with it. And I wanna conclude with this and then if you have any questions, go ahead and enter them in the chat box so that I have five or so minutes to answer them. But for executive function, we wanna talk about, again, how it affects these kids with autism. We wanna just make sure we understand that it is a huge effect on our students just because by definition, autism causes lack of executive function. And remember that when you're telling parents about what this is you're doing, you need to say and understand yourself that we need to go back and see, at what age does planning develop, right?

So look at that. Look at your developmental milestones, when you're considering executive function because knowing what happens in what order is important. Because just like any scaffolding, if we miss a foundational skill, we can't build upon it and we may compensate throughout this, right? We may have compensation but we've got to go back and reteach the skill that we're missing and that's where executive function helps. There's so much more to talk about. I know we only have an hour today but there's a lot and just knowing what to do and what the word really means is important because we're ahead of the game now, right? We already saw that the research shows that there's 30 different constructs, for defining this thing so just form a definition for it. That would be helpful and then use that definition in your practice. So we know the play is affected. So play is affected by Theory of Mind and executive function so just by being occupational therapists, we are already poised and ready to work on this. The occupational profile and considering those lesser known areas is critical. And older children, now I know we discharged, I've said this three times now, we discharge kids so often early and when the parent or the doctor sends them back to OT, we don't know what the heck to do with these kids. But we really should re-pick them up and then talk to them about how does it look.

So maybe doing some things like setting up a grocery list, a mock store, things writing checkbooks, study skills, how are you going to organize your calendar? And if you're in the school system, you're really ready for this now because you've got the planner and you've got, how do you do this? Let's say they've got a big assignment, maybe a long paper due in a week or two weeks, how do they start it? Maybe they don't even start it 'cause they're so overwhelmed. That's when we're gonna say, "Hey, let's write a bullet point list of the plan, right?" So just like you do when you're starting something hard, when you don't know where to start, you want to talk about making a little steps of the plan. So that is the main takeaways from today. I am really, really glad that you're here and I've love teaching about executive function.

Again, we need to understand that this is an introductory course so we're talking about this so that you can understand the basic meaning of it. I wanted to just review quickly also about interoception. Here's my contact information. I see a few of you have entered in there. My website is www.pocketOT.com. And I have Facebook, Instagram and Pinterest boards, again, all free. There are some paid things on my site but the blog has free information. Interoception, I just wanna cover it a little bit more because it's so important. Remember that understanding your body and things such as toileting, knowing when you have to toilet. Kind of knowing when you're hungry. A lot of our kids with autism don't understand or feel toileting urges which is why so many toilet train late. That is interoception. Interoception is understanding your own emotions, hunger and thirst. A lot of these kids keep eating and eating and eating and don't know when they're full. That's interoception, so that's another sensory that's kind of looked at as the eighth sense. So we have our proprioception, vestibular, et Cetera but then interoception is just understanding our body. I just wanted to clarify that. So handouts, I'm guess I'm ready for questions Fawn.

- [Fawn] Thanks, Cara. Let's take a look here. Do you have handouts that you use with kids at various ages to teach about executive function?

- [Cara] So you create your own, I don't have specifically ones for the blog. I'm sure someday I'll create them and that's what I'm working on for the student capstones. And one of the reasons I switched, into the academic environment because we really have a lot to work on. So I don't specifically have handouts but if you look on a site called "Understood", I don't know if it's .com or .org. "Understood" is something that has really good resources and gosh, learning disabilities, if you Google that they have a lot of resources also but there's nothing specific I have. No, it's dot org, I just looked it up. It is understood.org.

- [Fawn] Correct, okay, the next question is, do you have, this is about the printable handouts again but this one is asking about classroom tips to help teachers assist students to get to the upstairs brain from the downstairs.

- [Cara] Well, that's, you could look up, I encourage you to look up, you have to understand it yourself. And then I would look up Danny Siegel, the work of, its Dan Siegel and you'll find his name on the handouts but he has some really awesome tips and handouts through his site. So instead of recreating the wheel, I just use his YouTube videos and make, just encourage teachers to use his work at. Or at least I would teach them through Dan Siegel's work.

- [Fawn] Great, let's see, are there any tests OTs can utilize to evaluate executive functioning skills, in school-age students? .

- [Cara] Standardized testing.

- [Fawn] Other than the BRIEF is what she's asking.

- [Cara] Oh, other than the BRIEF. Well, you'll have to go to, that's a really, really good question and honestly, there's no really great, standardized assessment other than the BRIEF, for executive function. You can you look up, I can't think of a site off my head. But look up the article and the article, if you look on my reference list, the article will tell you the other ones that are utilized across the world for executive function. The problem is they're not really great assessments, for executive function and school districts don't wanna pay for them.

- [Fawn] The Dan Siegel website is Dr. D-R Dan Siegel, S-I-E-G-E-L.com for those looking that up. Lemme look at the next question here. Would you share some executive function based IEP goals?

- [Cara] Sure, well, so use your components, when you're making the executive function goals. So you might have a goal for planning, for organizing, you might have a goal for evaluating performance after. So the child may complete a task and then look at the, perform how they did after utilizing a rubric. I would definitely consider goals for rubrics because they're gonna be using them for the rest of their school. And that would be a good interdisciplinary goal 'cause I know we're not writing specific OT goals, for IEP sometimes that everyone would help them to utilize the rubric. Another thing is self-regulation. Of course, that's not necessarily a sensory goal, you're regulating your body for functional performance. So you could add a regulation goal also. And appropriate response social skills goal, those would all fit under executive function.

- [Fawn] Another question is asking, how is your engine running program? Do you know if that's a free resource or do you have to pay for it?

- [Cara] The resource of How Does Your Engine Run? There's a lot of free things online but you can buy the program also. But if you look it up online, there's a ton of free things. Pinterest has a ton of stuff on it but the program itself is a paid program. It's something you purchase.

- [Fawn] Okay, we have one last question coming in and then we can wrap up. Can you explain the Alert Program that you discussed?

- [Cara] Sure, so the Alert Program is another thing that's really, oh my gosh, it's all over the place. And if you go do a Google search for Alert Program, a ton of stuff will come up. But the Alert Program is another company that is AOTA approved provider. They do continue education, they have a lot of free resources but they also have classes that you can take to become certified or not certified but in continuing education so you can more efficiently use the Alert Program. But the program again is about helping with focus, attention. There are two people that did them, they're Mary Sue Williams and Sherry Shellenberger. They're both occupational therapists from New Mexico. The program is just helping children and that is the How Does Your Engine Run Program as the Alert Program. It is a just a book that you can purchase but there's so many free resources, not only on their website which is alertprogram.com but on Pinterest and on Instagram, just a ton of free resources. Okay, so that's it. So thank you all for attending, I'm really glad you came and there's my contact information. Fawn I'll let you wrap up and I appreciate everyone that is attending today, thank you.

- [Fawn] Thank you so much, Cara. I hope everyone enjoyed today's presentation. Cara has many other programs in our library so check those out. Hope everyone has a great rest of the day. Join us again on Continued and occupationaltherapy.com. Thanks everyone.