Allied Therapy

Developmental Norms

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ORAL MOTOR SKILLS AND FEEDING *development*

BIRTH-3 MONTHS	• demonstrates swallow, phasic bite, palmomental, and transverse tongue reflexes • pats a bottle with one or both hands and places hands on bottle during feeding • sucks fingers when near mouth and responds to stimulation in/around mouth • coordinates breath with 2-3 sucks of liquid before swallowing and breathing
3-6 MONTHS	• munching patterns • lateral jaw movement , diagonal jaw movement, lateral tongue movement • opens mouth when food is presented or spoon touches lips
6-8 MONTHS	• scrapes food off a spoon with upper lip and full lip closure emerges • consistent tongue lateralization when foods are presented to sides of the tongue • active movement of foods from side of mouth to central tongue groove and back • diagonal rotary movements • reaches for a spoon and bangs spoon, feeds self crackers
8-10 MONTHS	• circular rotary movements emerge • munching of softer foods, able to transition to slightly more textured food purees • uses fingers to rake food towards self , introduction of cup drinking
10-12 MONTHS	• rotary movements begin to emerge • full transfer of foods from side to side of mouth with tongue • uses fingers to self-feed soft, chopped foods • licking food from lips emerges, simple tongue protrusion may occur • more controlled biting that is isolated from body movements
12-16 MONTHS	• chews and swallows firmer foods without choking • chews foods that produce juice , able to keep food in mouth • holds and tips bottle, holds cup with two hands • sweeps pieces into bolus with tongue
16-24 MONTHS	• chewing strength improves and better able to manage hard-to-chew foods • increasing utensil use, scoops purees and brings to mouth
24-36 MONTHS	• circulatory jaw movement improves and chews with lips closed • open cup drinking without spilling and uses one handed cup holding • increasing fork skills

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FEEDING

Feeding is a complex multi-sensory activity, using all 8 senses. There are many steps to feeding that happen before food even touches the lips, and when the food is in the mouth before being swallowed.

Picky eating, or difficulties with feeding, is not just a developmental stage and requires further evaluation and treatment

STEPS TO EATING

visually tolerate food → interact with food → smells food → touches food → tastes food → eats food

Often a child will need 10-15 exposures to a food before they are willing to take a bite.

Feeding after 6 months of age is a learned skill as reflexes diminish, anatomy changes and awareness develops

FIVE SKILLS TO LEARN TO EAT WELL

1. sensory tolerance and exploration
2. postural stability
3. tongue tip lateralization
4. rotary chewing
5. positive mindset

FLAGS FOR FEEDING ISSUES

- poor weight gain, weight loss
- choking, gagging or coughing while eating
- not accepting sollid foods by 12 months
- not transitioning to a cup by 16 months
- aversion to foods of specific texture or group
- a food range of less than 20 foods
- foods being dropped from repertoire
- child is difficullt for everyone to feed
- unable or unwilling to sit while eating
- consistent drooling

TREATMENT

Anxiety decreases appetite so it is important to remember that feeding is a process. Keep the atmosphere calm so that the child knows it is OK to explore new foods before putting them in their mouths. Anxiety can cause a child to react, rather than learn.

Physical challenges and skill deficits are often the major causes of feeding difficulties, with the environment becoming a factor in whether these issues get better or worse.
An occupational therapist and speech language pathologist can complete a full feeding assessment of the child and environment to determine causes of feeding challenges and develop an intervention plan.

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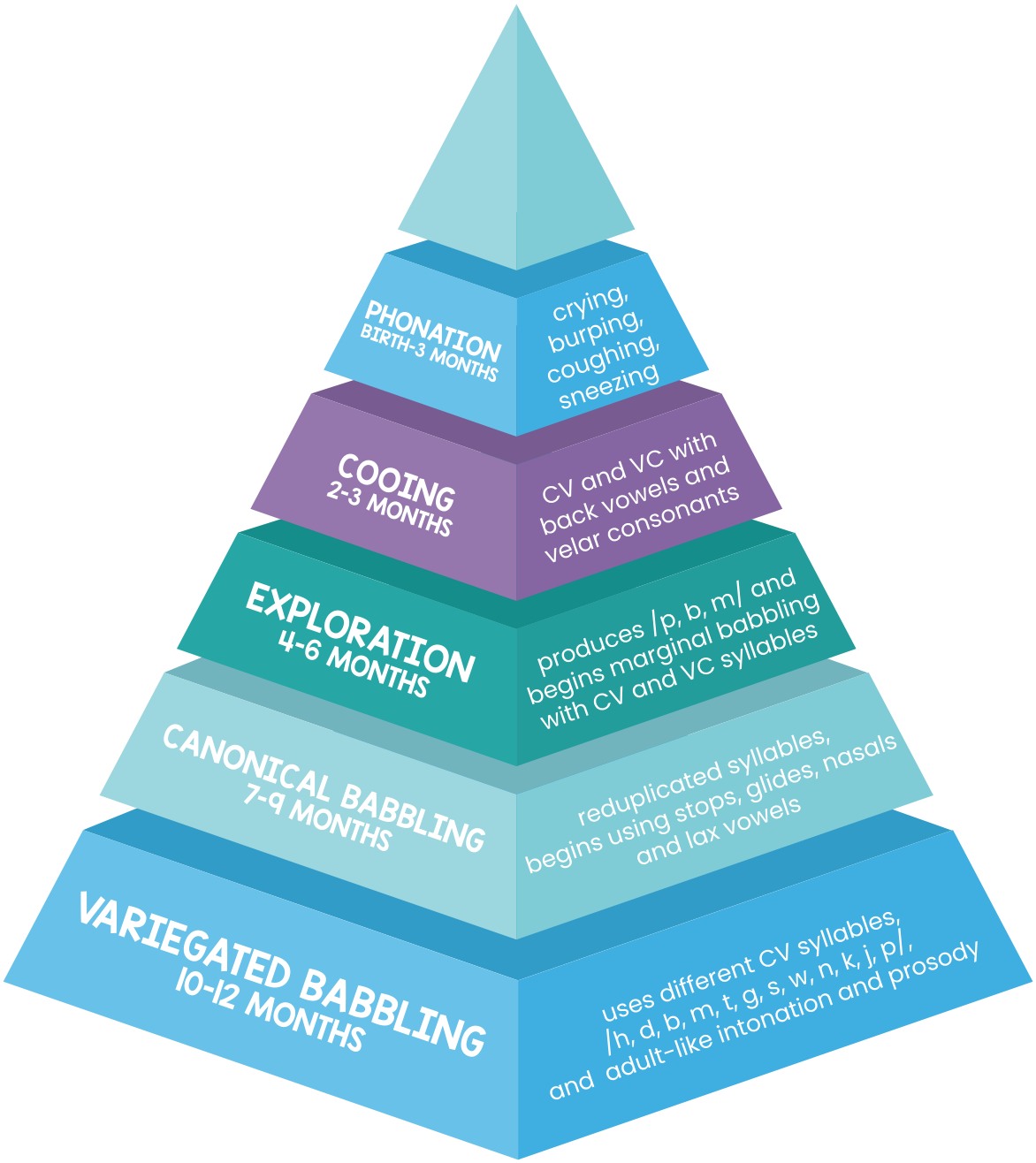
PRE-LINGUISTIC *development*



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EXPRESSIVE VOCABULARY *development*

OLDER CHILDREN

42 months	1200 words
48 months	1,600 words
54 months	1,900 words
60 months	2,200-2,500 words
6 years	2,600-7,000 words
12 years	50,000 words

Based upon averages, or what 50% of children produce at each age.

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LISTENING SKILLS *development*

1-2 YEARS

- follows one-step directions with cues
- understands simple questions: "Where's mommy?"
- points to named pictures in a book
- follows directions to find two familiar objects
- listens to simple stories

2-3 YEARS

- follows directions involving body parts
- follows two-step directions
- follows directions that include action + adverb or action + adjectives: "give me the blue car" or "walk slowly"
- demonstrates understanding of several verbs by selecting corresponding pictures
- recognizes family labels such as grandpa or baby

3-4 YEARS

- attends to their name being called from another room
- understands simple wh- questions
- understands simple questions related to their activities and environments
- improves listening skills and begins to learn from listening

4-5 YEARS

- attends to short stories and answers simple questions
- hears and understands most of what is said at home and school
- repeats four digits when they are given slowly
- readily follows simple commands about remote objects

5-6 YEARS

- repeats sentences up to nine words in length
- follows three-step directions
- responds correctly to more types of sentences but may still be confused at times by more complex sentences

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MOTOR MILESTONES

The following developmental milestones indicate a child is developing as expected. In each age category, skills are listed in typical order of development (earlier developing skills listed first)

	Fine Motor	Visual Motor	Gross Motor
1 year	• Uses a pincer grasp to pick up small items • Crumples paper with palm 	• Reaches and grasps items, with a controlled release • Brings toys to play at middle of body • Transfers objects between hands • Places objects in container • Stacks 2 blocks • Turns pages of a book, a few pages at a time	• Walks with one hand held • Stands alone for a few seconds
2 years	• Uses a fisted grasp with a marker • Picks up and holds two cubes 	• Spontaneously scribbles • Places shapes into correct spots in simple puzzle • Stacks 4-6 blocks • Turns 3 pages of a book, one at a time • Imitates a vertical line when drawing • Snips paper with child safe scissors	• Picks up object from floor without falling • Squats to play • Runs without falling • Walks into ball when trying to kick, lifting one foot momentarily • Throws ball overhand without falling
3 years	• Uses a digital pronate grasp with a marker • Removes screw/twist on lids from containers 	• Strings 2-4 large beads • Bends paper, producing a crease • Builds a 10 block tower • Copies block designs with 3-4 blocks • Cuts paper into two pieces • Copies vertical and horizontal lines, and a circle when drawing. Imitates a cross.	• Jumps in one place • Momentary balance on one foot • Balances on tip toe • Alternates arms and feet in run • Kicks ball with force • Catches 9" ball with extended arms • Rides a tricycle
4 years	• Uses a tripod or quadrupod grasp with a marker • Can do and undo 3 buttons 	• Laces 3 holes • Controlled cut on a line • Copies lines, circle, cross and square • Traces a line with accuracy • Connects dots by drawing a straight line • Builds simple block designs with a visual model	• Runs and jumps • Balances 2-7 seconds on one foot • Hops on preferred foot • Walks and runs on tip toe • Catches ball at chest • Begins somersaults
5 years	• Uses a dynamic tripod grasp - movement coming from the fingers rather than the arm • Touches each finger to thumb 	• Copies lines, circle, cross, square and triangle • Cuts out circle and square • Colours between lines with accuracy • Folds paper with edges meeting • Prints own name	• Stands steadily on one foot for 10 seconds • Imitates body positions/movements with accuracy • Jumps over object • Skips, alternating feet • Catches a bounced ball • Rides a bicycle with or without training wheels

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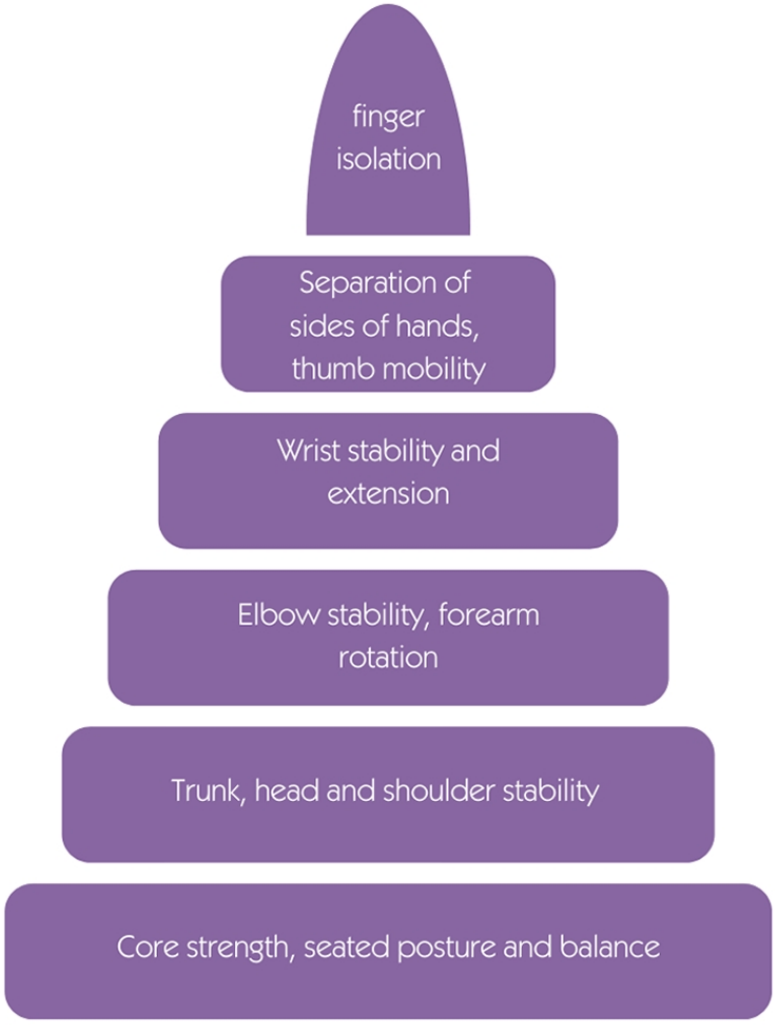
Based on: Peadbody Developmental Motor Scales, Beery Developmental Test of Visual Motor Integration, Gesell Stages of Development, Erhardt Hand Development

FINE MOTOR

Fine motor skills are the use of small muscles of the fingers, hands and wrists to complete small, efficient and coordinated movements. These movements are usually coordinated with the eyes.

Strength and coordination of the small muscles are an important part of fine motor development, however it is actually one of the later steps in improving fine motor skills. Larger muscle strength and stability are required before we even begin to consider the hands

Strength develops proximal to distal, or inside - out. We start at the bottom of the pyramid and move to the top. We cannot expect strong fine motor skills from children who do not have a strong base of support!



Fine motor skills are essential for the completion of various daily tasks with independence and begin at a very young age. These skills are extremely important for independently engaging in activities of daily life, such as dressing, feeding, writing and drawing. We use fine motor skills all the time!

Some children who struggle with these skills, and ongoing difficulty with fine motor skills can affect academic skills and self-care skills.

GROSS MOTOR

Gross motor skill development involves the large muscles in the arms, legs and torso. Gross motor activities are required to complete daily physical activities like walking, running, throwing, kicking, climbing and more. Gross motor skills are the basis for fine motor skills and relate to body awareness, reaction speed, balance and strength.

A STRONG BASE OF SUPPORT FOR SKILL DEVELOPMENT

Core strength involves the torso muscles that align and move the trunk of the body, and provide stabilization.
Poor core strength is often the contributor to poor development of motor skills. Building a strong core is like building a strong foundation for skills to develop

Fine motor skills are developed from gross motor skills. Children need to develop trunk and shoulder muscles in order to use the hand and fingers. These core muscles develop in gross motor movements such as tummy time, crawling, standing and walking

SIGNS OF CORE AND SHOULDER WEAKNESS

- Lifting shoulders up towards ears or keeping elbows tucked into body during activities.
- Slouching and leaning against people and furniture
- W sitting position
- Holding their head up with hands
- Frequently losing balance
- Poor attention

COMMON GROSS MOTOR CHALLENGES

Sitting still is actually a complex and high level skill. To sit still, a child must have the strength and stability to hold the body against gravity, avoid impulses, ignore distractions and focus on a (sometimes) challenging task.

Poor posture can lead to increased strain on the body, leading to fatigue over time, and stiffness and pain in the muscles and joints. Good sitting posture supports the work of hands, eyes, ears and brains for learning!

Avoidance, disinterest, or rushing through physical tasks

Poor coordination, often tripping or falling.

Difficulty crossing midline of body.

An occupational therapist or physiotherapist can assess a child's gross motor abilities and recommend appropriate intervention

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VISUAL PERCEPTION

Visual perception is the way the brain interprets information that the eyes receive. It is important for learning to read and write, as well as the development of gross motor skills . Visual perceptual skills are used constantly to determine where you, and items around you, are in relation to the environment.

Visual perception helps with:

- Judging distances
- Learning letter formation, how to read, writing sentences and copying from afar
- Finding things in your environment
- Remembering the sequence of letters and numbers in a sentence.

AREAS OF VISUAL PERCEPTION

Visual Discrimination	the ability to differentiate between letters, numbers, and shapes that might appear similar
Visual Memory	the ability to recall in the short-term, something that they have seen
Spatial Relations	the ability to perceive the relative positions of objects
Form Constancy	the ability to recognize shapes despite changes in orientation and size
Visual-Sequential Memory	the ability to remember and correctly sequence shapes
Figure Ground	the ability to identify an object from a busy background or surrounding objects.
Visual Closure	the ability to identify a whole figure when only parts are visible.

Children require adequate visual perceptual skills to function optimally at home and school. If visually presented information is not correctly perceived, the muscles recieve incorrect signals resulting in an inappropriate motor response.

Difficulties in visual perception can lead to motor, academic and social-emotional challenges.

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SENSORY PROCESSING

Sensory processing refers to the way the nervous system recieves information from the senses and turns these messages into motor and behavioural responses. In order to successfully complete any activity, processing of many different sensations is required.




THE 8 SENSES

Taste
Sight
Smell
Hearing
Touch

Proprioception - awareness of body position and strength to complete tasks
Vestibular - sense of balance and body orientation
Interoception - awareness of internal sensations




CHALLENGES IN SENSORY PROCESSING

Sensory processing difficulties are not an obvious challenge. These children are often labeled clumsy, uncooperative, hyper, out of control, lazy or disruptive.

Individuals with sensory processing challenges may have difficulties with one sense, such as touch, or with multiple senses. Challenges can be in over or under responding to input.

Example: A child who is under responding to input from the muscles and joints will typically present with poor posture and motor skills. As a result, this child may develop poor self-esteem, struggle academically and exhibit poor social-emotional skills due to their inability to "keep up" with peers.

It is difficult to process and act upon information recieved from the senses if these sensory signals cannot organize themselves into appropriate responses. This can create severe challenges in the completion of everyday tasks.

TREATMENT

Through therapy with an Occupational Therapist, with a sensory approach, a child with sensory processing difficulties learns alternate ways to process challenging information, and discover leisure and vocational activities to best suit their processing needs.

Challenges in sensory processing are often misdiagnosed as ADHD, and these children typically begin a medication regimen that is not meeting their needs.

There are striking parallels between the two, however there are also disparities. It is best to consult therapists who are knowledgable with both sensory processing and ADHD.

If treatment is not received, these challenges can lead to clumsiness, behavioural problems, anxiety or depression.

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SENSORY PROCESSING FLAGS

The following are indicators that a child is seeking or avoiding input. If a child is demonstrating any of these behaviours, they will benefit from a sensory assessment to best determine how to support their needs

This is is intended as a guide to identifying challenges in sensory processing, this is not a diagnostic tool

- Slouching, leaning against furniture and people, is generally "floppy" with poor posture
- Uses excessive force to complete tasks
- Consistently has meltdowns or is distressed in busy environments
- Refuses or cries when laid on their back
- Frequently spinning and doesn't seem to get dizzy
- Throws items without aim or intent, watching the item
- Particular about clothes, such as only wearing certain textures, tight clothing, distressed by tags etc.
- Seeks hugs, preferred to be squeezed into tight spots
- Avoids movement, appears lazy or fearful
- Gags at sight, taste or smell of foods
- Consistently or frequently walks on toes
- Generally clumsy - dropping items, bumping into objects and people
- Difficulty with toilet training, despite multiple approaches
- Not aware of need to use bathroom, or when hungry/thirsty
- Refuses or prefers to be barefoot

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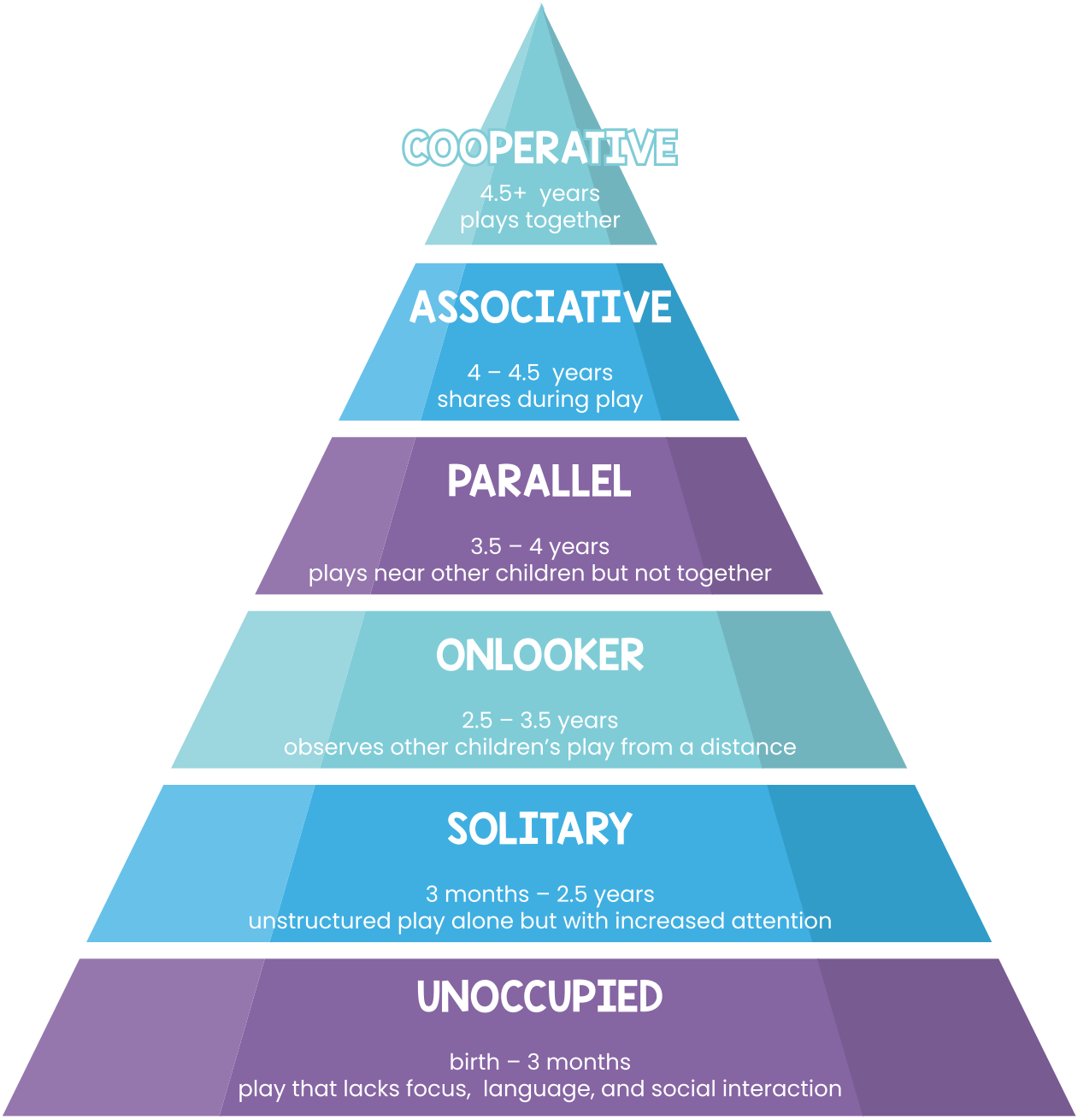
SOCIAL PLAY SKILLS
hierarchy



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SOCIAL COMMUNICATION *development*

1-2 YEARS

- follows simple directions with a gestural cue
- says "bye" and other social words, such as "hi" and "please"
- indicates wet pants
- repeats actions that made someone laugh
- talks to self during play and refers to self by name
- pairs gestures with words to make wants known
- exhibits verbal turn-taking and engages in simple pretend play
- protests by vocalizing "no" and practices intonation

2-3 YEARS

- requests permission for items or activities
- begins to tell jokes and tease
- makes conversational repairs when needed
- engages in longer dialogues
- begins to participate in simple make-believe and group activities
- begins to control behavior verbally rather than physically
- holds up fingers to tell age
- helps put things away

3-4 YEARS

- follows 2-step related directions without cues
- takes turns and begins dramatic play
- relates personal experiences through verbalization
- shows frustration if not understood, expresses ideas and feelings
- separates from primary caregiver easily
- frequently practices conversation skills by talking to self

4-5 YEARS

- follows 3-step directions without cues
- uses requests with justification: "Stop that. You're hurting me."
- uses words to invite others to play and to resolve disputes
- plays competitive exercise games
- has good control of the elements of conversation
- speaks of imaginary conditions, such as "What if..." or "I hope..."

5-6 YEARS

- uses threats and promises
- asks meaning of words and asks questions for information
- likes to complete projects and makes purchases at stores
- chooses their own friends
- takes more care in communicating with unfamiliar people
- engages in cooperative play, such as making group decisions, assigning roles, and playing fairly
- announces topic shifts

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EXECUTIVE FUNCTIONING *in children*

2-3 YEARS

- demonstrates knowledge of rules but is unable to alter behaviors
- unable to delay gratification

3-4 YEARS

- increased attention, self-control, and inhibition
- occasional perseverative behaviors
- incremental improvements in verbal fluency
- improvements in processing speed and accuracy on impulse control tasks
- demonstrates knowledge of rules and emerging ability to shift behaviors
- completes simple tasks, such as getting shoes or cleaning room
- inhibits behaviors: "don't bite" or "we share toys"

4-5 YEARS

- able to process 2-3 units of information
- demonstrates ability to shift between two simple task requirements
- increased mental flexibility and rapid switching between two simple response sets
- capable of generating new concepts and ideas

5-6 YEARS

- able to process up to five steps in a simple problem-solving task
- decline in uncontrolled repetition or continuation of a response without rationale for the behavior
- emerging ability to learn from mistakes and create alternatives
- begins to delay immediate gratification, able to wait for a "better" reward
- simple strategic planning skills emerge

6-8 YEARS

- selective attention begins to develop and mature
- demonstrates more frequent strategic and planned choices and behaviors

8-9 YEARS

- increased flexibility switching between rules or changing demands
- performs chores that take up to 15-20 minutes
- remembers to perform a planned task in the future
- saves money for desired items
- self-regulates actions and behaviors
- plans simple school projects and keeps track of own belongings

9-12 YEARS

- improvement in the ability to inhibit impulsive actions
- matures in ability to attend to tasks even when presented with distractions
- able to monitor and regulate actions and learn from mistakes
- ability to switch between multiple task demands
- rapid surge in planning and organizational skills

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TOILETING

The entire developmental progression for toileting spans years, from birth up to about 8 years of age. Toileting affects a child's function and self-esteem as it has many social implications. Identifying readiness signs and establishing a routine that meets the child's needs are important for success in toileting.

READINESS SIGNS FOR TOILETING

A child is typically ready to beigin the toilet training process when they begin showing these signs:

- Understands simple directions (for example, "pick up your shoe")
- Shows an interest in the potty / toilet
- Imitates adult behaviors (such as brushing teeth, combing hair, sitting on potty)
- Willing to sit on a potty or toilet for 1-2 minutes
- Stays dry for about 2 hours at a time
- Shows an awareness of having just urinnated or had a bowel movement (such as pulling at diaper or vocalizing)
- Has the physical ability to push down/ pull up their pants or indicate the need for assistance to do this

Toileting is a life skill that requires learning multiple steps before a child can be successful on their own. Before they can successfully use the toilet, they first learn to follow a bathroom routine, manage their clothing, sit for short periods of time, flush and wash their hands.

SENSORY CHALLENGES IN TOILET TRAINING

Toileting is a sensory experience, and typically children with ongoing issues with toilet training are struggling with their sensory system during this challenging task.

Interoception is the perception of sensations inside the body – such as knowing when you are hungry, thirsty, or need to go to the bathroom. Children who struggle with interoception may not be aware of the need to use the bathroom before it is too late, resulting in accidents.

Refusals to use the toilet can often be the result of an uncomfortable/unfamiliar sensation when a bowel movement or urine leaves the body, leaving children feeling empty or out of control.

Toilet training can be a stressor for some children for various reasons. It is important that these children approach this stressor with a calm body. Learning and routine will develop when they are regulated and feeling safe.

There are various reasons for challenges in toilet training, and it is best to consult with an occupational therapist for an assessment of the child's needs and challenges and to discuss appropriate intervention strategies.

Koscinski, C. N. (2018). Interoception: How I feel: Sensing my world from the inside out. Cara Koscinski.

SLEEP

Sleep is critical for both physical and mental health, and children thrive when they get the proper amount of sleep they need every day. A lack of sleep can have a big impact of physical and mental health, and behaviour.

WHY SLEEP IS IMPORTANT?

Research shows that children who recieve adequate sleep:

- achieve higher grade averages
- achieve higher reading scores
- have improved social skills
- have improved focus
- are less likely to be overweight
- have improved physical and mental health

SIGNS OF NOT ENOUGH SLEEP

- not waking on own in the morning
- general irritability and poor mood regulation
- decreased social skills
- decreased focus
- anxious and uncooperative in the morning
- complaining of stomach and head aches
- hyperactivity and impulsiveness
- falling asleep during the day

HOW MUCH SLEEP DO CHILDREN NEED?

AGE	HOURS
4 -12 months	12 - 16
1 -2 years	11 - 14
3 - 5 years	10 - 13
6 - 12 years	9 - 11
13-18 years	8 - 10

CHALLENGES WITH SLEEP

Sensory processing - a child can be overwhelmed by light, noise, tactile input from pyjamas or the temperature in the room

Anxiety can prevent a child from falling asleep, or returning to sleep

Behaviour challenges - refuses bedtime routine, requests or needs that delay bedtime

Physical concerns - night time growing pains, frequent toileting during the night, and waking during the night

Schedule or routine - when a bedtime schedule varies by 30-60 minutes or more it is harder for children to fall and stay asleep

An occupational therapist can evaluate the above challenges with sleep and recommend appropriate intervention

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TOE WALKING

Toe walking is when a child walks on their toes, or on the ball of their foot, without the heel coming in contact with the floor. It is not a typical gait.

Toe walking can have a negative impact on gross motor development and may be a sign of other underlying conditions.

WHAT CAN CAUSE TOE WALKING?

A Poor Vestibular System

The vestibular system is in the inner ear and responsible for providing the brain with information on movement and position of the body. When this system is not functioning well, it does not provide the brain with the correct information and therefore may not be aware that the feet are not walking in a typical pattern

Sensory Processing

If a child is sensitive to touch, placing their heels on the floor may be overwhelming and uncomfortable.To avoid feeling uncomfortable, they may walk on their toes. Typically these children will show aversions to other tacitle input such as socks and shoes

Habit

If a child has spent some time walking on their toes, they may continue to do so out of habit, and that it is familiar

TREATMENT

A child who presents with toe walking may require further care from a specialist. If left untreated, toe walking can lead to:

- Limited or no ability to jump
- Decreased balance and movement
- Difficulty using stairs
- Difficulty stopping from a run

Early identification and intervention can help prevent the need for more invasive treatments. Prolonged toe walking can result in shortening of the calf muscles and heel cord (Achilles tendon)

While toe walking may resolve on its own, it is beneficial to discuss appropriate intervention strategies with an occupational therapist and/or physiotherapist as soon as it is observed.

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STUTTERING *information*

HOW TO DISTINGUISH A DEVELOPMENTAL STUTTER FROM A PERSISTENT STUTTER

WAIT, BUT MONITOR

0-6 MONTHS

If a child has been stuttering for less than 6 months, it may resolve on its own.

CONSIDER OTHER FACTORS

6-12 MONTHS

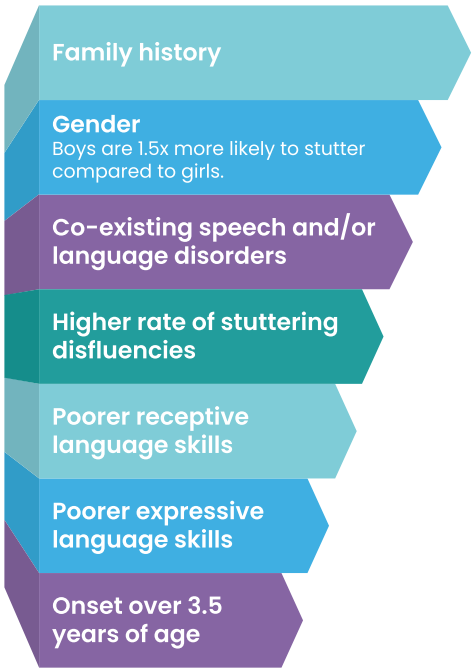
If a child has been stuttering for 6-12 months and displays risk factors, therapy may be warranted.

THERAPY WARRANTED

12+ MONTHS

If a child has been stuttering for 12+ months, therapy may be warranted.

RISK FACTORS FROM GREATEST TO LEAST



TYPES OF DISFLUENCIES

- Part-word repetitions: "I **w-w-w-**want that."
- One-syllable word repetitions: "**Go-go-go** away."
- Prolonged sounds: "**Sssssss**stop that."
- Blocks or stops: "I want a **(pause)** turn."

TYPICAL DISFLUENCIES THAT ARE LESS INDICATIVE OF A STUTTER

- Adding an interjection: "I **um** want that."
- Repeating phrases: "**We're going, we're going** now."
- Revision, or changing the words in a sentence: "**I had–I lost** my tooth."
- Not finishing a thought: "**His name is** . . . I can't remember."

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