

A Case Study on a School-Based Intervention for Autism; Emily's Story

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### **Areas of Occupation**

*Activities of Daily Living.* Emily, a first grader with autism, requires assistance with most activities of daily living (ADLs), as well as several other areas of occupation. Emily lives in a one-story home with her mother, father, and one-year old brother. Emily's mother is heavily involved in her daily home routines, including getting ready for school, eating meals, and bedtime routines. From the time she attended preschool, Emily has worked with a school-based occupational therapist on educational-based activities, self-care, and emotional regulation.

Emily's mother provides direction with self-care activities including dressing, bathing, and personal hygiene, as she has difficulty completing all elements of these tasks independently. Emily currently wears pull-up diapers as a result of an under-responsive visceral system, which prevents Emily from anticipating when she needs to go to the bathroom. In the past year, Emily has learned to communicate to her mother when she has a soiled diaper, which has improved the quality of both of their lives. Emily is only willing to brush her teeth after her mother provides prompting, by way of applying toothpaste to the toothbrush, and initiating the first few brush strokes using a hand over hand technique. Similarly, with dressing and washing, Emily's mother will provide moderate assistance with various elements of the task, such as pulling up her pants or washing her hair.

Emily consistently communicates her basic needs through three word sentences, such as "I want juice" or "good night please". Her mother reports an echolalia where Emily will repeat what is said around her, without knowing the meaning of the words she is saying.

*Instrumental Activities of Daily Living.* In addition to Emily's participation in several ADLs, she is becoming increasingly involved in certain instrumental activities of daily living (IADLs). Emily enjoys going to the grocery store with her mother, picking out snacks and cereal while walking down the aisles, and will carry light grocery bags from the car into the house.

*Sleep.* At nighttime, Emily's mother locks her bedroom door, as she is fearful she might cause harm to herself by turning on the stove or running away. Emily does not fully recognize the danger of moving cars, fire, swimming pools, and strangers. Though Emily sleeps ten hours nightly, she fatigues easily throughout the day due to low muscle tone.

*Education.* Emily qualifies for an individualized education program (IEP), and is currently attending a special education classroom. Specific classes promote inclusion in that Emily's class participates in general education. During school hours, Emily participates in formal education, recess, and lunchtime with her classmates. As a first grader, she is learning letters, colors, days of the week, time, basic math, and shapes. Although Emily is able to write her name, her handwriting is mostly illegible. Emily uses scissors to cut paper, however, does not know when to stop cutting once the activity is completed. Additionally, Emily recognizes all alphabet letters, ten colors and spelled color words, and two days of the week. She has learned to tell time to the hour, can count up to 25 objects, and identifies ten sight words from her reading program. Her IEP addresses benchmarks for handwriting legibility, along with the ability to count at least 50 objects, understanding the concept of seven days of the week, and increasing ability to communicate through either pictures, words, or sign language, as well as maintaining personal hygiene.

*Play.* Emily enjoys playing computer games at home and school, as well as completing simple puzzles. Although she sometimes watches her fellow classmates, she does not participate in social activities. Emily's knowledge of the alphabet transfers to her home setting where she plays with alphabet magnets and blocks. She interacts with her immediate family, however, tends to act out when grandparents or other family members visit. Emily's mother wants to plan a vacation, but is concerned that Emily will act out when in an unfamiliar environment.

**Movements, Postural Reactions, and Reflexes**

When standing, Emily exhibits a forward tilt of her head, shoulders, and pelvis, which results in a slight lumbar lordosis and locking of the knees. During class, Emily often sways back and forth while looking around the room.

Emily's under-responsive proprioceptive system, along with low muscle tone, causes her to exaggerate many of her movements when doing jumping jacks or running during recess. She often runs into objects, or falls out of her chair due to her lack of body awareness. Furthermore, Emily's difficulty with crossing midline likely contributes to her difficulty advancing in writing, reading, physical activity, and self-care activities.

**Sensory Integration and Sensory Regulation Concerns**

Emily has several sensory integration and self-regulation issues that affect her performance in school, as well as at home. She has a decrease in sensory modulation and discrimination, which affect her ability to organize sensory input; therefore, she has trouble judging the intensity and nature of sensations for functional use. Even though Emily is hyper-responsive to certain sensations, such as light touch, she is hypo-responsive to vestibular, tactile, and proprioceptive sensations. For example, Emily enjoys being tickled, squeezed, and receiving deep pressure brushing, as these sensations provide Emily with the proprioceptive input she needs. Additionally, Emily frequently self-stimulates by scratching foam alphabet letters or puzzle pieces against her skin to calm herself, by rocking from side to side in her chair, or flapping her arms rapidly.

**Assessments**

Due to high reliability and validity, the School Function Assessment would be beneficial in evaluating Emily's functional abilities in the school setting. A composite of school personal

who are familiar with the Emily's progress in an academic setting complete several items listed under social participation, activity performance, and task supports. School personal involved in this assessment may include regular and special education teachers, school-based occupational therapists, speech language pathologists, and any other professional who is familiar with Emily. Items included in the School Function Assessment address how Emily functions in regards to various classroom tasks, recess, safety, hygiene, and transitioning between activities and settings. In administering the School Function Assessment, areas in which Emily demonstrates weakness or strength are identified, thereby helping establish school-based treatment goals.

In addition to the School Function Assessment, the Sensory Processing Measure is appropriate to use in a classroom setting while assessing possible sensory processing disorders. It is important to note that the forms for the main classroom and school environment should be used in a school-setting. The Sensory Processing Measure addresses social participation, any sensory impairments, planning, and ideation. Settings covered in this assessment are art class, music class, recess, physical education, cafeteria, and the school bus. Like the School Function Assessment, the Sensory Processing Measure should be completed by any school personal who knows Emily well. The Sensory Processing Measure is commonly used to devise a treatment plan for children with sensory processing disorders in a school setting. The Sensory Profile can be used in conjunction with the Sensory Processing Measure as it identifies areas in which Emily is experiencing difficulties, and therefore requires an intervention strategy.

### **Problem Statements**

1. Emily is unable to use functional pencil grasps due to poor postural control and low tone.
2. Emily requires moderate assistance in dressing due to poor body awareness and a hypo-responsive vestibular system.

3. Emily has the inability to imitate novel movements due to sequencing dyspraxia.
4. Emily demonstrates emotional outbursts when presented with novel activities due to sensory avoidance.
5. Emily requires maximum verbal cueing for required tasks due lack of communication and social awareness.

### **Family Goals**

1. Emily's mother would like to see her become more independent with dressing and personal hygiene.
2. Emily's parents want her to be happy at school and develop friendships with classmates.
3. Emily's parents want her to participate and enjoy an upcoming family trip to Disney Land.
4. Emily's family would like her to transition from activities in an appropriate manner. She draws a lot of attention to herself when she is out with her family by screaming and dragging herself.
5. Emily's parents want her to be safe and have her recognize the dangers in her environment. She shows no hesitation running towards moving vehicles.

### **COAST Goals**

1. Emily will use the toilet with moderate verbal cueing and supervision 2 out of 3 times before the end of the school year.

**Objective 1a:** Emily will pull up her pants after using the bathroom independently 2 out of 3 times by March 10, 2013.

*Activity 1:* Due to her hypo-responsive vestibular system, Emily has trouble bending over or lifting her legs to put pants on, as these motions can easily disrupt her balance. In order to expand her comfort with different body movements and

positions, Emily will bend down to retrieve bean bags from the floor. This will help Emily adapt to different body positions in order to help her balance. The bean bag activity will supplement the new skills she is learning in math, such as addition. For example, three bean bags have been placed in a bucket, and Emily will count these three aloud. Then Emily will be told to pick up any additional bean bags off the floor and place them in the bucket. She will then be asked “ $3+1=$  how many?” Emily will be prompted to count the new number of beanbags in order to solve this addition problem. With enough practice Emily will become familiar with basic addition equations, and will not need to count the bean bags.

*Activity 2:* Emily’s low tone and poor body awareness cause certain activities, such as pulling up her pants, to be difficult to complete. To improve her muscle strength and body awareness, Emily will sit on a small yoga ball while doing handwriting activities during class time. Sitting on small, unstable surface will strengthen Emily’s core muscles, which is necessary before strengthening her extremities. Building core strength will increase Emily’s visceral awareness, which currently inhibits her from realizing when she needs to go the bathroom. When using yoga ball with Emily, adult supervision is required at all times.

*Activity 3:* Emily will participate in a yoga program that has her mimic the movements of jungle animals. In this version of animal yoga, Emily will be presented with a card containing a picture of an animal, and she will need to position herself to imitate the animal’s movement. The occupational therapist, or teacher, can perform this movement to provide Emily with visual cueing. She will hold this position for ten seconds. In total, she will complete five animal

cards. This activity will not only help strengthen the core muscles needed for toileting, but will require Emily to organize her thoughts through vestibular input.

**Objective 1b:** Emily will wash her hands with moderate assistance, using soap for 30 seconds, 3 out of 4 times by April 1, 2013.

*Activity 1:* Emily experiences tactile defensiveness, which causes her to receive more intense input when handling soap, and adjusting to the temperature of the water. Emily will experiment with different scents, textures, and types of soaps to decide which soap she not only tolerates, but enjoys using. Next, Emily will practice the motions of hand washing, and will be guided in determining a good water temperature for her to use. Addressing these sensory issues will not only allow Emily to tolerate hand washing, but will create a positive experience while doing so.

*Activity 2:* Emily will use bath letters to spell words in a small bin of warm water. This will help her to acclimate to the temperature of the water she will wash her hands with. Emily exhibits tactile defensiveness towards water, which makes this important hygiene activity difficult to complete.

*Activity 3:* Emily exhibits poor bilateral skills, uncoordinated movements, and inability to sequence multi-step tasks, making it difficult to complete healthy personal hygiene habits, such as washing hands after going to the bathroom. Furthermore, Emily becomes impatient washing her hands for more than ten seconds. Emily will practice washing her hands, while counting to 30 aloud, which will provide her with a distraction. Currently, Emily is only able count up to 25, however, she demonstrates interest in learning to count to higher numbers.



2. Emily will participate, with minimal prompting, in five activities that require social interaction with classmates without exhibiting an emotional outburst by school year end.

**Objective 2a:** Emily will tolerate sitting next to a classmate given moderate verbal cueing while engaging in her own play activity for 10 minutes by March 10, 2013.

*Activity 1:* During the half hour of free time in class, Emily's typical routine is to pick a puzzle and piece it together in the corner of the classroom. To begin developing social participation skills, Emily will sit at the same table as one of her classmates while she completes a puzzle of her choice. The other student will engage in a different activity that does not involve Emily. By sitting in close proximity to her classmate, Emily will begin to acclimate to this variance in her routine. This parallel play-type activity will promote Emily's ability to adapt to new routines that involve increasing levels of social participation.

*Activity 2:* Emily will play Connect Four, a two-player game, with a classmate. As two people are required to play this game, Emily will need to exhibit patience as she waits for her turn to play. However, turns in this game are short, and Emily will slowly get used to sharing the game and politely saying "My turn" at the correct time. On the Connect Four coins will be stickers of sight words that Emily will say before inserting the coin through the board. This will increase Emily's knowledge of sight words, as she currently recognizes ten words. This is in addition to the normal process of Connect Four, which is to achieve a row of four coins, which will require Emily to recognize a vertical, horizontal, or diagonal line.

**Objective 2b:** Emily will calm herself when introduced to new activities during class with minimal cueing, by May 1, 2013.

*Activity 1:* Emily will pin picture cards that represent her daily school activities on a colorful chart. This will allow Emily increased time to process the activities she will engage in, as well as provide predictability in her daily schedule. Emily's cards will include pictures of the toilet, puzzles, lunchtime, or the school bus.

*Activity 2:* Emily's first grade class will attend gym class in the school's gymnasium for the first time. Though Emily attends a special education classroom for most of the day, this is an opportunity to be mainstreamed into the general education gym class. Emily will participate in a new activity, parachute, in which she will stand next to her classmates to move and shake the parachute. Though Emily will need to cooperate with her classmates for this activity, she is not required to take turns or share, which she has trouble with. However, she will need to demonstrate emotional regulation while participating in a new activity, in a new environment.

3. Emily will independently write her name using correct spacing and letter size on primary paper, 3 out of 4 times by the end of the school year.

**Objective 3a:** Emily will independently hold a pencil in a static tripod grasp, with a grotto grip to write 3 letter words by April 1, 2013.

*Activity 1:* Emily will reach for heavy books on an above-shoulder height shelf, and place them on the floor. Emily will then carry the books to her table, and will stack them alphabetically according to the first letter in the title. Afterwards, Emily will carry the books back to the shelf and place them in their original spots.

This activity builds Emily's upper extremity strength, which is necessary before working on her tripod grasp.

*Activity 2:* Emily will practice using three different types of tongs to drop erasers into a container. The different types of tongs that will be used are animal tongs, salad tongs, and small metal tongs with more resistance. She will then transfer small animal erasers into different containers according to where the animal lives. For example, Emily will place the animals that live in water in one cup, while placing animals that live in the jungle in another cup. This activity will increase the hand strength that is necessary to refine Emily's fine motor skills.

**Objective 3b:** Emily will independently write the alphabet within boxes that are 1/4 inch spaced using a pencil on primary paper, 2 out of 3 times by April 25, 2013.

*Activity 1:* Emily will use the Handwriting Without Tears "Wet Dry Try" activity on a double lined chalk board. First, Emily will write a word, then erase it using a wet sponge in the motion she used when originally writing the word. Afterwards, she is prompted to take a paper towel and trace over the areas where the word used to be in order to dry it. This will promote Emily to practice forming the word three times in different ways.

*Activity 2:* Emily will learn to play Hangman, a game that requires guessing letters of a word, and writing the correct letters in boxes. Boxes that are 1/2 inch apart will be drawn on the whiteboard, and when Emily guesses letters that are part of the mystery word, she will write the letter in one of the boxes. Some of words used in Hangman will be the new sight words Emily learned during the

Connect Four activity. This game helps Emily work on proper letter formation, size and spacing.

*Activity 3:* Emily will write 3 letter words with a carrot dipped in ranch dressing on paper plates. Boxes of different sizes will be already drawn on the paper plates so that Emily will practice letter formation, sizing, and spacing. Emily will practice upper and lowercase letters during this activity. In addition to working on handwriting, this promotes a fun activity involving healthy food choices. After Emily completes three words, she will be allowed to eat the carrot.

### **Environmental Setting**

Emily attends a secluded, special education classroom with some mainstreaming in physical education class, recess, and lunchtime. Direct therapy will be provided by the school-based occupational therapist in the classroom in areas of self-care, social participation, emotional regulation, and handwriting. After consultation, some treatment activities can be performed by the special education teacher or teacher's aide. This indirect therapy is necessary, as the occupational therapist is only with Emily one hour a week.

### **SOAP Note**

***Subjective:*** Emily appeared anxious as the beginning of the tx session. When asked to do the handwriting task, Emily stomped her feet and cried. Emily remained visibly upset for 10 minutes.

***Objective:*** Emily participated in a 60-minute OT session at school which focused on improving her handwriting, letter formation, and using the static tripod grasp. Emily demonstrated a right gross hand grasp. Emily was able to follow instructions 2 out of 5 attempts when asked to write the letters of her name. She demonstrated poor handwriting legibility with decreased letter

formation, as well as problems with sizing, spacing, and alignment. 3 out of 5 letters of her name appeared legible. Emily needed cueing to stabilize her paper 2 out of 5 times. During the activity of Hangman, Emily correctly wrote 2 out of 3 letters in allotted boxes.

**Assessment:** Emily has difficulty with transitions and emotional regulation. Due to poor postural control and low muscle tone, Emily uses a gross hand grasp for handwriting. Emily demonstrates progress as she requires less verbal cueing than at the beginning of the school year. Potential to improve in handwriting and emotional regulation. Emily will benefit from continued skilled OT services to increase letter formation, word spacing, letter sizing, and alignment using a tripod grasp.

**Plan:** Continue to treat Emily 60 minutes 1/wk. for the remainder of the school year to address problems with hand-writing. Plan to address letter spacing, alignment, spacing, and sizing. Plan to address emotional regulation by setting up a daily picture schedule and gradually increasing social participation activities to her adapt to the classroom setting.

### **Specific Recommendations**

A daily picture schedule is recommended to Emily's special education teacher in order to help establish routines. A separate picture schedule for use at home, which includes cards for brushing teeth, mealtime, and bedtime would be beneficial, as well. Additionally, the occupational therapist will suggest to the teacher that Emily's family goes over handwriting homework with her at least twice a week.

Emily's teacher will be encouraged to keep a notebook of observations of Emily's performance in school, so as to update her family on issues or progress that is observed. Furthermore, the occupational therapist may recommend calming techniques, such as pressing down on Emily's shoulder, or having her do heavy lifting to help calm her after recess, as well as

at home when Emily has an emotional outburst. Emily's parents should be encouraged to use deep tactile calming techniques, such as frequent bear hugs, or wrapping her tightly in a heavy blanket.

### **Justification of Interventions**

In determining what interventions will be advantageous for Emily's particular needs, research on the effectiveness of strategies must be considered. Of particular importance to Emily's family is that her emotional regulation issues be addressed. The school-based occupational therapist understands that some of Emily's emotional outbursts are rooted in sensory avoidance. However, in a school-setting, the occupational therapist may choose to center certain intervention activities on Emily's ability to engage in social participation rather than directing therapy toward sensory integration. In school, Emily is constantly introduced to new activities, most of which involve social interaction with her classmates. Greene (2004) found that children with autism spectrum disorders may benefit from programs that promote turn-taking, eye contact, as well as verbal and nonverbal communication. Therapeutic activities, such as Connect Four, will promote Emily's social participation by means of turn taking and use of polite language.

Banda, Grimmer, and Hart (2009) found that the use of daily picture schedules has helped students transition better between activities, and demonstrate overall better behavior. This strategy is considered evidence-based for teachers, and has benefited children with autism spectrum disorder. Without daily picture schedules, the child will experience difficulty completing activities independently, and will not be able to anticipate what they need to do next.

Handwriting Without Tears, a handwriting program for students from pre-K to 5<sup>th</sup> grade, helps with grouping letters and letter formation. It has been demonstrated that children can improve letter legibility, including ability to write their first name. Handwriting Without Tears is

easily incorporated into the class curriculum, as it low cost and time efficient, especially with children diagnosed with autism (Cosby, McLaughlin & Derby, 2009).

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