Rhythmic Movement Training
Level 2

Emotions, Memory and Behavior
Please write your name in your manual,
And have your water bottle ready.

Movement Profoundly Affects the Brain & Emotions

... movement is crucial to every other brain function, including memory, emotion, language, and learning. Our “higher” brain functions have evolved from movement and still depend on it.”

—John J. Ratey, MD Harvard Medical School, in User’s Guide to the Brain

RMT Level 2—Overview

- Limbic System—regulates the emotions
- 3 Reflexes related to our emotional state
  - Fear Paralysis Reflex
  - Moro Reflex
  - Tendon Guard Reflex
- Emotional Reactions to RMT
- How RMT affects Limbic System & Prefrontal Cortex
- How RMT helps
  - develop the limbic system
  - release muscle tensions, repressed feelings
  - develop emotional stability
- Work with upper and lower body to achieve balance between thought and feeling
- Experience changes in our own bodies as we do the movements/volunteers

What to do if someone is triggered by movement

- Sometimes, Rhythmic and/or Reflex Integration activities may trigger reactions of dizziness, nausea or intense emotion. If this occurs:
  - Stop, rest and offer any of the following:
    - Hydration, Switching Points, Central Meridian energy
    - Hold Mastoid Process & Navel— for balance
    - Do Cook’s Hook ups (Wayne Cook) or BG Hook Ups
    - Emotional Stress Release (ESR) points— for emotional calm. Light touch on forehead, just above the middle of eyebrow and halfway up to the hairline.

Overview of Limbic System

- Limbic System—limbus means border or margin—the limbic lobe or cingulate gyrus—forms a border around brain stem and reptile brain.
- Regulates emotions, nurturing, play, social behaviors, curiosity
- Maternal behavior of mammals originates here—Paul MacLean called it the Mammalian Brain

Overview of Limbic System

- Amygdala
  - Activates fight or flight response
- Hippocampus
  - Seat of Episodic Memory
  - Develops our individuality
  - Converts short term memory to long term
  - From stem cells that develop into brain cells
- Hypothalamus
  - Controlling center of the inner environment—temperature, hunger, thirst, etc.
- Thalamus
  - Relay Station for sensory information
  - Also Activated when thoughts evoking feelings
  - Important for memory & learning from experience—memory & learning impaired by stress.
How Infants Handle Stress

- Moro Reflex—triggered in a frightened newborn
  Ideally Caregiver hugs, rocks and calms baby and Moro reflex integration occurs.
- Ideally Fear Paralysis Reflex is already integrated in the womb—if not, it is much more difficult to integrate the Moro Reflex—Why?

Importance of Tactile and Vestibular Stimulation

- Tactile, Proprioceptive and Vestibular Stimulation: being nursed, touched and rocked by caregiver
- Integration of the Moro reflex critical for the linking up of the limbic system

“"The main emotional problem of children today is they haven’t moved enough. Many doctors don’t make the link between inactivity and behavior problems.”—Harald Blomberg, MD

Linking up of Limbic System

- Proper limbic system functioning depends on stimulation—especially from senses of:
  - Proprioception
  - Tactile
  - Vestibular
- Rhythmic baby movements provide all three.

Movement is critical for developing proper limbic system functioning. We are designed to experience pleasure while moving.

Stimulation is transmitted through Reticular Activating System (RAS) in brainstem to the Limbic System and then to the Prefrontal Cortex

Promotes transmission of nerve signals through neurotransmitter dopamine.

Motor Function & the Limbic System

- The ability to feel pleasure is essential for motor development.
- Infants feel discomfort or anger when meeting obstacles.
- Gradually babies get more pleasure from moving around, touching and tasting objects and learning to control their bodies and manipulate their surroundings.
- When the motor abilities of the baby develop normally there will be a period of emancipation from the mother at the age of 2-4 years, the assertive or defiant stage.
- Severely handicapped children may miss out on the defiant stage.

Deficient Limbic System Signs

- Lack of assertiveness/initiative
- Inability to say no, compulsive need to please
- Lack of curiosity
- Difficulty with social interaction
- Unwillingness to be touched
- Lack of emotion or exaggerated emotional outbursts
- Extreme defiance or no defiance at all
- Depression
- 9. Fatigue/low muscle tone/poor posture
- 10. Impulsiveness

Autism Limbic System

- Limbic system often underdeveloped in children with autism
  - Impaired social ability
  - Lack of emotion in language
  - Ineffective communication
  - Inability to read emotions
  - Ritualistic behavior/compulsive behavior
    - Limbic system moderates brainstem
    - Prefrontal cortex moderates limbic system
Motor Problems that Typically Coincide with Emotional Challenges

- Poor cooperation between upper and lower body
- Inability to move lower and upper body independently
- Neck and shoulders involved in most movements
- Challenges controlling the lumbar region, excessive stiffness in lumbar area.

The Limbic System and Memory

- Play and imitation of caregivers helps mammals learn
- Episodic memory, helps mammals learn
- Episodic memory located in hippocampus
  - Receives external sensory information from Thalamus
  - Receives internal sensory information from the Vagus Nerve
  - Also encodes what we FEEL about the events of our lives.
- Hippocampus plays a major role in developing our sense of individuality

The Importance of Play for Memory and Learning

- New nerve cells and synapses develop as we play and interact with the world—memories stored in hippocampus.
- During infancy, nerve nets and brain cells grow faster than at any other time in our lives.
- Baby walkers, baby 'bucket' seats and TV can hinder movement and therefore brain development.
- Learning is best done with play and joyful movement.
- Stress increases encephalin in the brain which diminishes pain, increases hyperactivity, and causes destruction of nerve cells which impairs memory.

Switching, Hydration & Central Meridian

- Switching
  - With one hand over navel:
    1. Left to Right Switching Points—rub under collarbone
    2. Top to Bottom Switching Points—rub above and below lips
    3. Front to Back—rub on tailbone
- Hydration—drink water
- Central Meridian Energy—from pubic bone to bottom lip, approx 1 inch away from body

Fear Paralysis Reflex

Early Uterine Reflex

Ideally integrated by the first trimester of womb life—NIM

- FPR Stimulus and Movement Pattern
- Possibly a Cellular reaction of fetus to stress, toxins
- Possibly stimulated by a sudden change in environment, absence of mother, restraint of movement
- Response to stress or perceived threat
  - Freezing reaction, motor paralysis, panic
  - Heart rate decreases, breathing decreases or is held
- Function
  - Survival Response
  - Mechanism for coping with stress
- Possible Connection to SIDS
  - Researcher, Birger Kaada

Fear Paralysis Reflex

Possible Challenges with Un-Integrated FPR

- Low tolerance to stress or change
- Oversensitivity to sudden changes in environment—touch, sound, light, visual stimulus, vestibular or proprioceptive stimulation
- Motion sickness, vestibular sensitivity—Rhythmic Movements can cause dizziness and or nausea
- Adults may have
  - Panic syndromes, social phobias
  - Sometimes blood pressure problems
  - Muscle tension in the neck and shoulder area
- Often linked to un-integrated Moro Reflex
**Fear Paralysis Reflex**  pg. 7

- Children with Un-Integrated FPR may react with:
  - Withdrawal
  - Selective mutism or extreme shyness
  - Oppositional or aggressive behavior
  - Autistic like symptoms
  - Poor adaptability to change, inflexibility
  - Obsessive compulsive behaviors
  - Difficulties making eye contact or staring without blinking
  - Low self esteem

**Factors Contributing to Un-integrated FPR**  page 7-8

- Electromagnetic Radiation
- Environmental Toxicity
- Heavy metal poisoning
- Food intolerance, especially to gluten, casein
- Underlying genetic and/or neurological conditions
- Trauma

For lasting integration of FPR, we may need to work with the above issues in conjunction with RMT.

**Checking FPR**

- Walking Test — Notice if there is:
  - Inability to make eye contact
  - Staring without blinking
  - Holding of breath
  - Tension in the body
  - Clenching of fists (fingers twitching)
  - Swaying
  - Toes curling or twitching

  *Skip the test if it is too stressful*

**Pre-birth Movements for Integrating FPR**

- Best done SLOWLY
- At first, choose 1-3 movements at any given time
- Repeat each movement only 1-3 times
- Not to be done as a series or ‘recipe’; the order does not matter.
- Slowly work up to doing all the movements, but not all at one time.
- Work toward slow smooth, flowing, coordinated movements

**Pre Birth Movements for Integrating FPR—Legs**

**Pre Birth Movements for Integrating FPR—Arms**
Pre Birth Movements for Integrating FPR—Head

Integrating FPR for those who are very fearful or sensitive to sensory & vestibular stimulation

- Do passive rocking first in small amounts—for example 3 or 4 repetitions of rocking. Gradually build up the amount, taking breaks often while doing the movements.
- Do Pre-birth movements using only legs first, in small amounts, i.e. only one repetition.
- Add Pre-birth arm movements in small amounts.

Switching, Hydration & Central Meridian

- Switching
  
  With one hand over navel:
  
  1. Left to Right Switching Points—rub under collarbone
  2. Top to Bottom Switching Points—rub above and below lips
  3. Front to Back—rub on tailbone
  Switch hands during each one.

- Hydration—pull on a tuft of hair and hold; monitor
- Central Meridian Energy—from pubic bone to bottom lip, approx 1 inch away from body

Moro Reflex—Startle Response

Also called “Clinging Reflex” page 13

- Emerges around the 8th week in utero, matured at birth and should be integrated about the age of 4 months—closely linked to FPR
- Movement Pattern—Rapid opening and upward motion of arms and legs with sharp intake of breath & momentary freeze.
- Arms and legs return to flexed position, breath is released usually with a cry

Moro Reflex—Key to Sensory Integration page 13

- When the Moro reflex is triggered the stress hormones cortisol and epinephrine are secreted
- Over time, stress hormones cause:
  - Challenges with proper digestion
  - Possible immune deficiencies, asthma, allergies
  - Adrenal fatigue

- Visual Sense—dilated pupils, that are slow to respond; hypersensitivity to light, tendency to be cross-eyed
- Auditory Sense—hypersensitivity to sound or specific sounds; inability to filter out background noise
- Vestibular Sense—hypersensitivity to movements, motion sickness, problems with balance
- Tactile Sense—hypersensitivity to touch
**Moro Reflex**  page 14

- Possible Challenges with Un-integrated Moro Reflex
  - Withdrawal, shut down of sensory systems
  - Afraid of unfamiliar situations
  - Problems with peer relationships, social skills
  - Anxiety
  - Emotional Outbursts
  - Need to manipulate or dominate others to feel safe
  - Easily triggered from sensory stimulation
  - Fatigue
  - Immune and digestive challenges

**Checking the Moro Reflex**  page 14-15

- Ask permission first

**Movements to integrate the Moro Reflex**  page 16

- Repeat Reflex Pattern-slowly
- Isometric Pressure

**Moro Isometric with Children**

- Ideally both arms and legs push simultaneously
- However, at first you may need to do with arms and legs moving separately

**Passive Moro Isometric**

**What are the Causes for Emotional Reactions to Movement?**  page 36

- EMOTIONAL REACTIONS TO RMT—can be caused by:
  1. Increased stimulation may causelimbic nerve nets to develop, causes changes in emotions, behaviors and hormones
  2. Loosening muscle tensions triggers release of emotions & some people may react with irritation, depression, feelings of vulnerability and intense dreams.

Do small amounts of passive & active movements to quiet Limbic System. Avoid movements of back or hips which trigger emotional release.
What to do in case of Emotional Reactions

- The child needs time to integrate his emotions and it is wise to lower the demands on the child. Child may not act his or her age for a while.
- The child may need a break from some movement, especially those which involve the back and hips like crawling on the stomach, cat arches etc. Moro integration exercises may need to be temporarily suspended.
- The child needs more tactile (massage) and vestibular stimulation by passive rocking or simple active exercises like windscreen wipers, rolling the bottom or sliding on the back.
- Once the “emotional storm” is over, a new level of emotional maturity blossoms. Children and adults become less impulsive, more calm and confident. Better able to work with emotions.

Movements for Cooperation of Upper and Lower Body

- Integration of FPR, Moro, STNR

Movements for Linking Up the Limbic System—Passive & Active

- If extreme emotional reactions occur, take a break and then resume with very little RMT at any given time. Gradually increase amount of movement.

Attack and Defense Behavior—Tendon Guard Reflex

During stress, fight or flight is directed from the amygdala causing:

- When fight or flight response is active:
  - Blood pressure rises
  - Blood flow to large muscles increases
  - Adrenaline and Cortisol are secreted “stress hormones”
  - Breath Holding
  - Diaphragm and respiratory muscles contract

- The Tendon Guard reflex protects the tendons from too much tension during a Fight and Flight pattern.
- What is the relationship to Moro Reflex?

Attack and Defense Behavior and the Tendon Guard Reflex

- Defense mechanism during Fight or Flight pattern

  Protects tendons & muscles from too much tension
  Posture changes:
  - Flexor muscles contract
  - Calf muscles shorten
  - Knees lock
  - Rise up on toes
  - Neck and Back muscles contract to keep body upright

  Tendon Guard is active with chronic stress or repressed emotions,
  Over time causes tensions in legs, feet, spine, hips, neck & shoulders, chest and core—
  “Muscle Armoring” —tension in the respiratory system, diaphragm

Muscle Armoring with Emotional Stress—

- Feelings of fear, sadness and aggression may be repressed by contracting the skeletal muscles and the diaphragm
- Constant emotional stress may cause chronic muscle tensions of the legs, hips, back, shoulders, neck and diaphragm.
- Relaxes the muscle tensions with RMT exercises may release emotions that have been repressed.

(Blomberg)
Rhythmic Movements to relax muscle tension in the legs and feet

Related Reflexes —
TLR, Babinski, Amphibian and Landau

Rhythmic Movement to relax and integrate the lumbar spine and hips

Related Reflexes —
Spinal Galaott, Landau , STNR, ATNR (Level 3)

Relaxing stiffness and immobility of the spine

Related Reflexes —
TLR, Landau, STNR

Movements for relaxation of tension and fixation of the neck and shoulders

Related Reflexes —
TLR, STNR, Moro, FPR, ATNR (Level 3), HR (Level 3)

Prefrontal Cortex—“CEO”
Highest level Coordination between thought and feeling

- Processes sensory input
- Gives complex analysis & complex responses to input
- Closely connected to Limbic system, cerebellum, basal ganglia, RAS—proper functioning requires proper stimulation
- The ability of being motivated for a goal, stick to it, judge what is relevant or not, control impulses, follow rules, to connect the present to the past and plan for the future.
- Executive functions mature gradually up till the age of 25 years

Body Posture and Emotions
Integrating Postural Reflexes may help the function of the PFC
Connection between Prefrontal Cortex and Limbic System  pg. 40-42

- The prefrontal cortex receives information from the limbic system about the inner conditions of the body, hunger, thirst, feelings of pleasure etc.
- PFC moderates emotions and motivation
- PFC is responsible for impulse control and the ability to stay on track to achieve a goal

Prefrontal Cortex  page 40-41

- Abilities associated with PFC
  - Planning/foresight
  - Motivation-awareness of inner drives
  - Impulse control
  - Making judgments/decisions
  - Abstract thinking
  - Speech development
  - Eye movement development/reading skills
  - Reading comprehension
  - Attention/sustained focus
  - “Memory of the future”, i.e. awareness of consequences of actions
  - Logical thinking, mathematic skills
  - Moderates emotions, esp. anger (moderates limbic activity)

Challenges with Underdeveloped Prefrontal Cortex

- Shallow emotional reactions, passivity, apathy and indifference.
- Impulsivity and aggressive outbursts as well as poor foresight of the consequences of ones actions.
- Problems understanding social codes.
- Tactlessness
- Lack of empathy.
- Lack of foresight.
- Need for instant gratification.
- Difficulty shifting attention

The Disposition of the Limbic System to Sensitization,  page 42

- Sensitization: The limbic system functions like an amplifier that can increase the intensity of our feelings over time during triggering events, causing fits of emotion like anger, fear, laughing etc.
- The prefrontal cortex should normally be able to control such reactions.
- If the emotions are very strong or the prefrontal cortex is not properly linked up it may not be able to control such fits of emotions.

Integrating Function of the Prefrontal Cortex  part 1, page 43
How Rhythmic Movements Can Help with Autism and other challenges

Provide stimulation to develop brainstem, cerebellum, basal ganglia, limbic system and prefrontal cortex AND the linking up of all these systems.

- The speech areas of Wernicke and Broca (yellow) have close connections with the cerebellum.
- In insufficient stimulation of the speech areas from the cerebellum speech will be delayed or not develop
- The rhythmic exercises will quicken speech development in autistic children

How Rhythmic Movements Help with Autism

Provide stimulation to develop brainstem, cerebellum, basal ganglia, limbic system and prefrontal cortex AND the linking up of all these systems.

- Limbic System: Rhythmic exercises will quicken the emotional development and improve bonding, body contact, play and social interaction. Children will start to defy and assert themselves.
- Prefrontal Cortex: Rhythmic exercises will improve the function of the prefrontal cortex and symptoms will gradually decrease

(Blomberg)

Psychiatric Research on RMT

- I started private practice and a colleague invited me to introduce the movement training for some severely ill chronic schizophrenic patients, most of them hospitalized for ten years or more at the psychiatric hospital where he worked. After two years a report was compiled in 1993 dealing with “short term changes in chronic schizophrenic patients treated with rhythmic movement therapy.”
- “the study indicates that the patients treated with movement therapy had displayed the greatest positive changes… Among other things the changes manifested themselves in the fact that these patients to a greater extent were able to take part of social activities, participate in occupational therapy and their daily tasks in the ward. They had also become more interested in their surroundings.” (Blomberg)

Congratulations & Thank You