Reflexes, Development, Hippotherapy & Home Programs

By Heidi Jo Sovacool, OTR
Objectives

- Participants will:
  1. Identify where reflexes originate
  2. Appreciate and understand the Vygotsky and Masgutova concept of how maturation of development is based on reflexes
  3. Understand that if an area has dysfunction it may be able to be pinpointed to an underlying reflex
  4. Apply the diversified application of reflex theory to hippotherapy practice.
  5. Articulate the benefits of home programming.
  6. Develop at least one home program.
Anatomy: The Brain

- Reflexively speaking, there are three general areas of the brain.
The High Brain

Contains:
Cerebrum, frontal lobe, temporal, parietal and occipital lobes. Greater hemispheres of the brain.

Purpose:
Learning & Development, Growth (information) and Development (information)
The Diencephalon

Contains:
Thalamus, Hypothalamus, Epithalamus, subthalamus and the Basal Ganglia.

Purpose:
Flight or Fight (automatic) Movement programming and control, Kinesthetic long term memory Joy, fun
The Brain Stem

Contains:
Medulla Spinalis, Medulla Oblongata, Pons, Mid Brain

Purpose:
Survival (fight or flight)
Protection (freezing)
Anatomy of the Spinal Cord

Review of reflex arc.

- **STEP 1:** Arrival of stimulus and activation of receptor
- **STEP 2:** Activation of a sensory neuron
- **STEP 3:** Information processing in CNS
- **STEP 4:** Activation of a motor neuron
- **STEP 5:** Response by effector

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Reflex Theory

“All acts of conscious and unconscious life are reflexes by their origin”

I.M. Setchenov (1995)
Russian Physiologist

“A reflex is a nervous system reaction caused by the stimulation of receptors of skin, tendons, muscles, mucous membranes and pupil receptors”

I.P. Pavlov (1927) and I.M. Setchenov (1947)
Reflex Theory

“The first infant movements do not disappear; they continue to work in unison with higher neural formations, entering into their structure as subordinate elements and transferring part of their functions to higher, “younger” and new centers”

L.S. Vygotsky, 1930
Russian Psychologist
Reflex Theory

“MNRI ® (Masgutova Neurosensorimotor Reflex Integration) introduces the concept of reflexes as not only protective responses to stress and danger, but also the neurophysiological foundation for higher level physical, emotional and cognitive development. This concept opens new directions for research and discovery about the relationship between primary motor development and physical, emotional and cognitive skills. The key element in MNRI ® is the understanding of a reflex as genetic motor code and unit for both primary and conscious motor system development.”

Svetlana Masgutova
Reflexes are Automatic and Connect to Development

Robinson Hand Grasp Reflex
Robinson Hand Grasp

How it works:

Stimulus point: “knuckle area” (Volar MCP area) on the palm side of the hand.
Result: Hand Grasp.

This reflex first appears during the 11th week in utero. The reflex is already seen in the first week after birth. It is active from birth through the 1st year of life. The reflex is integrated into manual skills and into the whole movement coordination system at the end of the 1st year of life.

Thus, stimulus produces action.
Can reflexes be utilized to spur rehabilitation and healing?

Yes.

“…[Reflex Integration] techniques are designed to restore neurosensorimotor development; to integrate primary movements, reflexes, coordination systems, and skills; and to enable optimal functioning, development, and learning. They activate innate reflex patterns; develop sensory-motor systems; improve sensory processing, movement skills and cognitive abilities; and promote emotional growth.” “…. [Reflex Integration] also enhances motor skills and cognitive abilities in highly functioning individuals. This approach promotes joyful learning in children and adults as they improve their neurosensorimotor skills.”

Svetlana Masgutova, 2012
Reflex Integration has been described as:

“Awakening the innate intelligence of nature within the body”

Pamela Curlee, 2013
In other words:

Reflex Integration techniques provide the stimulus and motions for our bodies to “reset” and “strengthen” our reflexes which can result in healing.
Reflexes and Hippotherapy
An illustrated example of the combined use of Reflex Integration with hippotherapy

Case Illustration:
Adam is a 7 year old child with Autism. The client is unable to sit or stand long enough to attend to his basic ADL’s. Client requires 1:1 max assistance for bathing, dressing, toileting and eating. Client enjoys running, hopping, jumping, leaping, rolling and anything with spinning toy wheels. However when asked to demonstrate a new motor skill, client lacks the ability to replicate it. Hand over hand assistance must take place for this new motor pattern to be demonstrated. The client lacks eye contact in social situations and can become combative with redirection. Client does not like tactile stimulation or even hand holding for safety.
Hippotherapy Session

OT Clinical Assessment: Client appears to have non-integration of the **Spinal Galant Reflex** due to: Poor gross motor programming and control, delay in developmental of cognitive processes (focusing, memorizing, thinking), fidgeting, tendency for ADD and ADHD-like behaviors, fatigue and low motivation for motor and cognitive activities, tactile sensitivity and defensiveness, and deficits in auditory processing.

Clinical Plan of Care: Initiation of the Spinal Gallant exercises on the mat table for 15 minutes prior to mounting the hippotherapy horse. This is to reinforce the pairing of the stimulus with the correct motor response.
Choosing the Hippotherapy Horse

In this situation the client would benefit from continued "side to side" (lateral) motion to further strengthen the Spinal Galant reflex integration process. The lateral spinal muscles are largely responsible for the reception of the stimulus and producing a reaction. Thus, a horse with a strong lateral movement is chosen.
Equipment

Safety Helmet

Two Handled Safety Belt

A thick wool pad with connecting leathers and attached safety irons (Peacock stirrups). It is held in place with a no-handled surcingle.
Human Resources

Horse leader

Bilateral side walkers

Client

Therapist
Method

Once the client is safely mounted, the horse is lead around the arena at a strong working walk, both directions for five minutes without stirrups, then five minutes with stirrups used. Horse halted.

Mounted ADL type activity initiated (brushing teeth).

Hippotherapy movement continued with tighter turns (such as serpentines to emphasize greater lateral movement) at both directions for a total of ten minutes. Horse halted.

Mounted ADL type activity conducted (sequencing of dressing and fastener use).

Hippotherapy movement continued with tighter, shorter serpentines.
Treatment continued alternating functional activities with hippotherapy strategies.

Each alternate (equine assisted) activity reinforces the enhancement of the natural reflex.
Results:

Improved both cognitive/attention and physical performance with less “wiggling”. Client was able to attend and focus in order to brush his teeth with less assistance and participate (willingly) with minimal assistance in other presented (ADL) tasks.
Plan

In order to facilitate continued benefits, the clients’ mother was educated in the home program for the Spinal Galant integration exercise. Home programming was established to track the home program usage, changes in his ADL performance as well as to monitor unfavorable behaviors.
Home Programs

Why?

Who benefits?
# Home Program Tracking Grid

Client name: ___________________________  Month /Year: ___________________________

Directions: Please complete 1 home program per day, 5/7 days a week. Please alternate home programs for variety. Please indicate which program was used in the appropriate box. This must be turned in to your therapist PRIOR to re-certification of therapy services. The therapist will use this data to support the construction of the re-certification document.

<table>
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<th>Sunday</th>
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Programs: (A) Robinson Hand Grasp 3x, (B) Tying shoes with two differently colored laces 3x, © Babkin Palmomenta 3x, (D) Pantomime hand gestures 10x.

Notes:

I, the client’s guardian/parent acknowledge that the above information is true.

Signature: ___________________________  Date: ___________________________
Behavior Tracking Grid

Client name: _______________________________  Month /Year: __________________

Directions: Please place a “tally” mark for every time the behavior has been identified. This must be turned in to your therapist PRIOR to re-certification of therapy services. The therapist will use this data to support the construction of the re-certification document.

<table>
<thead>
<tr>
<th>Behavior List</th>
<th>Not coming when name is called</th>
<th>Meltdown during ADL activity</th>
<th>Bolting from the vehicle</th>
<th>Mouthing or biting objects or people</th>
<th>Randomly taking clothes off</th>
<th>Hitting others</th>
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Monthly goal: Client will reduce weekly total of identified behaviors by 5 each week.

Notes:

I, the client’s guardian/parent acknowledge that the above information is true.

Signature: _______________________________  Date: __________________
Spinal Galant Reflex Integration

1. Sensory Activation-stroke down the back. Slowly run your fingers along the side of the person’s spine from neck to sacrum.

2. Press downward (toward the table/floor) on your partner’s shoulder and hip, and ask them to resist slightly into your hands.

3. Lateral flexion of one side of the body. [Crossing arms]Stretch the side of the body by pushing the shoulder and hip away from each other. Next, ask them to resist against your hands bringing their hip and shoulder together.

4. Lateral flexion-extension of the side of the body. Flex the side of the body by pushing the hip and shoulder together. Next stretch them apart as above.

5. Repeat these exercises in the same manner on the other side. This exercise can be done with immobile persons even when they cannot comprehend the instructions.
Conclusion:

1. Reflexes originate in the Brain Stem and Spinal Cord.

2. Dysfunction of reflexes may translate into dysfunction of development.

3. The Masgutova Method is based on reflexes and development following L.S. Vygotsky’s and Svetlana Masgutova’s research.

4. Reflex integration treatment can be integrated into hippotherapy practice.

5. Home programming and tracking sheets will strengthen evidence for the benefits of treatment provided.
Thank you
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