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Early Developmental Milestones

Introduction

Early developmental milestones are an essential part of occupational therapy treatment for a pediatric population. They help therapists write goals and structure treatment sessions, but they are also a good guideline for parents to follow when tracking their child's development. All therapists should be abreast of these new milestones in order to effectively compare pediatric patients to their peers and treat them accordingly. While this information is important to therapists, it should be used to connect children with services such as early intervention when their development is behind that of their peers. Therapists should be aware of gross motor, fine motor, visual-motor, social-emotional, and language development in order to address the full range of a child's needs. By having a thorough understanding of these new milestones, occupational therapists can better educate parents and teachers, provide documentation that justifies their services, and accurately relay information to IEP teams.

Section 1: Background [1]

In February 2022, the Centers for Disease Control (CDC) and American Academy of Pediatrics (AAP) collaborated to revise the existing set of developmental milestones. This data was initially released in 2004 and has not been updated since then. The CDC and AAP noted that their goal was to provide clearer information so parents and caregivers could more easily recognize signs and symptoms of communication disorders such as autism. This way, if a child begins displaying certain behaviors, parents can report back to healthcare providers based on the milestones they are aware of. Similarly, this set of guidelines can help therapists determine the root of the problem when children present with such behaviors in clinical settings.

Due to the timing of these revisions, many providers (and parents) assumed changes were made to factor in the impact COVID-19 has had on child development. However, the new guidelines have not made any mention of this. Up until now, the milestones reflected the performance of 50% of children. This means half of children were expected to meet the milestones at each age. Now that the revisions have been made, the current set of milestones are indicative of what 75% of children are displaying. These organizations also aimed to improve clarity and cut down on confusion by removing certain verbiage (such as "may," "can," or "might begin") from milestones and eliminating any duplicates.

The adjusted percentile guidelines are the most talked-about revisions, but the CDC and AAP made other changes. There are also several new social and emotional milestones, including catching the attention of others and smiling without prompting. The addition of milestones in this category was likely to further emphasize early signs of autism and other behavioral concerns. Some milestones were also taken away, the most notable being crawling. Providers came to this decision because many children skip crawling and instead go right from pushing up on their arms to supported walking to walking. The milestone for walking was adjusted from 12 months to 18 months. Language is the area that got updated the most. One of the biggest revisions was changing the talking milestone from 12 months to 15 months.

Professionals also added checklists for 15-month-olds and 30-month-olds, which means there is data to correspond with every wellness check from 2 months up to 5 years. This change adds continuity to the process, so parents and providers alike are monitoring progress each step of the way. The CDC also updated their Milestone Tracker app to reflect these changes, making the content more accessible to parents.

These changes are also intended to place less emphasis on the milestones themselves by creating a more comprehensive guide to child development. As a result, providers added open-ended questions that parents can use to start discussions with their child's doctors. Along with more developmental activities and advice, this is intended to let parents know that milestones are not the only factor to consider in their child's wellness. Parents and professionals should also consider what makes a child happy, what might trigger certain behaviors, and how they consistently behave in their natural environment.

There are many challenges in creating developmental milestones, since each child develops differently and there is a wide range of levels to take into account. Another barrier is that the original milestones were formed with some consideration given to developmental theories, such as Bandura's social learning and Piaget's stages of language acquisition. These theories often structure treatment, so there should be some alignment between the normative milestone data and theory bases. Some providers view developmental theories and milestones as being too deterministic, since some people might wrongly assume that early delays predict concerns later in life. In fact, the opposite is true, since these milestones are intended to aid in the early identification and treatment of delays, which lessens the likelihood of these concerns persisting.

The data that is used to form these milestones should also take a range of perspectives into account. This is because children being tested in formal environments such as the doctor's office may struggle to understand directions, act differently in an unfamiliar

environment, or demonstrate fear, boredom, and resistive behaviors that all impact performance.

Section 1 Personal Reflection

What other areas might an occupational therapist ask parents about to create a full occupational profile for their child?

Section 2: Role of Early Intervention

2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17

Early intervention (EI) refers to any services that are used to habilitate children between the ages of 0 and 3, which is why EI is also called “birth-to-three.” The timing of these services is crucial because the connections in a child’s brain are the most active during the first three years of life.

These services are available in each state and are offered to children who meet the criteria for having a developmental delay. Since these are provided through state programs, children and their families can access these services at little or no cost to them. Early intervention will look different for every child, but services might include care from any of the following disciplines:

- Speech and language therapy
- Occupational therapy
- Physical therapy
- Nutrition
- Audiology
- Medical
- Psychological/counseling services
- Nursing
- Assistive technology

Physical therapy and occupational therapy focus on physical skills such as walking, reaching, crawling, rolling, and standing. Speech and language therapy will work to

improve a child's cognitive processes - such as their ability to think, learn, and problem solve - as well as their communication, including the ability to talk, listen, and understand concepts. Occupational therapy along with speech and language therapy will focus on the social and emotional aspects of play, including coping skills, emotion expression, and frustration tolerance. Occupational therapists will also help children prepare to assist with self-care tasks such as eating and dressing.

Children might be recommended for EI services shortly after birth, especially if they were premature or had an extended stay in the Neonatal Intensive Care Unit (NICU). Other children might demonstrate more gradual developmental delays in the above areas, which would still make them eligible for these services.

There is a range of evidence supporting the effectiveness of early intervention in the lives of children with delays in any area. Particularly, early intervention has been shown to:

- Change a child's developmental path
- Strengthening a child's ability to form positive relationships
- Teach kids new skills
- Improve outcomes for families and the community
- Encourage children to learn through play
- Empower and educate families to better meet their child's needs

Early intervention has also been shown to reduce a child's need for specialized instruction during a child's school years. This suggests that early intervention has the potential to positively influence a child's academic performance and success over the years. Another reason there are so many positive outcomes associated with EI is because it takes place in the child's natural context.

Studies have looked at the efficacy of early intervention services for specific populations. One piece of research compared the impact of early intervention to a follow-up program for children with cerebral palsy. Most of the children in this sample were also severely premature. In this instance, there were no significant differences in outcomes between these two services and all participants experienced a decreased rate of contractures.

Another study focused on how EI influenced functional outcomes in children with expressive language delays. This research focused mainly on comprehension abilities.

Results found that early intervention lowered the risk of poor listening and reading comprehension by 39% in children who were later diagnosed with speech and language disorders.

One study looked at the type of EI services being provided to over 2,000 infants and toddlers in an urban community. Results showed that each of these children were receiving low-intensity services with an average of less than 3 hours being provided each month. This study also emphasized the importance of increased service frequency and duration for particularly vulnerable children and their families. Several other studies echo these same concerns. These researchers state that high-quality home programs are especially indicated for families of those with autism who cannot afford services outside of what the state offers. On the other hand, a study focusing on toddlers with autism suggests these children and their families are a better fit for low-intensity EI services over a longer period of time. Similar studies found that interventions with a strong focus on the family unit were most effective for children with autism as was a combination of developmental and behavioral strategies. Another piece of research involved providing pediatric patients in an urban healthcare system with greater service intensity, which led to more functional gains. However, this study determined the frequency of services previously provided to these patients was not timely enough (since they were on wait lists for an extended time) nor sufficient to remediate their developmental delays.

One study that viewed the impact of EI service intensity on a child's outcomes found that higher intensity services were more often provided to children 2 years and older. Results also showed a strong correlation between the child's age, the intensity of services implemented, improved social skills, and gains in cognitive function. These outcomes were tracked when the children aged out of their EI programs. Another study viewed the specific gains that children with autism experienced as a result of EI services. This research found that social communication was positively impacted the most by both therapist- and parent-directed interventions.

A different study looked at parental satisfaction with early intervention provided to infants recently discharged from the NICU. Functional outcomes of the program were not assessed in this study. This research compared satisfaction levels associated with 120 and 90 minutes of weekly treatment. Despite some previous research suggesting the need for higher treatment frequency, this study showed that parents in both groups were equally satisfied.

While early intervention has been proven effective in many ways, the same type of EI doesn't produce positive outcomes for every child. There are many factors that

determine how impactful these services are. Other research shows the best way to maximize a child's outcomes is by combining multiple intervention approaches across several disciplines. These researchers also state that providers should place an emphasis on consistency and parental participation. A separate study found that a transdiagnostic approach was the best option for children with neurodevelopmental disorders such as autism, since this allows providers to focus more on symptoms rather than the condition. This is fitting for rehabilitation professionals, since two children who share a diagnosis will not behave exactly the same. Therefore, a therapist's primary aim is to manage presenting concerns such as behaviors, mental processes, and physical symptoms.

Timing is another factor that is of the essence in the early intervention realm. The consensus across the board is that the sooner a child enrolls in early intervention, the better their outcomes will be. Several studies support these findings. One piece of research showed that hearing-impaired children who enrolled in EI between the ages of 2 and 3 experienced below average school readiness and communication skills.

There is a range of evidence in support of EI, but the majority of studies emphasize the importance of starting these services as soon as possible and getting the appropriate frequency to produce optimal outcomes.

Section 2 Personal Reflection

What might be an appropriate service intensity for children with mild developmental delays?

Section 2 Key Words

Audiology: A medical discipline that address hearing loss and other hearing impairments

Early intervention: A set of comprehensive services intended to address developmental delays in children between the ages of 0 and 3

Neonatal Intensive Care Unit: A specialized unit of the hospital that provides intensive medical treatment for newborns, including those born prematurely and those with medical concerns; also known as the NICU

Section 3: Gross Motor Development [1,2]

Gross motor skills are not only a crucial part of a child's development, but they also have an impact on the work occupational therapists do. While pediatric OTs often emphasize fine motor skills as they pertain to handwriting and scissoring, they focus on more fundamental skills for young children. Therapists can address gross motor function as it pertains to self-care skills and motor planning. But children must achieve stability in larger, proximal muscles before therapists can strengthen the distal muscles responsible for fine motor control. This is why therapists should always monitor a child's gross motor skills, since mastery of these milestones will impact a child's ability to make progress in other areas.

As we mentioned, one of the biggest changes to the gross motor development section was removing the crawling milestone altogether. The CDC and AAP also adjusted ages for several gross motor milestones.

At two months old, a child should be able to hold their head up when placed on their stomach, move both arms and both legs, and open their hands briefly. If a 2-month-old lacks head control, an OT will have difficulty sustaining their level of arousal to engage them in therapy. Without active motion in the arms and legs as well as the ability to open their hands, the OT will be unable to address basic skills such as reaching and grasping for preferred objects.

At four months old, a child should independently hold their head up, swing at toys with one arm, bring their hand to their mouth, and push up onto their elbows and/or forearms when they are on their stomach. If a child at this age still lacks head control, the OT will have similar concerns regarding their level of alertness. If a child is unable to bring their hand to their mouth, they will be delayed with self-feeding. Without the ability to push up onto their elbows, a child will not build the core strength they need to sit unsupported and the shoulder girdle strength they need to effectively use their arms.

At six months, most children should be able to roll from their stomach to their back, push up with their arms when on their stomach, and lean on their hands when sitting. By the time a child is 9 months old, they should be able to get to a seated position and stay there without support. Rolling is one of the first and simplest types of bed mobility, so a child who is delayed in this skill will have trouble self-positioning. By leaning on their hands when sitting, a child is beginning to build bilateral integration skills they will need to engage in many functional tasks.

Some of the most notable milestones come at a child's first birthday. At 12 months, a child will be able to pull to a standing position and walk by holding onto furniture and other items around them. At 15 months, a child is often able to take a few steps independently. The 18-month-mark also brings about several major milestones, including walking without holding onto anything and climbing on and off a couch or chair without any assistance. Pulling to stand requires core strength and even more bilateral integration, which a child needs to sit upright unsupported, stand, walk, and climb. If a child lacks the core strength to pull themselves into standing, they will be delayed in the other skills. This limits their ability to engage in many therapeutic activities and even self-care tasks, such as toileting. If a child lacks bilateral integration, they will struggle to interact with small objects, write, self-feed, manipulate fasteners on clothing, and more. If a child is delayed in walking, they will not be able to explore their environment as well as they should. This will prevent them from being exposed to new sensory experiences and limit their ability to get around school, when the time comes.

By 2 years, a child should be able to kick a ball, run, and walk up and down several stairs (often with some help). At 30 months, a child should be able to jump off the ground with two feet. By the age of 4, a child should be able to catch a ball with decent accuracy. By the age of 5, a child should be able to hop on one foot. If a child struggles with ball skills (catching and kicking), running, hopping, and stair climbing, therapists might struggle to engage them in meaningful play, age-appropriate sports, and motor planning activities. Feelings of frustration or embarrassment might begin to arise here. These delays and the associated emotions might lead a child to have trouble socializing with peers who are typically developing.

According to the new criteria, 75% of children should be completing these milestones at the indicated ages. Therapists should refer children to physical therapy if their gross motor skills are falling behind that of their peers. This is best practice and will often help the child perform better in occupational therapy and other disciplines.

Gross motor function is a crucial part of a child's development and it plays a part in the progression of adaptive and fine motor skills. As a result, occupational therapists should monitor these skills as part of well-rounded, child-centered treatment.

Section 3 Personal Reflection

What activities might a therapist use to help enhance a child's gross motor skills in preparation for ADL training?

Section 3 Key Words

Bed mobility: A series of self-positioning motions, including rolling, scooting, pelvic bridging, going from side lying to sitting, going from sitting to lying down, and sitting at the edge of a bed or chair

Core strength: The abilities of the pelvic and spinal muscles to keep a person upright

Distal muscles: Muscle groups that are farther from the body's core; they are usually smaller and found in the extremities including the forearm, lower legs, hands, and feet

Proximal muscles: Muscle groups that are closer to the body's core; they are usually larger, found around the torso, and keep large body parts together against gravity

Self-positioning: The manner in which a person positions themselves without any help

Shoulder girdle: A musculoskeletal complex consisting of the clavicle, scapula, and the neck of the scapula that connects to the humerus

Section 4: Fine Motor Development [1,2]

Fine motor development is commonly known as the crux of what occupational therapists do. But therapists know that our role goes far beyond that. And when treating children, this skill area doesn't just involve preparing kids for handwriting and scissor skills. Fine motor skills play a large part in how a child manipulates a range of small objects, from finger foods to beads to blocks to buttons. It might be hard for parents to see smaller bits of progress in this area, since larger movements such as rolling, sitting on their own, and walking are typically more noticeable. Yet, there is a definite progression in a child's fine motor skills between birth and the age of 5.

By 4 months old, a child will not have much fine motor function, but they should be able to curl their fingers slightly around a toy when it's put in their hand. This is still partially reflexive; since the grasp reflex, which is triggered by stimulus in the palm of the hand, is present until 5 months. However, this prepares a child for more precise and intentional grasp patterns as they mature. At 9 months, a child is expected to use their fingers a bit more purposefully by raking food toward them during mealtime. The raking grasp involves slight flexion of all fingers, which prepares a child to more fully grasp items by flexing fingers to form a loose fist. By this age, a child will also show some of the first signs of bilateral integration by moving items between their hands. Bilateral integration

skills are crucial for other fine motor tasks like writing, playing with toys, and dressing as well as foundational gross motor skills such as walking, catching a ball, and more.

By 12 months, a child should be able to drink from a cup without a lid while an adult holds it. They should also be observed picking items up between their thumb and pointer finger. Isolating two fingers will not only allow children to pick up small items, but it will eventually help with a mature tripod grasp involving opposition of the thumb and pointer finger. Drinking from a cup without a lid is one of the first tests of hand-eye coordination and fluidity of movement. The same smoothness of motion that prevents spillage will also help a child write legibly, button their shirt, and complete other functional tasks that require a steady hand.

At 15 months, a child will progress to self-feeding with their fingers, which will prepare them for utensil use and help them explore various types of tactile input. At 18 months, a child should be able to use a writing utensil to scribble, independently drink from a cup without a lid (while experiencing some spills), feed themselves with their fingers, and try to use a spoon occasionally. They will usually use a fisted grasp or radial palmar grasp when holding their writing utensil. Drawings will often not be recognizable at this age, but this prepares children to eventually color within defined spaces and make straight or curved lines to form basic shapes. These lines will then become more complex in their formation to trace and then copy letters. The refined three-jaw chuck that a child uses with increased independence when finger feeding will become a radial cross palmar or digital supinate grasp to manipulate a feeding utensil for the first time.

Once a child reaches the age of 24 months, they should be able to eat almost independently with a spoon. At this point, they will also be using a more mature chuck grasp on a spoon. This finger position on a feeding utensil will also prepare children for a more precise pencil grasp.

At 30 months, this improved dexterity will allow children to use their hands in more purposeful ways by turning door knobs, twisting lids, and removing caps. This is when the power grip begins to evolve and strengthens even more in the coming years. By this time, children can also assist with undressing and will remove some articles of clothing on their own. This further aids in the development of bilateral integration and adaptive skills. At this point, children can also demonstrate more delicate motions by turning book pages one at a time.

At 3 years old, a child should be able to string items (such as beads) together, put on some articles of clothing independently, and use a fork on their own. Stringing small

objects like beads requires a precise pincer grasp, good coordination, and the visual motor skills to consistently match up the hole with a small piece of string or rope. This adds another layer of endurance to a child's already growing fine motor strength. The series of steps involved in stringing items also helps develop a child's motor planning skills. Up until now, most of a child's motions have been one-step. Putting on articles of clothing further assists with a child's motor planning abilities since they should now begin to choose weather-appropriate clothing and orient clothing properly on the body. Children who finger feed do not need as much precision when picking up food items, but using a fork requires more accuracy for safe usage and to spear the right amount of items before placing them in their mouth. This sort of accuracy will be important when they begin to use other utensils, such as knives.

At 4 years old, a child's feeding and dressing skills will continue to develop. They should be able to serve food themselves, pour themselves a glass of water, unbutton fasteners on clothing, and hold a crayon between their fingers and thumbs. Just as choosing weather-appropriate clothing is a higher-level function that older children can manage, children at this age begin to understand portions, can scoop with less spillage, and might even be able to manage an adult-sized plate. This improved coordination also assists them in pouring liquids with improved accuracy, which will continue to develop as they age. An even more defined pincer grasp will help kids manage buttons, first with unbuttoning. This then leads them to begin buttoning at the age of 5. Kids will use the same fingers involved in a pincer grasp to develop their pencil grasp into a mature tripod. At this age, children use a static tripod grasp that involves the appropriate fingers but has more wrist movement than finger movement. By the age of 6, this should progress to more finger movement with a stable, neutral wrist. This is the dynamic tripod grasp that most adults use to write.

As with gross motor milestones, these milestones are representative of how 75% of children are performing. While it's well within an occupational therapist's scope of practice to address fine motor skills, they should always keep other team members updated as to a child's progress in this area since it can impact their plan of care. Interprofessional communication can also lead to collaboration in instances like cotreatments with physical therapy or speech therapy. Occupational therapists might also work with assistive technology professionals after a child has been prescribed adaptive equipment or needs to have existing technology modified.

Section 4 Personal Reflection

How might a child's fine motor skills impact their participation in speech therapy? How might a child's fine motor skills impact their participation in physical therapy?

Section 4 Key Words

Adaptive skills: Practical skills that someone uses to function and respond to the demands of their surroundings; this often falls under the category of self-care skills

Dynamic tripod grasp: A mature pencil grasp that involves a stable wrist with movement of the index finger, middle finger, and thumb

Fisted grasp: A grasp that children often use when first manipulating writing utensils; this involves placing a closed fist around a pencil or crayon

Fluidity of movement: The quality, smoothness, and ease of a person's motions that is determined in part by their coordination skills

Radial palmar grasp: An immature grasp that involves holding an object in the palm with support from the thumb, index, and middle finger

Raking grasp: An immature grasp that involves extending all of the fingers to pick up an object

Static tripod grasp: A semi-mature pencil grasp that involves movement of the wrist while grasping a utensil with the index finger, middle finger, and thumb

Section 5: Visual-Motor Development [1,2,18,19]

A child's vision develops at a different rate than their other milestones. In particular, most of their visual functions are fully developed by the age of 2, while some improvements continue until the age of 6.

When a baby is born, their primary visual function is the ability to see highly contrasted images. By the first month, their two eyes work together more readily and they can see objects between 8 and 10 inches away. This is also when their hand-eye coordination begins developing alongside their reaching skills, since their vision is able to periodically fixate on the few objects they can interact with. At this point, they are still only able to see blurred objects, not faces. Once they reach two months old, they are able to focus more on the faces of familiar people. Since their eyes are still not fully coordinated at

this point, it's common for providers and parents to notice instances of being cross-eyed or having a wandering eye. If these signs persist beyond the age of two months, then it is considered abnormal and should be further assessed.

At three months old, a baby's visual pursuits begin to develop and allow them to follow objects and attempt to grasp them. By 4 months old, babies develop more neck strength and head control. This stability allows them to maximize their current visual abilities and see more clearly. Having more head control also allows them more autonomy in what they see.

Between 5 and 8 months, a child's visual control and hand-eye coordination continue to evolve. This is also the first time their depth-perception and color vision can be noted. As a result, this is a great time for therapists to begin more game-based play, such as peekaboo, to stimulate their vision.

If babies crawl before they learn to walk, it usually happens around 10 months old. At this time, their eye-hand-foot coordination develops even more. It is thought that children who skip crawling altogether - going from sitting and rolling to walking - do not have as developed coordination skills. This is likely since they didn't get the opportunity to explore their environment in such an active, self-directed way. At around 10 months old, babies will also be able to track objects that move fast.

Between 9 and 12 months, babies have better judgment of distances and can somewhat precisely throw objects. Between 1 and 2 years, their depth perception and hand-eye coordination are considered well-developed. However, children continue to experience progress in depth perception until the age of 6. Their acuity also continues to improve to 20/20 until the age of 3. As their vision continues to become more precise, children will become increasingly interested in interacting with their environment, exploring new imagery, looking at picture books, and drawing or scribbling. These are all great ways for therapists to further encourage a child with weak visual-motor skills.

While the AAP and CDC have not specifically set forth their own milestones related to visual-motor abilities, this is a very important aspect of a child's development. If a child's visual skills are very far behind this timeline, it can impact the development of their fine motor skills, vestibular system, sensory modulation, and more. There should be a good balance between all of these skills in order to encourage proper development. If a child is experiencing any concerns in the area of visual-motor development, therapists should recommend that they consult a vision specialist.

Children get very basic eye exams as part of their wellness visits to a pediatrician. If the pediatrician determines the child has a family history of vision problems or if they suspect an issue with the child's vision, they will be referred to an optometrist. Optometrists are considered primary care doctors for the eyes, so children between the ages of 6 months and 2 years will receive regular eye exams to prevent any concerns from arising. If a child needs surgery to fix a vision problem or there are more complex, neurological concerns related to vision, they should be referred to a pediatric ophthalmologist.

Section 5 Personal Reflection

How might an occupational therapist collaborate with an ophthalmologist to enhance a child's visual-motor skills?

Section 5 Key Words

Ophthalmologist: A healthcare professional who can diagnose and provide medical and surgical treatment for vision concerns and eye conditions

Optometrist: A healthcare professional who can diagnose and medically treat certain vision concerns and eye conditions

Section 6: Social and Emotional Development [1,20]

While some of the other skill areas had more significant changes, the CDC and AAP found the biggest data gaps in social-emotional and cognitive milestones. This is perhaps the area that was added to the most, while adjustments were the focus of changes related to the other milestones.

By 2 months old, a baby is expected to calm down when an adult speaks to them or picks them up. At this age, they also look at adult faces and demonstrate happiness (often by smiling) when others approach them. Happiness is a basic emotion, which is also a big indicator of a child's reactivity. If a child fails to demonstrate happiness in response to such basic scenarios, they may struggle to adapt to other situations that arise as part of daily life. This can negatively impact their occupational performance, their willingness to try new activities, and their ability to engage with those around them.

At 4 months of age, babies learn how to smile to get positive attention from others and giggle briefly in response to playful interaction with adults. Babies will also begin to

comprehend other ways to get (and keep) adult attention, including making eye contact, moving, or making sounds. These milestones are important since they mark the beginning of reciprocal communication. Up until now, interaction with a baby usually involves adults making faces, talking, picking the baby up, and more. But these are the first signs of a baby purposefully reacting to engage with others. This will help a baby interact more with their family and those they know. Moreover, engaging with others will allow them to build a relationship with providers involved in their care, which will only help them develop more.

This type of interaction continues to develop from here. A 6-month-old baby should be able to recognize familiar people, look at themselves in the mirror, and laugh. Looking in the mirror improves a child's awareness of themselves and their features. This will help them eventually learn body parts, recognize certain sensations, and build body awareness. When a child learns to recognize familiar people, this is helping build their long-term memory and solidify experiences for them. This will play a crucial role in early learning when they begin to explore patterns, shapes, colors, letters, and numbers. At 6 months old, babies do a better job of fully laughing in response to adult interaction as opposed to briefly giggling or chuckling at 4 months old. Laughter might seem less important than other milestones, but humor plays an important role in stress management. Being able to manage stress and control emotions will help children cope with failure, anxiety, fear, and more, which will all arise as they age.

At 9 months, babies will develop more notable responses to individuals who they are not familiar with. They will become shy, attached to parents, and possibly even fearful in the presence of strangers or those who they don't know well. These responses are important because they help children form healthy attachments. At this age, children with delayed social development might be overly attached to their parents, which might lead to them screaming or crying beyond consolation when they are briefly separated from their parents. The opposite might also occur and can cause children to approach strangers without hesitation. Both of these behaviors can impact someone's ability to keep themselves safe within healthy, meaningful relationships, so they will influence how a child functions socially.

At 9 months old, a child's emotions will also develop from laughing and crying to happiness, sadness, surprise, and anger. Children at this age will also look up when they hear their name and respond (cry, look around, reach out, etc.) when their parent(s) leave the room. Their ability to smile and laugh continues to develop and children should now be able to do this in response to specific games, such as peekaboo. This

allows children to engage more with providers and caregivers while playing therapeutic games that further enhance their development in many skill areas. By briefly responding when their name is called, children are being prepared for more substantial communication such as walking toward the person who called them, doing what was asked of them, and engaging in conversation. This will help children form two-way relationships while eventually teaching them to follow instructions.

At 12 months, the games that a child can engage in become a bit more complex, such as patty cake. This is due to increased coordination and body awareness. By 15 months, a child should mimic children playing, clap, showcase preferred objects, and hug people and objects. The demonstration of preferences allows children to begin expressing themselves more readily and will shortly lead them to verbalize not liking. It's crucial that therapists know this so they can learn a child's likes and dislikes to customize the therapy process for them. This will also dictate a child's motivation for therapy and engaging in certain activities. Volitional clapping is a good indication of bilateral integration, which therapists can expand upon through both functional and play-based activities. A child's ability to mimic others will also play a part in the therapy process, since therapists often model behaviors to help children learn. This should also be part of parent training, since families can encourage a child's learning by demonstrating certain activities at home. Hugging is a sign of affection related to a child's preferences, since they will begin to show a stronger bond with those they are familiar with. This demonstration of affection will help them form relationships and communicate with others as they get older.

By 18 months, children begin getting more adventurous and will actively participate in self-care. At this age, it's normal for kids to venture a bit farther away from parents and familiar figures, but they should still look to them for safety and comfort. This is an important step as children learn to build their own identity and pursue their interests while still maintaining a healthy attachment to those they are familiar with. They will point to objects to show others and will follow several pages in a book when it's being read to them. This helps kids develop their visual attention skills and activity tolerance, which is important once they attend therapy and school. In terms of self-care, children at this age will recognize when it's time for hygiene routines by putting their hands out when it's time for adults and caregivers to wash them. They will also help with dressing by putting an arm through a sleeve or a foot through a pant leg. These two self-care milestones are important because they show anticipatory reactions. Once a child starts assisting with self-care with the knowledge of knowing what body parts go where, they will have an easier time sequencing the steps of feeding, dressing, and more.

The 2-year mark is when children develop even more emotional intelligence. This is when they become more attuned to how others feel and can tell if someone is upset or sad. Children at this age are observed to change their own facial expressions in response to the negative emotions of others. For example, if someone else is crying, a child might look sad or concerned. They will also pause their activity or conversation to pay more attention to the other person. In alignment with this, they become more interested in how others respond to them. So, a 2-year-old should not only be able to sense the negative emotions of others, but also initiate the process of finding out how they feel. These are two important components of communication, since people should be attentive to the emotional needs of others. This helps form a bond while also teaching children empathy, stress management, and conflict resolution.

At 30 months old, a child is expected to play next to other children and occasionally play with them. They will verbally call others to get their attention when they want to show them a skill or toy. Kids at this age can also follow basic commands and will pick up on certain routines such as getting ready for bed and cleaning up toys. Routines give children a sense of predictability, which is comforting as they learn new skills and experience new things. If children get used to routines early on, this will eventually help them manage time and expectations while lowering stress levels. Up until this point, most kids don't know how to express a desire to interact with others, so those who verbally communicate this need learn to interact in a socially-appropriate way that others respond positively to. Playing alongside others involves reading cues from others before approaching them, which is another important communication skill that will help with relationship building.

By the age of 3, children demonstrate more progress in the area of attachment. At that point, they should calm down (either by self-soothing or with help from others) after 10 minutes of being separated from their parents or other familiar figures. This not only prepares children to engage in activities without their safety net, but it helps them develop a healthy stress response early on. This will help with a variety of life experiences that are crucial to a child's development. At this age, a child will also become more aware of others socially and will join their peers in games or while playing with toys. This type of behavior will help children integrate more naturally into social situations, some of which will be unfamiliar to them. This further aids in their attachment skills, since social integration requires forming a bond with another person.

At 4 years old, children engage more in pretend play (especially roles that involve helping others) and will ask their parents to travel to see friends. This shows more

developed awareness, since children at this age know who is and is not in their direct environment. This also demonstrates more complex thinking, since they don't know how to get to the person they want to see but they do know who to ask to make it happen. When children ask to see friends who are not present, this is also considered demonstrating a preference for certain people. This is a more mature behavior than making friends simply out of opportunity, e.g. playing with those who are already in the room. This higher level thinking will continue to progress as they begin to make plans surrounding their relationships with others. Pretending stimulates a child's creativity and imagination, which is a practical skill that can help them get more out of playing and therapy. Pretend play involves assuming certain roles, which helps children indirectly learn more about the world around them. Children who engage in pretend play also learn from the roles their peers have assumed and are more prepared for real-world situations.

Emotional awareness also continues to develop at this age; children will comfort others who are upset and take steps to keep themselves safe by avoiding danger. This shows concern for their own safety and the well-being of others. This will help kids adjust their behaviors according to their location. For example, children become better at using an indoor voice in quiet places and going outside to play with large toys. For the most part, children's behaviors up until this point have focused mainly on themselves. But these milestones are a major sign of a child's awareness of how they fit into the world around them.

At the age of 5, children get better at following rules, taking turns, and doing simple chores at home. They will also get more creative by singing, acting, and dancing for others. Chores outside of basic adaptive skills, such as clearing the table or helping with the family's laundry, show a continued awareness of and capacity to selflessly help others. Acts such as singing and dancing not only demonstrate creativity, but they give children the chance to develop talents and show them to others. This helps with building confidence, since it can be scary doing this in front of others when children aren't sure of the reactions they will get. This will translate to strengthening relationships and demonstrating communication skills with others.

As with the other categories, each of these milestones indicates the developmental levels of 75% of children at that age. If occupational therapists note that a child is not meeting these milestones, they should consider making a referral or communicating this to other members of the child's care team. In some cases, behavior therapists or special education teachers can address areas such as emotion regulation, stress management,

and difficult behaviors. However, it is important to note that major delays in the areas of social-emotional development could be a sign of autism. If you suspect this is the case, you should mention this directly to the child's pediatrician so they can complete the necessary evaluations to assist with obtaining an early diagnosis. Doctors can usually make an autism diagnosis by the age of 2, but it's possible for some signs and symptoms to be observed as early as 18 months.

Section 6 Personal Reflection

Which social-emotional milestones might be delayed in a child who has autism? What about a child who has attention-deficit disorder?

Section 6 Key Words

Anticipatory reactions: Actions that a person takes in preparation for a certain event or situation

Emotional intelligence: The ability to connect with and manage one's emotions in a positive way to communicate, empathize, resolve conflict, and manage stress

Pretend play: The act of assuming certain roles and identities to learn more about socialization, responsibilities, and emotions

Section 7: Language Development [1,20]

In accordance with a child's social and emotional development, language also progresses quite a bit in the first five years of their life. At the age of 2 months, a child begins to make sounds outside of crying and will also react to loud noises. This shows an improvement in awareness and development of the auditory systems, which both play a large part in how someone experiences the world around them and communicates. By the age of 4 months, babies will begin to coo and will make sounds in response to being talked to. They will also turn their head when they hear someone's voice. This marks the beginning of reciprocal communication in the most rudimentary form, so this will be a crucial part of how a child interacts with others.

By 6 months old, a child will take turns making sounds with you, blow raspberries by sticking their tongue out, and squeal out of happiness. Making these noises not only gives children an initial sense of body awareness and oral-motor stimulation, but they also can be used as a self-soothing technique. At 9 months old, a child's repertoire of sounds further expands to noises like "mamamama" and "babababa." This is the first

time their communication goes from singular noises to a combination of syllables and vowels, which will later help with the formation of words. At this age, children will also express the need to be picked up by lifting their arms up to the sky. 9-month-old children lack the ability to verbalize this and other requests, but are more knowledgeable about non-verbal cues that can get their needs met.

At 12 months old, a child will wave goodbye, can grasp the concept of “no,” and call their parents by their names. By learning what the word “no” means, a child will have an early sense of right and wrong and can use this to govern their actions. Waving goodbye gives children a general idea of what cause-and-effect is. For example, when someone is waving goodbye to someone, that means one of those people is leaving. Once children have a better idea of cause-and-effect, they can begin to participate in games that involve this concept. Calling someone by their name is a more direct and effective way to interact and politely express your needs, so this is another important step in communication development.

By the age of 15 months, a child will begin to say one or two basic words, look at a known object once someone names it, and follow directions that consist of verbal instructions and gestures. Children at this age will also point to something when asking for help. By adding one or two words to their vocabulary, a child will soon be able to combine them to communicate. Their increased knowledge of familiar objects will help with identification when retrieving objects and using them appropriately. When children point to items they want, this is another way of expressing their needs before they can say how they feel.

At 18 months of age, a child should be able to say 3 or more words aside from “mama” and “dada.” This allows them to more readily express their needs, which is helpful in managing emotions and behaviors. Kids at this age should also be able to follow 1-step directions without any other assistance. This is particularly useful for therapists and other healthcare providers who need to know how to guide a child through a game or task.

By 2 years old, a child is expected to point to pictures in a book when you ask about them, string at least two words together in the form of a command or request, visually identify at least two body parts, and use gestures other than waving or pointing. Identifying body parts helps children become more aware of their body and the function of each part. Stringing words together will help children eventually form more detailed sentences to verbalize how they feel and what they want. Children who are two years

old should be able to copy more complex gestures such as blowing a kiss or nodding. This helps strengthen their ability to motor plan as they age.

A 30-month-old child should have around 50 words in their vocabulary. Within this improved repertoire will be the ability to say two or more words along with one action word. This even more closely resembles the form of a sentence, since most of the words they pair with action words will be nouns as the subject of the sentence. Children at this age will also name objects when they see them in books. They also become more inquisitive and will ask what things are when no one has told them. The grammatical accuracy of their sentences improves, as they will include pronouns such as “we,” “me,” and “I” as the subjects paired with action words. This helps children begin to communicate in a more universal and acceptable way.

At the age of 3, a child is expected to sustain a conversation with an adult with at least 2 exchanges. They will begin to ask more specific, but purposeful questions using the subject and action word structure. These questions contain words such as “who?” “what?” “where?” “when?” “why?” and “how?” The answers they get from these questions will help children build a greater awareness of the world and people around them. 3-year-olds also look for practical applications to use action words in by describing what is happening around them with simple verbs such as playing, sleeping, eating, or running. These words will help them continue to describe their surroundings. Up until now, children have been introduced to others around them, usually through their parents who have told them to greet the other person. However, by this age, a child should be able to independently greet someone by saying their name without being prompted to. This will help them someday initiate interactions with others entirely alone. Their comprehensibility should also have improved to the point where most other people can understand them most of the time. This will help them integrate better into social situations that are solely focused on conversation.

At 4 years old, children should be able to speak in sentences with four or more words and recite some words from familiar songs, rhymes, and TV shows. This further assists with their ability to be understood, better answer questions asked of them, and speak with more detail (especially colors and other basic adjectives). They can usually talk about at least one thing they did that day and can answer basic questions that contain the “5 Ws.”

At the age of 5, a child can tell stories (real or imaginary) that contain at least two events. They also have an increased level of reading comprehension, so they can answer simple questions about a story they heard or read. Their conversational skills are also

better at this age, and they can engage with others via three or more back-and-forth interactions. 5-year-olds are also able to recognize simple rhymes when presented to them in games or stories.

These milestones are indicative of how 75% of children at these ages are performing. This means a child who demonstrates any delays in these areas should be referred to a speech-language pathologist to ensure they do not fall behind their peers. If a child has delayed communication – between the ages of 0 and 5 or beyond this point – they will struggle to interact with healthcare providers and teachers as they address other skill and learning areas. This will cause them difficulty comprehending and following directions from others as well as trouble relaying information. Expressive delays will also make it harder for a child to tell others how they feel, which can cause concerns related to behavior, emotion regulation, confidence, relationships, and self-care abilities.

Section 7 Personal Reflection

How might an occupational therapist incorporate language development into therapeutic activities?

Section 7 Key Words

Auditory system: This body system includes peripheral structures of the ear (inner, middle, and outer) and parts of the brain that control auditory processing

Cause-and-effect: A concept that involves the impact that one object or situation has on other related or nearby objects and situations

Expressive communication: The act of outwardly communicating wants, needs, preferences, and intentions

Receptive communication: The ability to obtain and comprehend information

Reciprocal communication: Communication that is equally shared between two people

Self-soothing techniques: Any strategy or behavior that someone uses to independently regulate their own emotions

Section 8: Education

1,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40

Parents and families play an important role in helping children develop and, if needed, getting them early intervention services. All children undergo developmental screenings at 9 months old, 18 months old, and 30 months old. They are screened specifically for autism spectrum disorder at 18 months old and 24 months old. During this time, a child and their parent(s) visit a trained professional who will take a closer look at the child's skills to determine if they need any services to help them develop.

Developmental screenings differ from developmental monitoring, which is done by parents, caregivers, and family members on a regular basis. This allows parents to relay pertinent information to their child's providers and celebrate the progress their child has made. Developmental monitoring can only be done if parents have sufficient information about how their child *should* be progressing at each age. This way, they can identify problems early on and contact the right person. By mentioning these issues to a child's pediatrician, parents can usually get the best advice. General providers can offer tips to facilitate a child's development or give a referral to the appropriate provider for more testing.

There are a variety of resources available to help parents in this process. Families can use the CDC's Milestone Tracker mobile app or a desktop computer to access the milestone checklists for each age. Some families may not be able to access these materials independently, either due to lack of internet access or poor health literacy. If this is the case, it's important for healthcare providers to offer more comprehensible information so parents can best help their children. Parents should be instructed to look for any problems their child might have in the areas of walking, talking, or eating. This is usually where the most obvious problems arise.

Providers should also instruct parents in positive parenting practices to encourage better development. This involves establishing routines, setting basic house rules, and giving children a sense of predictability - especially in how you respond to them. This will all help lessen the impact of upsetting events and situations. Parents should also be reassuring and sensitive to their child's problems and find a balance between consistent discipline and comfort. This provides further structure but also sets parents up as a positive figure children can turn to in times of need. It is also a good habit for parents to read books and talk with their children. This might be the only way parents learn their child is struggling to adjust, feeling alone, or needing help in certain areas.

Parents of children between the ages of 0 and 1 should be educated in some of the following tips to encourage development:

- Talk, read, and sing to your baby when they are alert and relaxed
- Praise and cuddle your baby
- Copy your baby's sounds to help them develop language
- Play soothing music for your baby
- Set routines for feeding and sleeping
- Limit screen time, since screens are not recommended for children under the age of 2
- Look for signs of fussiness, sleepiness, hunger, or fullness to learn their preferences and moods
- Encourage your baby to look at toys while on their stomach by placing them above their head
- Stay calm when your baby is upset and teach them to self-soothe by talking softly, giving them a preferred toy, gently rocking, and letting them suck on their fingers or a pacifier
- Don't shake your baby under any circumstances
- Place your baby on their back to sleep and on their tummy for several hours during the day
- Talk about objects when your baby looks or points at them
- Look at pictures with bright colors, faces, or patterns
- Practice personal self-care to relieve parental stress

Parents of children between the ages of 1 and 2 should learn these tips:

- Child-proof the home to keep dangerous objects and areas away from your child
- Teach your child different body parts
- Play matching, sorting, and counting games with your child that encourage them to use both hands

- Encourage your child to interact with new objects
- Let your baby push objects around, as this strengthens the muscles needed for early walking
- Continue to build off their language by making new noises and mimicking their noises
- Allow your child to help feed and dress themselves
- Avoid baby walkers and instead let your child use furniture and other stable objects to learn how to walk
- Limit punishment for negative behaviors (firmly saying “no” is sufficient) and strongly encourage positive behaviors when they occur; use punishment as a learning experience and tell your child what they should do
- Let your baby get used to being around other family members and caregivers without you around; bring preferred toys and comforting objects to make the transition easier
- Give your baby water, milk, or breast milk, but try to avoid juice and other sugary beverages
- Offer your baby mashed or chopped foods of various textures and flavors; avoid any foods that pose a choking hazard
- Encourage your child to name common objects and explore new places with you, like the park or the zoo

Parents of children between the ages of 2 and 3 should:

- Start reading books to your child at a certain time, e.g. before bed or in the morning
- Encourage pretend play and games like follow the leader
- Narrate your actions as you interact with certain items and encourage your child to copy you
- Sing and play songs that involve certain gestures or dances and demonstrate these to your child

- Teach your child to clean up their environment by singing the “clean up” song and other rhymes
- Use bubbles and pretend play with stuffed animals to encourage your child to interact with others and use their arms
- Help your child explore even more through walks and activities like wagon rides
- Prompt more conversations by asking your child their name and age
- Model kind, gentle behaviors when their child demonstrates negative behaviors
- Encourage more independence in the areas of feeding (drinking from an open cup) and playing (building tall towers on their own)
- Teach your child rhymes, songs, and dances like “Itsy Bitsy Spider”
- Continually praise kids for good behavior and following instructions, limit punishment

Parents of children who are preschool-aged (between 3 and 5 years old) should:

- Let them help with simple chores
- Encourage relationships and activities with other children
- Read to your child and have them help you with certain words, as they are able
- Offer clear, consistent boundaries and discipline in response to bad behavior
- Encourage problem-solving and healthy coping as you help your child work through problems when they are upset
- Assist your child as they speak in full sentences and use appropriate words to describe items, situations, and feelings
- Help your child make decisions by giving them a limited number of choices

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