18q Deletion Syndrome: A Case Report

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**Occupational Performance**

**Activities of Daily Living**

Madison is a 13 and a half year old female who has been diagnosed with 18q deletion syndrome. Due to Madison’s condition, most of the eight areas of occupation have been negatively impacted. In regards to activities of daily living, areas including eating, feeding, dressing, functional mobility, personal hygiene, grooming, and toilet hygiene have been affected. Madison is able to doff her shoes, socks, and shirt successfully; however, she is unable to don her clothing or manage her clothing during toileting. She is dependent with toileting; therefore, she involves the use of a diaper. Madison needs a gastrostomy tube for feeding because she is unable to eat whole foods. Madison exhibits hypotonia throughout her body and suffers from joint laxity mainly in her upper extremities. She also has small hands with underdeveloped thumbs which makes activities, such as personal hygiene, difficult to complete.Due to her low tone, functional mobility has been negatively impacted since the age of four; therefore, she involves the use of ankle-foot orthotics (AFO’s) and a forward walker to ambulate independently.

 **Instrumental Activities of Daily Living**

Madison’s performance of instrumental activities of daily living has been impacted in areas such as communication, community mobility, care of others, and health management. Madison suffers from apraxic speech and must learn to incorporate technology in order to communicate effectively. She currently is able to communicate mostly by speech, but it is difficult for others to understand her. Her low tone and lack of finger strength makes it difficult to use technology in order to communicate successfully. Given Madison’s age and diagnosis, she is dependent on parents or other caregivers for community mobility. Madison has two younger brothers yet does not assume a typical older sister role. She has an established health management routine as she demonstrates aversion when given new activities in addition to her expected normal routine.

 **Education**

Madison attends a public school that is a multi-categorical or mixed level classroom (MCS) that she attends five days a week. Madison is not expected to complete schoolwork at the same level of comprehension as other typically developing children due to her diagnosis. Madison’s writing abilities are developmentally delayed; although she is able to manipulate writing utensils, a fisted grasp is utilized. This immature prehension grasp will be addressed within the occupational therapy intervention.

**Work**

Although Madison is 13 years old, volunteering could be a possible future occupation. She could join a volunteer organization that helps other children diagnosed with 18q deletion syndrome.

**Play and Leisure**

Madison enjoys playing with her two younger brothers, dolls, Elmo, and Muppets. She loves animals visits the zoo frequently to observe. She also likes playing any type of zoo games with her two younger brothers. Although leisure activities are not highlighted in this case study, Madison has difficulty with areas of play due to difficulty with transitions between activities.

**Social participation**

Madison has limited social interaction outside of playing with her two younger brothers. Her lack of toilet training and transitional difficulties may create a barrier to forming new friendships. She is also not interested in participating in age-appropriate activities which affects her peer relationships.

**Movement, Postural Reactions, and Reflexes**

Madison experienced early delays as she was unable to crawl or creep at the same age as a typically developing child. She began to ambulate with the assistance of a walker at the age of four which illustrated atypical completion of developmental milestones. She is currently wearing bilateral AFOs to control positioning and motion of her ankles and uses a forward walker to compensate for weakness and stability. Madison demonstrates poor static and dynamic standing balance which contributes to difficulties with lower extremity dressing.

The extremely low muscle tone displayed throughout her body, joint laxity, and small hands with underdeveloped thumbs impact Madison’s ability to manipulate small objects. However, Madison is able to manipulate writing utensils using a fisted grasp and prefers to use her right hand for writing or coloring activities. She is able to copy basic pre-writing strokes and is able to trace within ¾ inch of the letters of her name with 50% accuracy. She prefers to use a cylindrical grasp or a lateral pinch during fine motor activities. Lack of finger strength, hypotonia, and joint laxity impact her ability to isolate her index finger for use of technology.

**Sensory Integration and Self-Regulation**

 The ability to self-regulate is an essential part of emotional development; this includes demonstration of a child’s ability to gain control of bodily functions, manage emotions, and maintain focus and attention. Madison demonstrates difficulty transitioning between activities and demonstrates aversion to the addition of activities to her expected routine. Aversion is revealed through screaming and crying uncontrollably. Madison experiences the most difficulty with emotional regulation in the afternoon. Activities challenging her vestibular system will also denote inability to self-regulate emotions as she experiences gravitational insecurity and aversive behaviors. Madison is not toileting independently and requires assistance for this activity.

Sensory integration focuses on enhancing the child's ability to participate in daily occupations. This may be achieved through accommodation and adaptation to fulfill the individual’s needs. Madison is currently working on using technology to communicate. Her apraxic speech indicates the difficulty of her ability to translate conscious speech plans into motor plans.

**PEOP Model**

The PEOP model represents a top down approach where the client’s view of the problem is of primary concern (Brown, C. E., 2009). This model emphasizes occupations which consist of valued roles, tasks, and activities (O’Brien, 2012). Roles that are significant to Madison are daughter, sister, student, classmate, and being a teenager. Her current tasks include doffing her shoes, socks and shirt, ambulation with a forward walker, and writing and coloring. Activities she participates in are attending public school five days a week, watching television, playing “zoo” with her younger brothers, and using a technological device to communicate. Other activities concerning her health may include feeding with the g-tube, assisted lower and upper body dressing, assisted toileting, physical therapy, and speech therapy. From a PEOP perspective, the environment interferes with her mobility in the community. She has to rely on others for transportation and accessibility to ramps for her forward walker. PEOP intervention approach is appropriate for Madison because she could benefit to changes in her environment and adaptations to promote accessibility and more involvement in occupations.

**Theories and Practice Models**

 A frame of reference, or practice model, is the practical expression of theory and provides the therapist with specific methods and guidelines for occupational therapy (OT) intervention. Madison’s occupations are severely inhibited by her performance factors or actions of occupations. These include ambulating with her forward walker and bilateral AFOs, under development of her hands particularly her thumbs, limited grip, and digital strength. Modifications or adaptations to the environment or task would allow Madison to be more successful when performing activities resulting in greater inclination to participate in meaningful occupations. Therefore, the compensatory practice model would be applicable to Madison.

Psychological personal factors for this client include difficulties with emotional regulation, aversion to vestibular stimulation, and frustrations related to her inability to communicate effectively. The cognitive or neurobehavioral factors specific to Madison are her diagnosed moderate to severe intellectual impairment and her apraxic speech. The cognitive practice model is a problem-based approach or a CO-OP approach. This practice model allows the therapist to set a goal, plan in collaboration with the child the cognitive strategies to do that goal, do the activity, and then evaluate how the plan or practice worked. Involving Madison in the therapeutic process would be intrinsically motivating and provide her with therapeutic opportunities to discover strategies.

The applied behavior analysis (ABA) practice model uses resources in the environment for reinforcement of wanted positive behavior. Token economy reward systems would be extrinsically motivating for Madison and encourage her positive behavior. ABA would be a proficient method to address Madison’s emotional regulation, difficulty transitioning between activities, aversion to the addition of activities to her expected routine, and will encourage communication with her new technology device. Shaping behavior can be arduous, but the ABA practice model would provide guidance to intervention for Madison’s therapist.

 The developmental practice model would be the least relevant to Madison’s intervention. Her diagnosis of 18q deletion syndrome has greatly affected the acquisition of the majority of developmental milestones such as absent creep and crawl, and delayed ambulation until four years of age. She is also identified as having a moderate to severe intellectual impairment. This can be seen through her occupational decisions which closely relate to those of a toddler. Madison will continue to develop at a different pace than a typically functioning, age equivalent individual. Therefore, the developmental approach would be a poor choice for this client.

**Assessments**

Madison attends a MCS classroom in the public school system; therefore in elementary school she was assessed with the School Function Assessment (SFA). The SFA measures a child’s functional performance with social and academic activities in a school setting. It was used in conjunction with other educational professionals in the school to develop a comprehensive Individualized Education Plan (IEP). This plan continues to address Madison’s need for special education services.

The Pediatric Evaluation of Disability Inventory (PEDI) is an appropriate assessment for measuring function in children with physical or combined physical and cognitive disabilities. It is primarily used for young children, but older children can be evaluated if their functional capabilities fall below expectations of a 7.5 year old child with no disabilities (Haley, Coster, Kao et. al, 2010). Madison’s congenital disorder results in functional problems in areas of self-care, mobility, and social function. The PEDI identifies children who are not keeping up with developmental expectations of functional skill development and provides a measure of the degree of delay (Haley, Coster, Kao et. al, 2010). Madison is not a typically developing child and would benefit from the PEDI because it focuses on specific daily occupations whereas other assessments focus on developmental milestones that are not considered daily activities. The PEDI can also be used as a criterion referenced assessment for children older than 7.5 years of age.

The Child Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities of Children (PAC) are an age-appropriate assessment duo that could be employed. This assessment duo would be employed to monitor Madison’s participation over time in order to examine the effectiveness of her intervention program. The CAPE is a tool that measures participation in the formal and informal everyday activities of childhood in all types of non-school environments (King et al., 2004). One clinical advantage the PAC provides is that activity items reflect broader types of activities; test administrators can explore the client’s preference in substituting one activity for another similar activity. Both the CAPE and PAC could be self-administered by Madison with assistance by her parents or be interviewee-administered, having her respond to each item using activity cards and visual response pages that are provided in the supplemental tools for the assessment (King et al., 2004). However, the CAPE and PAC are not appropriate for children who are unable to comprehend the task of recognizing and sorting activities or responding to questions about the activities in the assessment. Therefore, more specific information about Madison’s intellectual deficits would be beneficial before implementing the CAPE and PAC.

**Functional Problem Statements**

1. Madison is unable to participate in lower body dressing independently due to poor static and dynamic standing balance.

2. Madison is unable to participate in age appropriate activities that require the vestibular system due to gravitational insecurity and aversive behaviors.

3. Madison is unable to transition between activities due to an inability to regulate her

emotions.

4. Madison is unable to participate independently in object manipulation due to her under

developed thumbs, low tone, and small hands.

5. Madison is unable to use her communication technology device independently due to lack of finger strength, hypotonia, and joint laxity.

**Family Goals**

1. Madison will dress and undress herself independently for ADL’s by donning her

pants and doffing her shirt, shoes, and socks with minimal verbal cues.

2. Madison will independently manipulate her paper and pencil to trace her name.

3. Madison will successfully interact and function in a play setting challenging her vestibular system.

4. Madison will participate independently in the use of communication technology.

5. Madison will demonstrate smooth transitions from one activity to the next by controlling her emotions.

**COAST Goals**

1. Madison will improve fine motor control to utilize her electronic

communication device independently within three months of OT service.

2. Madison will demonstrate appropriate behavior during activity transitions three out of four

times throughout OT session within three months.

3. Madison will don and doff her pants to and from knee level independently 50% of the time

within 3 months of OT service.

 **Occupational Therapy Goals/Objectives/Activities**

 Three OT goals were created for Madison by the therapy team in conjunction with the family. Two objectives were established for each goal and will be measured at six weeks; two client-centered activities per objective have been designed to help Madison achieve. These goals and objectives correlate with the family’s greatest concerns and will address critical aspects of fine motor control, emotional regulation during transitions, and lower body dressing. All three goals are designated for completion within three months of occupational therapy service.

**Goal One:** *Madison will improve fine motor control to independently utilize her electronic communication device within three months of OT service.*

**Objective One:** *Madison will improve digital strength by 25% based on digital pincer dynamometer measurements within six weeks.*

**Activities 1 & 2:** *Placing loose change into a piggy bank and utilization of finger puppets*

Madison’s family expressed the desire for enhanced communication with their daughter. The family and therapy team have been working in collaboration toward attainment of an electronic communication device for Madison; this is essential to effective communication. Madison’s first OT goal indirectly reflects a prioritized goal of the family: improvement in fine motor control. This skill will allow further progression of the client toward the use of this device efficiently. Two objectives have been tailored for Madison that function as short-term goals to be reevaluated in six weeks. The first objective places concentration on digital strength. There are two activities that will directly address this objective. The first activity involves the use of a “piggy bank” to increase strength and accuracy. This requires shifting loose change and in-hand manipulation which will then be inserted into a character bank. She will improve her in-hand manipulation and prehension patterns secondary to the progression of strength and accuracy with locating the slot and skilled release of the coin into the bank. In an effort to grade the activity up, Madison will put nickels and pennies into a counting piggy bank; this requires a stronger shift during manipulation of the coin in order to pass through the money counter. If the coins prove to be too hard, the activity will be graded down by using a piggy bank with a larger slot as well as offering larger coins such as quarters or gold dollars.

 The second activity to address the objective of digital strength is the use of finger puppets. This would increase the activation of muscles associated with digital flexion, extension, adduction, and abduction: all critical movements toward utilization of the electronic communication device. Grading up could involve using more than one finger puppet at a time. This activity could be graded down by having Madison simply grasp each finger puppet in play; this would allow incremental progression toward finger strength necessary to participate fully in finger puppet play. These finger puppets could also be used to mimic different situations from social stories which will be utilized for other objectives.

**Objective Two:** *Madison will improve her digital accuracy by independently placing her finger within one inch of a target within six weeks.*

**Activities 3 & 4:** *Finger painting and feeding treats to a therapy dog*

Accuracy is another component of fine motor movement which constructs the second objective underlying the ultimate goal of improved fine motor control. Accuracy will be regularly applied during many daily tasks; however, emphasis will be placed on location and activation of specific buttons on the communication device. This digital accuracy can be improved through the craft of finger painting which requires purposeful movements to paint unique pictures. This, in turn, will aid Madison in development of increased precision with hand and digital placement. In order to grade this activity up, Madison will trace pictures in her coloring book with the finger paints. To grade the activity down, a larger piece of paper, such as poster paper, will be used to add ease to the skill.

The second activity would require Madison to feed variably sized treats and food to a therapy dog. This would highlight different prehension patterns as well as purposeful and controlled release. Alteration of dog positions would require Madison to display postural stability as well as greater praxis. This activity could be graded up through the utilization of chopsticks or tweezers to feed the therapy dog. It could also be graded down by having Madison place a larger sized treat in front of the dog. The use of a therapy dog would increase both intrinsic and extrinsic motivation and progression toward goals; moreover illustrating the creativity of the therapist (Strzelecki, 2007). Each activity with pertinence to improved fine motor control has the ability to be graded up or down to provide the just-right challenge crucial to motivation maintenance.

**Goal Two:** *Madison will demonstrate appropriate behavior during activity transitions three out of four times throughout OT session within three months.*

**Objective One:** *Madison will demonstrate appropriate behavior during activity transitions two out of five times throughout OT session within six weeks.*

**Activities 5 & 6:** *Token economy and timer utilization*

Madison’s second occupational therapy goal addresses both the first and second concerns of the family. Transitions and emotional regulation prove to be problematic for the client; therefore the second OT goal requires Madison to display emotional control and self-regulation during activity transition three out of four times in OT sessions within three months. She often demonstrates aversion to transitions through uncontrollable emotional meltdowns which consist of crying and screaming. It is this particular behavior that puts strain on the family and limits their ability to introduce their daughter to new activities. The objective of emotional regulation will be addressed through the utilization of two activities. A token economy will be essential to increase desired behaviors through operant conditioning and positive reinforcement (Carr, Frazier, & Roland, 2005). As aforementioned, Madison has a deep interest in Sesame Street which will provide motivation for this activity. Each time Madison does not cry or scream in a difficult situation, she will be rewarded immediately with her token: a Cookie Monster sticker on a sticker chart. The gross of three stickers will allow her to watch one episode of Sesame Street. The therapist will closely monitor this activity to ensure compliance of the multidisciplinary team as well as the family. Consistent knowledge of results will provide a solid foundation for Madison to master. The activity can be modified over time allowing Madison to save tokens to spend them on higher preference reinforcements (Carr, Frazier, & Roland, 2005). The activity can be graded down by decreasing the number of tokens she needs to earn to get her reinforcing reward.

The second activity to help Madison demonstrate appropriate behaviors during transitions is through the utilization of a timing device. This timer would create awareness about the end of the activity, therefore signaling the client that it is time to transition. It would provide both visual and auditory cues about the time frame until transition. This tool is generalizable to many different settings and can be used with ease by each member of the multidisciplinary team and family. This activity could be graded down by allowing an increased amount of time for each transition. In contrast, it can be graded up by allowing less time to increase greater efficiency between transitions. Regardless of the activity, it is essential for the therapist or caregiver to clarify instructions to guide a smooth transition for Madison.

**Objective Two:** *Madison will participate actively throughout preferred and non-preferred activity shifts with minimal verbal cueing within six weeks.*

**Activities 7 & 8:** *Providing choices and social stories*

The second objective to improve emotional regulation during transition is Madison’s active participation throughout the preferred and non-preferred activity shifts with minimal verbal cueing within six weeks. Participation in decision making is the first activity that will bolster success with this objective. This involves providing Madison with a choice or preference. This method has limitless transferability and can be used consistently in a wide variety of settings. It is suggested that children are more engaged and participate more actively when asked for their preference (Dunlap & Liso, 2004). This method proves effective both during and between activities (Dunlap & Liso, 2004). Providing choices will help ease the unexpected shift in activity that creates stress and trepidation for the client. The PAC assessment will be used to determine Madison’s preferences in play activities to further client motivation and track progress. The therapy team will be utilizing a choice board with Madison to indirectly address fine motor skills as well.

The second activity to support Madison in learning to participate actively during transition is through simple social stories. These stories can be situational or skill dependent which provide the client with a distributed source of practice. Stories are composed of four parts: the social cue, associated reactions and events the individual may see, the response and action that is expected of the individual, and the reason (Lockwood, 2008). The demonstration and modeling provided by simple social stories will provide Madison with a greater understanding of societal and familial expectations. Stories will provide Madison with a functionally-equivalent option to replace inappropriate reactions (Lockwood, 2008). The specific social story in this instance will provide Madison with an alternative behavior to deal with the stress of transition. The activity can be graded up by acting out various scenes to promote variable practice for increased preparation. These scenes could be recorded for multiple views. To grade the activity down, the social stories will involve fewer steps with more simple instructions in order to complete an activity.

**Goal Three:**  *Madison will independently don and doff her pants to and from knee level 50% of the time within 3 months of OT service.*

**Objective One:** *Madison will demonstrate static and dynamic balance independently with the use of her walker for dressing within six weeks of OT services.*

**Activities 9 & 10:** *Standing puzzle and popping bubbles*

The final occupational therapy goal is based off the family’s first concern of assistance with clothing management with emphasis on the restroom setting. The first objective addresses this goal through intervention tailored to support Madison’s ability to demonstrate both static and dynamic balance necessary for dressing within six weeks of OT. The two activities will be used concurrently to address balance as a whole while Madison uses her walker for stability. The first activity will highlight static balance. Madison will put a small puzzle with large pieces together while she stands. This activity can be graded up by increasing the number of pieces of the puzzle as her standing balance and endurance progress. Grading down will involve the therapist incorporating a puzzle with fewer pieces which will decrease the amount of balance and endurance necessary for the activity. The occupational therapist will continue to time Madison during this static balance activity to ensure improvement before the six-week reevaluation. The second activity will address dynamic balance skills. The therapist will blow bubbles in the air while Madison reaches to pop them with her hands. The therapist can blow the bubbles in different angles and directions to provide distributed practice while initiating standing weight shift. The activities of the balance objective can be graded up and down with altering assistance levels and duration.

**Objective Two:** *Madison will independently don and doff her pants to knee level within six weeks of OT.*

**Activities 11 & 12:** *Donning “fun” pants and un-stuffing pants*

The second objective is for Madison to independently don and doff pants to knee level within six weeks of OT. This will allow Madison to participate actively in clothing management during toileting: an aspect of a rudimentary ADL. The first activity to address this objective is a blocked and part practice method using different types of pants. Madison will practice dressing herself in alternating pants styles with fun designs, different sizes, and costume appearances. This will create a more client-centered practice through providing fun outfits that appeal to the client. This specific activity was created to assist Madison in development of anticipatory body setting. Knowledge of practice and verbal cueing will be utilized heavily within the first two weeks then slowly retracted after successful demonstration. The activity can be graded up by involving pants with buttons and/or zippers; to grade the activity down, the therapist will provide low resistance Thera-band as preparatory activity in an effort to reach the just-right challenge.

The second activity will entail filling a large pair of pants with novel items. Madison will put on the large pair of stretch pants and reach and grasp to pull out items inside. The reach will not only increase stretch and strengthening necessary for her goal, but also address the dynamic balance component of the first objective. This activity will provide variable practice which will keep Madison both motivated and interested through the element of surprise. This activity can be graded up or down by increasing or decreasing the number of items Madison has to pull out of the pants to finish the activity.

**Treatment Plan**

**Environmental Setting**

Madison will attend OT services at an outpatient pediatric clinic. This clinic will have handwriting workshops, orthotics clinic, sensory integration gym, aquatic therapy, pet therapy, and a social skills group. Assessments and treatments for developmental impairments in fine motor skills, activities of daily living, sensory processing, and feeding disorders will be done in an effort to enhance the client’s independence in her daily activities. The clinic will integrate occupation-based treatment allowing the child to participate in an environment generalizable to the natural home and/or school environment.

**Soap Note**

Occupational Therapy Report

Name: Madison Age: 13 yrs 6 mo 1°Dx: 18q Deletion Syndrome (Proximal)

Date: 02/01/14 Time: 4:00 PM

**S:** *Client was irritable and frustrated throughout therapy session, but emotional stability improved with engagement. Client maintained good eye contact, and was able to begin and complete tasks with verbal and physical cueing.*

**O:** *Client participated in a 60 minute OT session in outpatient clinic. Focus was placed on improving fine motor control for increased engagement in electronic communication device operation, LE dressing, and compliance with activity transitions. Client showed frustration and difficulty regulating emotions during iPad communication activities and was constantly babbling or trying to communicate verbally. Client demonstrated improved attention and desire to participate in assisting with LE dressing.*

* **Fine Motor Skills***: Client displays fisted grip to manipulate writing utensils, and has right hand dominance. Client is able to copy basic pre-writing strokes and is able to trace within ¾” of the letters of her name with 50% accuracy. Client prefers cylindrical grasp or a lateral pinch during fine motor activities. Lack of finger strength, underdeveloped thumbs, hypotonia, and joint laxity impact her ability to isolate her index finger for use of communication technology. Client displays difficulties with simple rotation such as manipulating scissors.*
* **Cognitive Skills***: Client suffers from apraxic speech but still attempts to speak verbally although speech is often unintelligible. Client demonstrates difficulty transitioning between activities and displays aversion to the addition of activities to her expected routine. She demonstrates this aversion through screaming and crying uncontrollably. She is emotionally labile and has the most difficulty regulating later in the afternoon, which was experienced in today’s session. However, engagement and focus improved with repetitive visual, verbal, and physical prompting.*
* ***Strength & Stability****: Client demonstrates gravitational insecurity and aversive behaviors when placed in any situation that challenges her vestibular system. Client has poor static and dynamic standing balance which affects her ability to independently complete LE dressing.*

**A:** *Client’s poor fine motor control and frustration limits ability to engage in appropriate communication with caregiver activities and self-help skills. Low tone, underdeveloped thumbs, and impaired functional hand use interfere with manipulation of small objects. Despite emotional regulation problems, client demonstrates progress in engagement of tasks with repetitive visual, verbal, and physical cueing. Potential to improve areas of concern is demonstrated by client’s increased engagement and progress in self-help skill and communication during treatment session. Client will benefit from continued skilled OT intervention to increase emotional regulation, fine motor strength, and functional hand use needed to improve occupational performance and successful engagement in electronic communication.*

**P:** *Madison will continue to receive skilled OT services 2-3x/week for the duration of 6 months to improve fine motor skills, encourage LE dressing, and decrease emotional outbursts with activity transitions. It is also recommended that Madison continue PT and SLP treatment.*

**Discharge Environment**

Madison attends therapy services at an outpatient clinic and a post-discharge plan will not be necessary. She will continue to receive services at the outpatient clinic and during school until goals and objectives are accomplished. Continuous maintenance on her daily routines will not only optimize her lifestyle, but will increase her level of functioning as well.

**Recommendations**

The following statements are recommendations for family, caregivers, and significant others to comply with to continue intervention at home:

* We recommend that the family read social stories with Madison prior to interaction and social participation with peers.
* We recommend that the family continue the use of a token economy board to encourage appropriate behaviors during transitions.
* We recommend familial advocacy for Madison to receive the resources needed for success.
* We recommend continually incorporating motivational activities which include her current interests into her daily routines
* We recommend that the family incorporates personal photos into social stories and communication device to enhance meaningful simulation.

**Evidence Justification**

Madison displays emotional aversion in that she throws tantrums by displaying uncontrollable screaming and crying when transitioning activities. She also has a hard time with emotional regulation when placed in a situation challenging her vestibular system. “The primary goal of the token economy is to increase and maintain appropriate behavior although a response-cost procedure is sometimes added to reduce problem behavior” (Carr, Frazier & Roland, 2005). Token economy is used amongst a wide range of populations and behaviors across a variety of settings. The token economy is implemented effectively amongst children with disabilities. Despite such widespread applicability, there are several learner characteristics that may inhibit the effectiveness of this type of reinforcement. This will need to be taken into consideration when determining if this will be an appropriate intervention activity for the client. The results of subsequent studies have shown that, with advanced planning, maintenance strategies can significantly improve the durability of a token economy’s treatment gains (Carr, Frazier & Roland, 2005). If the system is well designed and skillfully implemented, the token economy should prove to be an effective behavior-change strategy for Madison.

 In addition to the token economy, using social stories can help improve Madison’s outbursts when transitioning between activities. “A social story is a short story that is written in a child-specific format describing a social situation, person, skill, event, or concept in terms of relevant cues and appropriate social responses. Each social story teaches children how to manage their own behavior during a given social situation by describing where the activity will take place, when it will occur, what will happen, who is participating, and why the child should behave in a given manner” (Scattone, Wilcyznski, Edwards, & Rabian 2002). A study was done to test the effectiveness of social stories on children with autism. This study was a multiple baseline design used to evaluate the effectiveness of social stories on reducing disruptive behavior. Three participants ranging from 7-15 years of age participated in this study. The results of the study indicated that the overall disruptive behaviors of the participants decreased (Scattone, Wilcyznski, Edwards, & Rabian 2002). Social stories are an effective way to decrease her emotional outbursts. Social stories are also convenient and client-centered.

 Madison is a prime candidate for animal-assisted therapy due to her small hands and thumbs, low tone, lack of fine motor strength, and her interest in animals. Animal assisted therapy is an evidence based intervention that suggests many benefits to areas such as mental health, gross motor skills, and an overall increase in motivation. Animal-assisted therapy has also been suggested to be a useful adjunct to language education and development. The presence of a dog in therapy indicates improvement of task completion in children. Evidence suggests the dog may serve as a motivator either by enhancing a child’s mood state or by increasing their drive to perform a task.

One study entitled “The Role of Therapy Dogs in Speed and Accuracy to Complete Motor Skills Tasks for Preschool Children” examined a variety of tasks in which the mere presence of a dog provided benefits in the areas of locomotion, stability, and manipulation. Locomotion skills consisted of leaping, hopping, and crawling; stability entailed walking on a balance beam, and rolling over; the area of manipulation skills were analyzed while performing skills such as throwing a bean bag. The time necessary to complete each task and ratings of task performance were recorded comparatively for each child in the presence and absence of a therapy dog. The study indicated the presence of a dog benefitted not only the overall speed of completion, but also the level of extrinsic motivation. This, in turn, aided in the execution of gross motor skills. Although speed significantly improved, results in terms of accuracy did not show significant improvement. Madison would reap great benefits from this mode of intervention due to her interest in animals and diagnostic eligibility. The use of an animal may help Madison improve deficits that are negatively impacting her completion of activities of daily living. Animal-assisted therapy is a meaningful and client-centered approach that will induce greater neuroplasticity; consequently resulting in increased demonstration of intervention goals (Gee, N. R., Harris, S. L., & Johnson, K. L. 2007).

**Conclusion**

The lack of available resources contributing to Madison’s performance of occupations has greatly hindered her quality of life. The therapy team tailored an intervention plan based on Madison’s current abilities and family goals to ensure ongoing success for the client. These goals will be addressed through the utilization of specific activities customized to provide both motivation and a just-right challenge to initiate progression toward goal attainment. The team has also provided simple methods of at-home intervention to increase involvement of the family and caregivers in Madison’s advancement. It is the diligence of family, caregivers, and therapists that will ultimately set the foundation for Madison’s continuing efficacious outcomes.

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