REFLEX INTEGRATION PROGRAM IS SUCCESSFUL AT SCHOOL

Case History by Kim Willkom, Occupational Therapist
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1. Background Information

The reflex integration program was successful during 2012/2013 assignment at an elementary school for this occupational therapist. The current number of students receiving occupational therapy services at this school included 16 (10 boys and 6 girls). The students’ ages were 5 years old to 10 years old with grade levels from Kindergarten to Grade 5. The diagnoses of students ranged from Developmental Delays, Autism, Asperger’s, ADD/ADHD, Asthma, Allergy to soy/corn/peanuts, Lactose Intolerance, Bipolar Disorder, Mood Disorder, Anxiety, OCD, and Tourette's Syndrome.

2. Description of the Presenting Problem

The 16 students previously received occupational therapy with a single point Lycra Swing, which was often used for students daily by staff at the elementary school.

Currently with the change of occupational therapy staff at the elementary school for the 2012/2013 school year, the school psychologist recommended that each student be assessed and supplied with the appropriate sensory program based upon their individual needs for the Individual Education Plan (IEP) and staff be trained in those programs. As the occupational therapist assigned to this elementary school, students were assessed and provided the most beneficial sensory program. A one day in-service at the elementary school allowed staff to learn and participate in the program. The reflex integration program was new to many staff members.

If the single point Lycra Swing was taken away from students receiving occupational therapy, oftentimes negative behaviors increased to an unsafe level.

The Occupational Therapy staff noticed that many students “craved” the vestibular stimulation provided by the Lycra Single Point Swing. The students showed indifference and absence of focus following those times on the swing.

However, after using the Single Point Lycra Swing, the students observed by occupational therapy staff appeared to lack a sense of “Presence” in their ‘body-mind’ system. These students demonstrated a heightened state of activity, with more active patterns of movements that were unsafe, such as climbing on equipment, tipping over mats, running hyperactive, jumping crazy, and unable to respond to verbal or visual directions from therapists. The students demonstrated lack of control and behaviors became impulsive which activated reflexes, the sensory-motor patterns used in stress or survival.
3. Reflex Diagnosis

A reflex response, an automatic genetic response to stimuli, must be matured and integrated to the end of infant stage of child development, which allows a child to move to the next stage of learning—conscious abilities and skills.

The following reflex patterns were evaluated: Head Righting Reflex, Tonic Labyrinthine Reflex (TLR), Asymmetrical Tonic Neck Reflex (ATNR), Symmetrical Tonic Neck Reflex (STNR), Vestibulo-Ocular, and Optokinetic which are all essential for support of neurophysiology of learning in children. The 16 students were seen by occupational therapy for reflex assessments of these reflex patterns. The main goal was to find the level of development of these reflex patterns, and possible challenges with physiological and cognitive functioning of the children.

The following is a definition of each reflex and protective and developmental task.

Head Righting Reflex: The Head Righting posture is a reaction of head movement triggered by whole body movement and change in body posture and appears at 2-3 months of life. When we bend to the side, the head automatically goes to the other side, trying to keep stability. The Ocular and Labyrinthine Head Righting reflexes are two types of this reflex. The Ocular Head Righting reflex works when the eyes are open. The Labyrinthine Head Righting reflex works when the eyes are closed and depends on vestibular information. If the Head Righting posture is undeveloped, there will be challenges in vision, auditory, balance and equilibrium, and learning.

Tonic Labyrinthine Reflex (TLR): The TLR emerges 10th to 11th weeks in utero. TLR Flexion integrates 3-4th months and TLR Extension 2-4th months of life. The TLR is activated by the infant’s head position in space. This reflex allows for reaction to changes in gravity, and for stability, equilibrium, muscle tone, proprioception, and balancing. If there are challenges with TLR, the child may lack movement coordination, time and space perception, and limited cause and effect skills.

Asymmetrical Tonic Neck Reflex (ATNR): The ATNR serves as a neuro-structural basis for development of the auditory perception and processing, particularly of the monaural and later binaural hearing. The ATNR is a tonic and vestibular one, so improper activation of it can lead to wrong compensation by the Abdominal Sleep Posture response (ASPR). The conflict between ATNR and ASPR causes ignoring the auditory stimulus and pushes on the vestibular system even more – makes it more hypersensitive and immature. ATNR when it deals with auditory information it affects decoding and coding of the auditory information and speech. So in this condition of reflexes development the child finds themselves in viscous circuit – ATNR and vestibular reflexes confront with each other, brain-body system tries to create compensation which is ASPR – leading to ignoring the auditory stimulus and causing impulsive behavior and routine actions (S. Masgutova, 2010).
Symmetrical Tonic Neck Reflex (STNR): STNR emerges the 13th week in utero and integrates the 10th month of life. The STNR develops bilateral patterns of body movement and information processing for the left and right hemispheres. The STNR plays an important part in seeing and hearing, along with space and time orientation. If challenges then the child may lack coordination of neck, arms, hands, and upper body muscles.

Vestibulo-Ocular Reflex: The Vestibulo-Ocular Reflex is required for clear vision. The head moves and the eyes look at a stationary object, moving from binocular to monocular vision. The VOR is a reflex eye movement that stabilizes images on the retina during head movements either horizontal or vertical. If the VOR is impaired, it is difficult to read or learn.

Optokinetic Reflex: The head is stationary and the object moves, and eyes moving from monocular to binocular vision and vice versa. The Optokinetic Reflex activates midline for board to paper transfer becomes less stressful, so the student can take notes off the board in class. Optokinetic reflexes adjust eye position during slow head movements. Optokinetic reflex allows the person who is walking to focus their eyes on large objects in the visual field. Like a driver stopped at a stop light may misinterpret the sudden movement of the bus in an adjacent lane as their own car rolling backward. The driver hits the breaks only to realize the car was not moving.

All the students assessed by occupational therapy demonstrated significant hyperactive reaction for stimulation for each of these reflexes.

In particular, the assessment of reflexes showed that the response of students for specific stimuli was triggering hyperactive response in all 16 students in September 2012:
- Tonic Labyrinthine Reflex (TLR) – in 94% of students. The average level of development of this reflex was significant for all 16 students. There were 8 students whose level of development reached 20%. One student reached 100% of reflex development for the TLR reflex.

- Asymmetrical Tonic Neck Reflex (ATNR) – in 94% of students. The average level of development of this reflex was significant for 2 students who reached 100% development for the ATNR reflex, and 4 students reached 50% development of the ATNR reflex. The fact that majority of the students in testing of ATNR have demonstrated wrong response – so called abdominal Sleep posture.
- Symmetrical Tonic Neck Reflex (STNR) – in 100% of students. The average level of development of this reflex was significant for 5 students reaching 30%, another 5 students reaching 20%, and 5 students reaching 50% to 80% of development of the STNR reflex at the end of the school year (June 2013).

![Level % of Development for STNR Reflex - 6/2013](image)

- Vestibulo-Ocular Reflex – in 94% of students. The average level of development of this reflex was significant for 7 of the 16 students who reached 20% level of development of the Vestibulo-Ocular Reflex. One student reached 100% development of this reflex, and 6 more students reached between 30% to 70% positive change for this reflex by June 2013.

![Level % of Development for Vestibulo-Ocular Reflex - 6/2013](image)
Optokinetic Reflex – in 94% of students. The average level of development of this reflex was positive for all 16 students who made between 10% to 100% level of development for the Optokinetic Reflex in June of 2013.

The hyperactive response in these reflexes in the age of the students (5 years to 10 years old) would mean the immaturity of their physiological circuits of reflexes showing an importance of proper work with these circuits, otherwise too much activation of acceleration mechanism by swinging motions increase stress hormones in their body (Masgutova, S., et al, 2014).

The importance of these reflex patterns becomes obvious from their basic task to support vestibular-ocular and head righting and postural control for maintaining the cognitive hands-on task. An example would be the visual work of reading which addresses our eyes and the STNR reflex. For listening and hearing we require certain head positioning to perceive the sound. The ATNR reflex works for active hearing and human speech recognition, and the TLR for relaxed hearing.

Based upon the reflex assessment of 16 students, I as the Occupational Therapist recommended No Swinging from a Single Point Swing at the Elementary School. This recommendation was made to all staff during the October 17, 2012 In-Service by Kim Willkom, Occupational Therapist and Michelle Miklesh, Certified Occupational Therapy Assistant. The reason for this decision was that these children demonstrated immature reflexes and the activation of the Swinging from a Single Point Swing was triggering the level of excitation in
these students improperly and their hyperactivity was increasing with this kind of stimulus inadequately, and affecting their focusing, school skills, and comprehension.

All students were recommended for training the above reflex patterns and also additional training of the Head Righting response.

II. Intervention

1. MNRI® Masgutova Method of Reflex Integration

The Masgutova Neurosensorimotor Reflex Integration program was used as it works with reflex development, integration of its sensory-motor components, and provides children and adults safe tools for the use of natural, genetic motor resources to facilitate successful neurosensorimotor development and joyful learning.

This program provides accurate information of reflex definition, possibilities to test a reflex, and to comprehend their role for entire neurodevelopment and learning mechanisms.

For example, the knowledge of the ocular and labyrinthine reflex is essential and school professionals still have lack of this knowledge. The Ocular and Labyrinthine Head Righting Reflexes appear at the age of 2-3 months. The infant reflexes such as Sucking, Babkin Palmomental, ATNR and STNR create the basis for formation of the Head Righting Reflex. These infant reflexes develop movements and the ability to keep the head in different positions for future perception of lines and perspectives and stabilize the posture and vision and activate the auditory system for school skills formation. Thus it is important to develop the foundational reflexes for motor development and sensory integration.

The school staff and professionals do not know that when the Ocular and Labyrinthine Head Righting Reflexes do not work together simultaneously, this will interfere with students balance, disturb control of eye movements, disturb visual perceptual skills, and development of the sight-hearing system. It is so important for trained professionals to understand the importance of reflex development so that key reflex techniques are implemented versus use of sensory equipment (Single Point Swing).

After the assessment our 16 students were then provided with an individualized sensory program to address the development of these six reflex patterns. The students were seen 20 to 60 minutes per week for occupational therapy.

The 16 students participated in correction procedure embracing exercises for Asymmetrical Tonic Neck Reflex (see the reason described above). The students were assessed initially in September 2012 and then again in June of 2013 (see chart below). The results of individual students on the ATNR presented below shows that 94% of them (15 individuals) were presenting a deprived ATNR. Also 63% of students (10 Individuals) were mixing the response of the ATNR with ASPR, and 31% (5 individuals) were showing negative compensation of the
ATNR by the ASPR. These results were meaning that the structural aspect of the auditory process would not be supporting the auditory decoding and coding.

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<th>ASYMMETRICAL TONIC NECK REFLEX</th>
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The correction work of the ATNR pattern, particularly demonstrates that the positive changes for 56% of students (9 individuals) has occurred for the students (Students 2, 4, 5, 7, 9, 11, 12, 13 and 16). The observation of the students by teachers and myself has shown that changes in ATNR moved the students to increase their ability to listen, to hear, and to comprehend the school material on a higher level.

The integrating exercises were also used for Head Righting reflex, and they included the use of the balance board with additional activities while using the balance board.

The students also demonstrated positive changes for Head Righting reflex, Tonic Labyrinthine Reflex, and Symmetrical Tonic Neck Reflex, which was proving the sufficiency of the work with reflex integration exercises.

The integrating exercises for Optokinetic and Ocular-Vestibular Reflexes included short 1-2 minutes activities with frequent rest breaks.

The results and procedure with integrating exercises were then demonstrated to school staff including their educational assistants, special education teachers, other special education
assistants, and parents/family for them to cooperate and support the educational process of children based on reflex integration.

Results:

1. Concept of reflex integration:
   The role of motor reflexes in the human development of the nervous system can be described as follows:
   1) Reflex integration supports growth to myelinate the nerve net system for brain maturation and future success in consciously developed motor and cognitive skills.
   2) The important task of the reflex is to ensure survival and protection so that a person feels safe and curious about life for positive development.
   3) The reflex integration process is an informational blueprint of neurodevelopment (i.e. ATNR reflex affects the development of mono- and binaural hearing and space orientation).
   4) Reflexes determine emotional responses and behaviors (i.e. tactile defensiveness may develop and integration of reflex patterns can provide feelings of safety and joy).
   5) Reflex integration indirectly influences future speech development including articulation and communication (i.e. Head Righting, Babkin, Eye Leveling, TMJ leveling reflexes effect oral motor coordination and articulation).

2. The MNRI® Assessment can recognize and explain/interpret physiological based learning challenges for children. This provides a beginning treatment plan for children who lack the level of development of specific reflexes.

3. As seen with the 16 students from the elementary school, all students demonstrated positive results in their development of the identified six reflexes. School staff and professionals made positive changes to support those students in the development of the reflexes. The students showed positive gains in learning, social skills, and enjoyment of life.

This program responds to the expectations of educators and parents. The parents, school staff, and educational assistants reported a significant improvement in student behavior, social skills and ability to communicate. The reflex integration program is allowing composing a model of the work with reflex patterns and school skills to reach the goal of optimizing the physiological mechanisms of the development and learning for students.

The topic of development of reflex integration finds its way in the educational system as a key to understanding children with special learning challenges. The many professionals in the education system are searching for answers to developmental challenges children face on a daily basis. Also parents and caregivers continue to search as well for explanations of behavioral, cognitive, social or other challenges for children. The reflex integration program successfully demonstrates positive changes for children at the elementary school age. The
reflex integration program is essential for the future educational system and opening new perspectives so that all can be successful and joyful learners.

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References:

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