Motor Interventions in Early Intervention: Part 2

Recorded March 20, 2020

Presenter: Jessica McMurdie, OTR/L

OccupationalTherapy.com Course #4670

- [Fawn] Today's course is Motor Interventions in Early Intervention: Part Two, an Introduction to the Development of Post-Walking Skills for Infants and Toddlers. Our presenter today is Jessica McMurdie. She's the owner and clinical director of Stepping Stones Therapy Network, a successful pediatric OT practice in the Seattle area. She also shares her pediatric expertise on her popular blog, Play it Forward Therapy. Jessica has two decades of experience working with children and their families in hospital, school, birth to three in outpatient settings. She holds dual degrees in Spanish and Occupational Therapy from the University of Washington and specialty certification in Sensory Integration from the University of Southern California. She's a nationally award winning small business owner recognized as an emerging leader by the American Occupational Therapy Association and the US Small Business Administration. She is a contributing author to the best selling book, "The OT Manager." For more pediatric activities and education to inspire practice, visit her website, www.playitforwardtherapy.net. Welcome back, Jessica.

- [Jessica] Thank you, Fawn. I'm super excited to be here and thanks for joining us today. I'm going to jump right in and talk about the learning outcomes and what you can expect from this presentation. First we're gonna identify the four primitive reflex patterns that impact the acquisition of gross motor milestones. Secondly, we're gonna identify the developmental progression and the sequence of posts-walking gross motor skills. And finally, we're going to identify several therapeutic activities to support the development of balance, strength and the coordination of young children. Again, I'm excited to be here today, and since my last presentation, I have had the chance to connect with many of you from all over the country and some from all over the world, and I just wanted to thank you for joining me again. And if you're new to working in early intervention, I really hope that this course will get you excited about early intervention, and if you're an experienced therapist and if you've been working in EI for a while, I hope that this course will be a good refresher course for you as well.

I wanted to mention, I have a bonus handout for you. It's a gross motor and checklist for toddlers, and I hope that this cheat sheet will really help you in terms of giving you an overview of the key mobility skills for toddlers and preschoolers. I also hope it'll really enhance your clinical observations by providing you with a really sequential step by step outline, as well as helping you prioritize what are the most important criteria for mastering milestones. It will also assist you with writing really specific, measurable and functional goals, and I really hope that it'll come in handy and you can really use it when you're explaining to parents and caregivers how to provide that just right challenge for their child. So in order to access the bonus handout, you're going to go to playitforwardtherapy.net/gmchecklist2. The checklist is sent via email with a link to you to download the PDF. So this will help you when we get to the gross motor milestones and it'll help you, walk you through all the details and you'll be able to take it with you in your clinical practice as well.

I wanted to touch on the pediatric intervention framework and just keep this in your mind as you're thinking about therapy activities for kids and how you're setting things up to really ask yourself, what is it that I'm targeting, what is the purpose of this activity, what are the parents goals, what are the child's goals and really think about positioning and how you can position the child for ideal movement patterns, as well as practice ideas, what is the practice of the skill gonna look like? Remember that practice makes permanent, so it's better to have quality movement with a movement done and performed well than quantity with something not practiced correctly. And also, be creative in your thinking with play ideas and really try to integrate what's motivating to the child, and also think about progress, how are you going to be tracking progress? So again, the pediatric intervention framework, I really want it to be able to help people from feeling overwhelmed with how to approach a clinical problem, to really feeling more confident and to give you a greater clarity and direction in your clinical reasoning skills.

So the first question I have for you is how do primitive reflex patterns impact a child's acquisition of gross motor skills? So this is a really important question that I hope to answer today. First of all, let's define primitive reflexes. They're located in the upper brainstem and they're the primary drivers of basic motor skills. They're innate, unconscious and involuntary responses to specific stimuli. They're the earliest pathways towards more refined movements, and they enable the infant to suck, blink, grasp, roll and prepare for crawling. So I like to use the example when I'm explaining to parents, have you ever been to a doctor's checkup and you're seated at the edge of the table with your legs hanging down and they bring out the reflex mallet and they tap your knee with a reflex hammer? And so the purpose of that is to generally check the integrity and the functioning of the central nervous system, and it's an action that you can't necessarily control. It happens automatically. So this is an example. Another example is blinking. It just happens naturally and automatically. In the early infancy and early childhood, primitive reflexes are predominant, and they're gradually inhibited as postural reflexes develop as the child goes through new movement patterns, as well as when higher centers of the brain start taking over. Primitive reflexes are special reflexes which emerge and develop during life in the womb. They're present at birth, and they're active for the first six months of postnatal life.

So this is a quote from Sally Goddard Blythe. I really enjoy reading and researching about different aspects of occupational therapy related topics amongst other OT authors, but also authors outside of our profession, and Sally Goddard Blythe is one of the leading researchers in this area. Let's talk about reflex inhibition. So reflex inhibition means when higher centers of the brain or increased cortical control, they inhibit primitive reflexes, and these are slowly switched off in the brainstem as the baby develops, and some of the reflexes, they might disappear, and then they might reappear at certain stages of the infant's development. And primitive reflexes, they might also be reawakened. So if there is an accident or a brain injury to the higher centers of the brain, you will see these reflex patterns come back. So one example is,

it's, you could see it in a geriatric patient, for example, who has a stooped or a shuffling posture. Reflexes are also seen coming back in patients who've experienced traumatic brain injury. So for example, when I worked at Children's on the traumatic brain injury unit, it was inpatient and the children had suffered acute traumatic brain injuries, and I remember some of the movements that we would normally think as automatic were very difficult, such as a child being able to remain seated in a chair or being able to sit down into a chair because a reflex was kicking in and preventing their body from doing that. I also remember how some kids, it was really difficult for them to control their fine motor movements when they're seated at the table, because anytime their head changed direction, their arms and their hands would follow as a unit along with their head, which made it really difficult to control their hands apart from their head movements, and this would suggest a reawakened STNR or an ATNR, which we'll talk about later.

Reflex integration. It occurs due to a combination of the central nervous system becoming more mature, along with physical interactions with the environment. And as the baby progresses through their motor skill development, all of these movements are helping the baby to map new motor pathways. And reflex patterns, again, they're followed by more mature patterns, which we call postural reflexes, and this is what we mean when we're talking about when higher level cortical control develops and motor control becomes more refined, so the baby has an intention of where it wants to go, they have a plan of what they want to do and that's higher levels of the brain taking over, versus a reflexive pattern and a response to movement from the brainstem. The integration of these primitive reflexes, it follows a very specific timeline in typical development. So how and when the reflex is integrated, it influences the timing of the motor skill acquisition. So if a reflex isn't integrated, it can interfere with typical patterns of movement, and it can result in neuro developmental delays. In the research that I've done, I have read that many recent theorists, they like to think of development as a cascade. So a cascade effect with certain movement patterns overlapping and

integrating with one another, and that affects the timing of motor skills. This is in contrast to a theory of reflex integration and reflexes having strict start and stop timelines along the developmental continuum. So think of it as a cascade or a melding of reflexes coming and going and being integrated into and out of the new movement patterns as the baby develops. One example of reflex non-integration is bottom scooting instead of crawling, and a side note, there is an awesome documentary called "Babies," which is new on Netflix, and after you take this course, I encourage you to watch it with reflections in mind and see what you notice.

Okay, back to the presentation. If primitive reflexes are not fully integrated, they're likely to interfere with typical patterns of development and contribute to fine and gross motor delays. There are different levels of severity when it comes to the level of retention of a reflex, and when you're testing for the presence of reflexes, there are different levels of impairment. So it could be mild, moderate or severe, which in turn impacts the level of the child's function or their quality of movement. So think of it as having a routine reflex is like when you go to the store and you pick a shopping cart, and the one that you pick has a wheel out of alignment. So you can still push the shopping cart, but it takes much more effort, and it's more difficult to steer or to course correct with that shopping cart. So similarly, if a child has some movement reflexes that are retained, they have to work against those to do what they want to do. So they're often still able to achieve the movement, it just makes it harder and it takes more effort. And on a side note, as adults, all of us, many of us still are retaining some reflexes. So again, that's where it comes down to the level of impairment.

You can still function well with mild retention of reflexes. So for example, I have definitely a strong startle reflex that is still very much impacting me sometimes. And also, I think I have a retained ATNR, which we will talk about as well, so you can think about yourself as you study these movement patterns. And just keep that perspective in mind that some of us retain them and it affects function, but it doesn't always impact

our quality of life. Some risk factors for retention of primitive reflex are medical and birth history, if a child has had a traumatic birth or complications, neurological problems, prolonged hospitalizations, so those also limit opportunities for gross motor practice. Insufficient tummy time is a big one, skipped developmental milestones, having decreased strength and endurance and hypotonia.

Primitive reflexes and gross motor skills. So we are going to talk about the four big ones, because our topic today is gross motor skills. We're going to talk about the moro reflex, the tonic labyrinthine reflex or the TLR, the symmetrical tonic neck reflex, the STNR, the asymmetrical tonic neck reflex, which is the ATNR. Let's start with a moro reflex. So, this is also known as the startle reflex, and what precedes the moro reflex in the womb is called the fear paralysis reflex. This is active in the womb and it precedes the moro reflex in the infant, and the moral reflex, it's suggested that it assists the baby in taking its first breath after birth, and it's triggered by sudden unexpected events, such as the loss of head support. And what this looks like is the arms and legs extend, the baby rapidly takes a breath and freezes for a second, and then it cries out as the arms and legs return to the body. So let's watch a video example of a newborn moro reflex. Next is the startle reflex, which is active by four months, and this is triggered by a sudden or unexpected event in which the baby will either ignore or will respond. So let's watch a video of an example of a startle reflex in an infant.

Let's talk about signs of a retained moro reflex. So, kids that retain a moro reflex, you're going to see hypersensitivity and overreactivity to sudden stimuli. You're going to see motion sickness. They often have poor balance and coordination and visual attentions and distractibility. A strong dislike of sudden or unexpected changes, so examples of bright lights or loud noises and a poor adaptability and dislike of change, and this is because if you're easily startled, what kicks in is your fight or flight mechanism and that is stressful and that causes stress, and if you know that you're predisposed to being stressed, you might try to control everything that you can, and

changes are hard for you. So this is something to think about when you're thinking about behavior of children and why that might be.

Let's move on to the next reflex, the TLR, also known as the tonic labyrinthine reflex, and this is baby's first response to gravity, and this reflex is triggered with changes in head position forward or backwards, and there are two positions that we like to look at. The first is inflexion, so when the head is flexed above the level of the spine, the body moves into flexion or fetal position. And the second one is extension, so when the head is not supported and it extends below the level of the spine, the arms and legs move into extension. Here is an example of a newborn. The first picture is extension, and the second picture is flexion. And when we think about the TLR, one good way to think about it is which movement plane do the movement patterns happen in? And in this case, the coronal plane. So, the front and the back sides of the body. And it really is important for the development of postural control between balance, between the front of your body and the back of your body. Inhibition for the TLR, it typically starts at six weeks of age as head control develops, and there are multiple phases of integration throughout the developmental milestones, but it should be fully integrated by three and a half years old.

Now let's watch a video of a baby who's still working on integrating the TLR as she's learning to maintain her balance. So she has pretty good postural control, but we're still working on it. And as she gets more confident and starts sitting more and practicing more, you're gonna see that reflex's influence less and less. So, the tonic labyrinthine reflex integration involves head control, so it's a major precursor to the development of head control, and it affects muscle tone. And like we mentioned, it also impacts the baby's ability to balance between the front and the back sides of their body and the postural control required for sitting up and standing. So basically, integration of the TLR is essential for upright balance. And babies really need lots of opportunities for active play in the prone and supine positions, so this is why it's so

important. So tummy time, you know, the push up on arms and lifting the head, it strengthens their neck and postural muscles. And then when babies are playing on their backs in supine flexion and bringing their hands to midline with a toy or a foot play, this is all helping to integrate the TLR. So when the TLR is not integrated, these are some of the signs that we see. Poor balance, postural problems, toe walking after the age of three and a half, muscle tone, ocular motor control problems, easily motion sick and possible vertigo.

Next, we're going to talk about the tonic neck reflexes. So tonic neck reflexes are associated with the proprioceptors in the neck muscles and the position of the baby's head and neck. The baby's head is in symmetrical alignment with the neck and tonic neck reflexes influence the muscle tone of the neck, trunk and the limbs. So let's talk about the two neck reflexes. The first is called the symmetrical tonic neck reflex or the STNR, and the second is asymmetrical tonic neck reflex, or the ATNR. So let's talk about the STNR first. It's a precursor to maintaining an upright stance, and the baby's head's symmetrical alignment with the neck. And this reflex, it assists the baby moving off the floor into a quadruped position to prepare for crawling. So it's a precursor to crawling, and it helps the baby work against gravity. So we think about this in terms of movement planes. The STNR, it functions by dividing the upper and lower half of the body's movements within the transverse plane. And here are some pictures of the STNR. So you can see in picture one, the head goes up, the arms straighten, the legs bend and bottom sits on the ankles. And the second picture, when the head goes down, the arms bend and the legs straighten. So the STNR, it causes the upper and lower sections of the body to perform opposite movements. So you can think of this as baby yoga poses to help you remember what the positions look like. And I'm going to let you see this in action, so we're going to watch a video of active STNR inflection, and you'll be able to see how it's related to crawling, so I want you to think about how this flexion pattern helps the baby get off the ground into a quadruped position. Excuse me, how this extension pattern, so the first one.

So you can see, the baby is doing some rocking movements back and forth in quadruped, and this really helps to balance and strengthen her upper and lower halves of her body, and it helps her to operate more efficiently, and it also gives her more postural stability. And babies will often start to move backwards before being able to creep forwards, and this is due to the STNR. And it's also super important to have weight bearing on their hands and knees just for the development of future motor milestones and strength. And it also impacts eye hand coordination during creeping, because when their head and their neck is in this alignment, looking at things as they're crawling on the floor, this is a really similar visual distance for future reading and writing, so this is how these primitive reflexes tie in with future motor movements and functional activities. Okay, let's go back to our slideshow.

So some signs of a retained STNR. Crawling is absolutely critical, and the retention of STNR, it interrupts crawling, so it helps launch the baby to be able to get into quadruped but if it persists, it interrupts crawling. Crawling requires both sides of the brain communicating with each other, and this helps to develop the myelination across the corpus callosum of the brain. And lack of crawling is highly associated with learning disabilities, and those will come up later in the child's future, we will often see it coming up later. And it's an interesting question to go back in terms of a child's medical history or developmental timeline and see how they did with crawling and if they crawled or if they skipped it. So something just to keep in the back of your mind. It'll make a little bit more sense as we look at some other functional signs of a retained STNR that you might see in older children. First of all, the baby might move in variations of crawling like bunny hopping, scooting, the bottom shuffle or dragging one leg, and it also affects the convergence and divergence of the eyes, kind of like we had talked about the visual distance from eyes to hand, which is important for reading and writing as the child gets older, low muscle tone, w-sitting, poor posture, often in a slouched position, sacral sitting and fixing patterns. Everything, again, takes extra

effort for a child with a retained STNR, and these also are the kids that you might see in the classroom who have trouble sitting still, and it's not because they are hyperactive necessarily, it's because they're having trouble maintaining postural stability, and you'll see fixing patterns like their little legs are wrapped around the desk, they're not able to sit still. So these are some indications that there might be some possible retention of an STNR. Again, integration of the STNR is rocking back and forth. This is what really helps to integrate this reflex, and being in a tabletop position with both arms and legs in extension at the same time with the head facing forward. So we are going to watch a video clip of what that looks like. And now back to our slideshow.

So that was the first of the tonic neck reflexes. We're going to move on to the second, which is the asymmetrical tonic neck reflex, or the ATNR. This is when the baby's head is in asymmetrical alignment with the neck. They're looking to one side, and this is a precursor to eye hand coordination. Here's a picture of another baby in ATNR fencer pose or archer pose. You notice the extensor pattern on the face side with a flexion pattern on the skull side. So whenever the baby turns its head to the side, the arm extends on the face side and the other arm flexes on the skull side. In terms of the ATNR, it's significant because it assists the baby moving through the birth canal. It also allows the newborn to turn the head to one side for breathing. It's a very important early pathway for the development of eye hand coordination. And inhibition typically starts from six months. This reflex will reappear and appear for short periods of time until the balance required for each particular gross motor milestone is mastered. So when a child's balance is challenged, you might see that arm go out when the head turns to that side. So that's an example of when it might come and go. So if you think about it in terms of movement plane, the ATNR divides movements within the sagittal plane, and this one sided movement, it really helps break the body up from whole body movement patterns that the baby has primarily been moving within up until this point. So the division of the right and left sides of the body, it establishes homolateral movements and the development of laterality, so this is why it's important. Some signs

of a retained ATNR include a lack of midline crossing. Poor lateralization of both sides of the body, so slow to develop hand dominance or preferred hand. Poor handwriting pencil grasp and fixing postures. So, these are the children that are sitting at their desk, and they lean their head on their hand as they're writing. They cannot seem to keep an upright posture, and they're also trying to compensate by using heavy pencil pressure and trying to stabilize themselves, because whenever their head turns, that hand will also turn. And it's also common to see a low score on post-rotary nystagmus. So you think of these as eye movements, horizontal eye movements that are crossing midline. So when we're checking a PRN for a child, these are reflexive eye movements. So if the eyes are not moving well reflexively, then they will not move well volitionally, or on purpose. So if the eyes aren't moving well reflexively, they're not moving well volitionally.

And what does this have to do with function? Well, let's talk about that. It's important for eye hand coordination. If your eyes aren't moving reflexively, ocular motor control necessary for copying from the board or copying or drawing and writing might be affected. One way that's easy to incorporate to help integrate with the little ones is sitting and crossing midline or standing. So providing, again, positioning of the toys and number of duckies, that's our repetitions and practice, so that repetition to help break up the typical movement patterns of that reflex, you want to go in the opposite direction that the tendency is going towards. Again, the question I'm asking you guys is why is it important to understand primitive reflex in relation to gross motor skills? So what is the significance? Why do we need to know about this? The reason is because of balance. So the balance mechanism, it's reliant upon these major vestibular reflexes, the moro, which again, is impacted by movement of the head and multisensory input, the TLR, tonic labyrinthine reflex, head movements and the STNR and the ATNR, the neck reflexes. So all of these reflexes have a direct effect on muscle tone and balance, which is essential for foundations for gross motor skill development.

The balance mechanism. So the balance mechanism involves several sensory systems working together: the vestibular system, the proprioceptive system, the visual system and the tactile system. You think about vestibular input and all that you have going on, you have the otoliths and the saccule, and you have different types of anatomy tracking and measuring and responding to up and down movements or back and forth movements or rotary movements. So all of this input is being processed by the vestibular system as well as the proprioceptive system, so your body awareness and knowing where you are in space and your visual system, how much you rely upon visual system and the tactile system for being able to feel exactly where you are and to give you a sense of your environment. So you think about an example of walking forward on a line. All of these systems are working together, might particularly be vision, but if you're walking backward on a line, walking backward on a line, you will have less visual input walking backwards, so your vestibular system and your proprioceptive system and your tactile system, maybe feeling the floor, are going to be, you're going to be more dependent on those. Now we're going to take a look at this video.

This is a video of baby M, and as you're watching it, I want you to think about what types of strategies she's using. You can observe lots of different types of ankle and foot and hip strategies in order to maintain her balance for weight shifting.

Let's talk about the developmental progression of gross motor milestones. So I've broken it up into six phases. So number one, advanced walking skills, two is balance, three climbing skills, four jumping, five ball skills and six riding a tricycle. So the focus isn't going to be on the exact ages, but rather the progression of gross motor skills from post-walking to bicycle riding. And the handout, the bonus handout that I have for you, that also includes more timeframes in terms of expected acquisition and ages. Again, if you need to access it, you go to playitforwardtherapy.net/gmchecklist2. And it really is going to focus on the major milestones and all the transitional movements that

occur between the ages of one and five. And once you go to that site, then it'll be sent to you via email with the link to download. Let's talk about advanced walking skills. So this means walking on uneven surfaces such as grass and bark and different types of pavements, up and down incline surfaces, so ramps, variable height curbs, being able to step on and off, fast walking and running. Let's watch a video for some examples of treatment ideas for advanced walking skills.

- [Woman] We don't have time to do tire today. We could 50 on wall.

- [Jessica] I like to use little red dots to signify kids to stop and I use little green dots to signify go, and this seems to help when we're practicing gross motor skills, learning to stop and go. Next we're going to talk about balance. Navigating on uneven surfaces, so balance for single leg stance activities such as getting on and off ride toys, kicking a ball, dynamic balance and postural control, balance beam skills and static and dynamic balance. So let's watch some examples on a video of treatment ideas to improve balance. And now back to our slides. We're going to talk about phase three, which is climbing skills. On and off low surfaces, climbing stairs and next would come climbing vertical ladders and then other play equipment. So let's check out the video for some more ideas to incorporate for climbing.

- No. No. No. This.

- No, I'm scared. I need help getting down.

- [Woman] Are you stuck?

- I want help, get me.

- [Woman] Okay, I'll help you.

- [Jessica] Okay, and let's go back to our slideshow. So those were some examples of climbing, and climbing skills and activities are a great opportunity for strengthening and they're also really important for safety too. So if you've noticed, kids being able to climb up but also, just as importantly, is climbing down and making sure that you teach them safe ways to climb down. The other thing that's a really significant milestone is stair climbing and really knowing how to grade stair success. The first step is typically kids will mark time, so they'll hold on to something, some support, and they'll lead with one leg and then they'll bring the other leg up and they'll lead with the same leg. And that comes before alternating feet, and typically in terms of leg and foot dominance, they're going to lead with a more dominant foot and then coming down the stairs, they'll lead with their weaker or less dominant foot. So looking at observations of stairs, kind of take a look and see, in terms of foot and leg dominance or if there's any strength discrepancies. Those might come out when you take a look at stair climbing.

Let's go on to phase four, so phase four is jumping. So being able to jump on bouncy surfaces, being able to jump on a trampoline with your feet off the floor, forward, backwards, side to side, and then off a step, two, four and eight inches. So let's break down the phases of jumping and get some treatment ideas and activities by watching a video. So we have some pre-jumping skills, up on tiptoes, knees are bending, we're not clearing the floor, again safety, being able to climb off backwards. If you're working on helping kids use less support, you can give them a stuffed animal to hold. And here this child, their feet are actually clearing the surface. Here's an idea for visual tracking, as well as jumping, leg strengthening of the calves, standing on tiptoes by suspending a balloon with some, I think I have some pom poms and some little tiny bells. And jumping on and over couch cushions is easy and fun to do at home. We have ball hoppers outside, or even inside to burn off extra energy, and really making activities fun, so making it social, playing Ring Around the Rosie, jumping with a friend, playing with sidewalk chalk, jumping in puddles. So toddlers love cause and effect of jumping.

And again, a different type of surface, so an uneven sandy surface, the push off is going to be much more difficult, require more strength. And again, lower squat, pushing off, jumping off into the pool. And painters tape is a great way to practice jumping. You can do long jumps, you can do short jumps, you can do jump roping, and again, we hear start and stop and take your jumping outside. So she's getting the hang of it. And. Let's go back to our slides.

Phase five is ball skills, so let's talk about toddler skills when it comes to playing with balls. We're going to take a look at how they kick, throwing, catching and hitting, and let's take a look for some more ideas. Let's start our video. Using a balloon is helpful because it moves a lot slower, it's round, it's soft, it doesn't hurt. The next step up would be using a beach ball, so try not to start with a playground ball right away. You definitely want to build on success. And here we have a two pound weighted ball and I just filled up some water bottles with colored glitter, and those make really fun bowling pins. And if I wanted to grade this activity and I had direction falling, I would probably have her pick up the ball, but my main focus is the throwing, so I have my assistant with the setup. And again, grading the activity using a bigger ball to make it easier and successful. And this little girl in this video is exactly two years old. Again, we have more balloon activities. I have my pool noodle lightsabers, and we are hitting a suspended balloon to work on dynamic balance as we're standing on the bosu ball, balance reactions using lots of ankle, hip and knee strategies. And kicking a ball on a regular surface. Walking while kicking a ball would come next. It's amazing how many things you can do with the ball to keep kiddos busy. And at home, using the laundry basket to shoot baskets. You could throw socks in there, you can throw stuffed animals. So that also works on eye hand coordination and helps with ball skills. Let's go back to our slides.

The next phase is ride on toys. So when it comes to balance, you think what is required for ride on toys? So you're going to need some one leg stance and some static and

dynamic balance and lots of ability to be able to weight shift. It depends on if the equipment is stationary or if it's moving. So the easiest way to start is with these little inflatable ball bouncers like this little horse here, and then you go to wheeled ride on toys, and then playgrounds have those springs underneath, so that's adding lots of opportunities for dynamic balance and postural control as a child is rocking back and forth. And then trike riding would be next, and nowadays they have so many different types of trikes for training. I really like the trikes with handles and push bars so the child can really focus on the feet position and the pedaling and it starts them off with success. So, if it's too hard, they don't give up right away because you're there to help them a little bit. It also takes out the component of steering, which is good if you're just focusing on lower extremity strengthening. And you also want to look for a sturdy trike that is not going to fall over, as well as if you notice here on this seat, here it has a little bit of an edge or a back, and so when the child is pushing on the pedals their bottom won't slide back, so I prefer these types of trikes with a back support, or even a back support that goes up higher, like this one is also helpful for trike training.

Now let's talk about tracking goal progress. So we have all these great activities, but when it comes down to it, we really need to be able to track goals and measure progress. So some different components that you can include are time, so how long is the child able to sustain the movement, as well as the number of repetitions, as well as their level of support or assistance. So this could be more than just min assist, mod assist, max assist, but being specific. Is it one hand support, is it two hand support, is it support from a railing or a banister? And then the next quantifier would be environment. So we talked about different types of surfaces for the same skill. So, walking on a hardwood floor is different than walking in sand out in the community. So think about a parent's goals too. Maybe they want to be able to have their child join them on an outing and being able to have best mobility when they're out and about in the community, navigating curbs or maybe they're on a trail and having their child be confident and being able to walk and balance in different environments. And again, we

also want to look at the quality of the movement. So going back to how we talked about retention of reflexes. A child can do the movement or they can execute the movement, but the quality may be lacking, so it might appear uncoordinated or awkward or effortful or maybe they tend to avoid these types of gross motor activities. So if that's the case and you see a child really struggling, going back to our developmental knowledge, you want to go back in time and make sure that the prior milestone is mastered before you move on. So again, you might need to take a step back and go work on the preceding milestones, and those really affect the quality of movement and the coordination for future milestones, and I think this is important to explain to the parents as well. If they have an end goal in mind, why it's important to really develop a good foundation. And the handout that I have given you would really help lay that out and explain that. And also, we also want kids to be able to generalize what they're doing in therapy to home and into the community. So again, really asking parents what is the most important, are there any areas of frustration, does your child get upset at certain times because they're limited by their movement? So really find out what is the most important to them and how you can help them when they're out and about in their community and when they're at home.

So this brings us to the end of the presentation. So, so far we've reviewed the four primary primitive reflex patterns impacting the acquisition of gross motor milestones. We reviewed clinical observations and potential functional limitations of retained reflexes. We identified typical development progression of gross motor skills, and we also reviewed some treatment ideas, to be able to support the development of a child's balance, strength and coordination. If you have any questions, I would be happy to connect with you. I'd love to keep the clinical conversations going. From the two previous courses, I've had the chance to connect via email with so many of you and I would really love to hear from you if you have any specific questions about what we talked about today. And I just wanted to say thanks for inspiring me to create this course and for taking the time to join me today. And I really wish you continued

success as you pay it forward with the kids and the families that you work with by sharing your OT talents, and again, I wish you all the best in your practice, and you can connect with me via email. My email is jessica@playitforwardtherapy.net. You can also explore more pediatric OT ideas. We work with a lot of kids beyond early intervention at my practice. And also, feel free to listen in on the Play it Forward Therapy Podcast, where we're going to talk about all things related to pediatric occupational therapy. Or you can also connect with me on social media. The last side are the references, so if you want to read more about reflexes, these are some great resources by Blomberg, Oden, Goddard-Blythe, some great resources if you're interested in learning more. So thank you for your time today, and enjoy the rest of your day.

- [Fawn] Thank you, Jessica for a great talk today. I hope everyone has a great rest of the day. Join us again on Continued and occupationaltherapy.com. Thanks everyone!