

PRIMITIVE REFLEXES

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*Sally Goddard
Sam Berne, O.D.
Carol Marusich, O.D.
Thorkild Rasmussen
Lena Reuterhall*

*Ana Vargas
Al Sutton, O.D.
Baxter Swartwout, O.D.
Harry Wachs, O.D.
Mary Witkowski*

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GENERAL CONCEPTS

- Primitive reflexes are movement patterns directed from the level of the brain stem and, therefore, not under conscious, volitional control.
- Emerge during pre-through early post-natal development
- Reflexes present at birth are designed to insure immediate response to the new environment. These reflexes are automatic, stereotyped, directed from the brain stem and have no cortical involvement. They should only have a limited life span, and should eventually be integrated.
- Should become integrated into more complex patterns of movement during the first year of life.
- Reflexes are the alphabet of movement that build and combine together to create more varied patterns of movement.
- Through the emergence of the reflexes, righting reactions, and equilibrium responses, physiological flexion and extension are integrated into the background of normal postural tone so that more sophisticated voluntary movements based upon these early motor patterns can develop.
- If retained, the reflexes are aberrant and show structural weakness or immaturity within the central nervous system. They can prevent development of the succeeding postural reflexes. They may result in immature patterns of behavior or may cause immature systems to remain prevalent, despite the acquisition of later skills.
- One of the possible underlying causes of academic and/or visual problems may be the retention or inadequate integration of one or more of the primitive reflexes.
- The retention of primitive reflexes may also cause poor organization of both gross and fine motor skills. Sensory perception, cognition and avenues of expression may suffer.
- Integrating the primitive survival reflexes can help many patients make faster gains in their Vision Therapy program.

UNDERSTANDING PRIMITIVE REFLEXES (Goddard)

Moro Reflex

Emerges: 9 weeks in utero

Birth: fully present

Inhibited: 2-4 months of life

TRIGGERS:

- Sudden, unexpected occurrence of any kind
- Stimulation of the labyrinth by change in head position (Vestibular)
- Noise (Auditory)
- Sudden movement or change of light in the visual field
- Pain, temperature change, or being handled too roughly (Tactile)



PHYSICAL RESPONSE TO THE MORO REFLEX

- Instantaneous arousal
- Rapid inhalation, momentary “freeze”, or “startle” followed by expiration—often accompanied by a cry
- Possible outburst, e.g. anger or tears
- Activation of “fight or flight” response, which automatically alerts the sympathetic nervous system and results in:
 - Release of adrenaline and cortisol into the system (the stress hormones)
 - Increase in the rate of breathing, particularly in the apices (upper lobes) of the lungs (Hyperventilation)
 - Increase in heart rate
 - Rise in blood pressure
 - Reddening of the skin

SYMPTOMS SUGGESTIVE OF A RETAINED MORO REFLEX:

- Vestibular related problems such as motion sickness, poor balance and coordination, particularly seen during ball sports
- Physical timidity
- Oculomotor and visual-perceptual problems e.g. Stimulus bound effect (cannot ignore irrelevant visual material within a given visual field, so the eyes tend to be drawn to the perimeter of a shape, much to the detriment of perception of internal features).
- Poor pupillary reaction to light, photosensitivity, difficulty with black print on white paper. The child tires easily under fluorescent lighting
- Possible auditory confusion resulting from hypersensitivity to specific sounds. The child may have poor auditory discrimination skills, and may have difficulty shutting out background noise.
- Allergies and lowered immunity, e.g. asthma, eczema, or a history of frequent ear, nose and throat infections.
- Adverse reactions to drugs
- Poor stamina
- Dislike of change or surprise—poor adaptability
- Poorly developed CO₂ reflex – holds breath
- Reactive hypoglycemia

POSSIBLE SECONDARY PSYCHOLOGICAL SYMPTOMS:

- Free floating anxiety - “Angst” (continuous anxiety seemingly unrelated to reality)
- Excessive reaction to stimuli
 - Mood swings - labile emotions (frequent changes)
 - Tense muscle tone - (body armoring)
 - Difficulty accepting criticism
 - Resistant to change
- Cycle of hyperactivity followed by excessive fatigue
- Difficulty making decisions
- Weak ego, low self-esteem
 - Insecurity/Dependency
 - Need to control or “manipulate” events

While other residual reflexes tend to have an impact on specific skills, it is the Moro which has an overall effect on the emotional profile of the child.

If the Moro reflex is not inhibited at the correct time it can be transformed into the Adult Startle Reflex. This reflex consists of a quick shrugging movement, followed by a turn of the head to check for the source of the disturbance.

SCHOOL PROBLEMS:

Over-reactive; Hypersensitive; Stimulus bound; Difficulty with ball sports

Tonic Labyrinthine Reflex

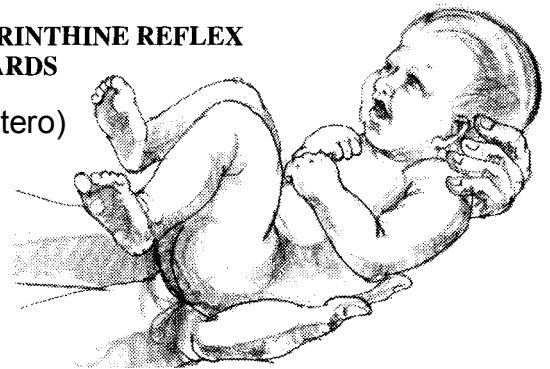
TONIC LABYRINTHINE REFLEX (TLR) FORWARDS

(Forward)

Emerges: in utero — flexus habitus (position of the baby in utero)

Birth: present

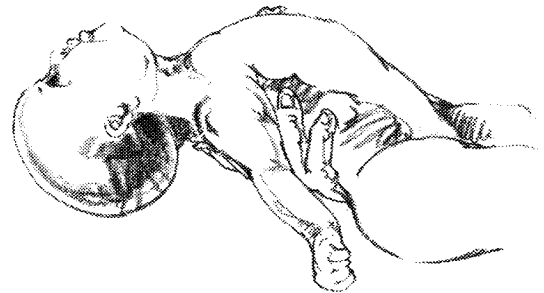
Inhibited: approximately 4 months of Life



(Backward)

Emerges: at birth

Inhibited: Gradual progression from 6 weeks up to 3 years of age, involving the simultaneous development of postural reflexes, Symmetric Tonic Neck reflex and the Landau reflex



The TLR is closely linked with the Moro reflex, both vestibular in origin, stimulated by any alteration of space. Extension of the head below the level of the spine causes immediate extension of the arms and legs. This reflex helps the baby “straighten out” after birth. Balance, muscle tone and proprioception are all trained during the birthing process.

Can prevent head-righting reflexes from fully developing; may also prevent the child from creeping on his hands and knees, which is crucial to subsequent development of balance, spatial relationships, and vision.

SYMPTOMS SUGGESTIVE OF A RESIDUAL TONIC LABYRINTHINE REFLEX (forward):

- Poor posture - stoop
- Hypo tonus (weak muscle tone)
- Vestibular related problems
 - Poor sense of balance
 - Propensity to get car sick
- Dislike of sporting activities, physical education classes, running, etc.
- Oculomotor dysfunctions
 - Visual-perceptual difficulties
 - Spatial problems
- Poor sequencing skills
- Poor sense of time

SYMPTOMS SUGGESTIVE OF A RESIDUAL TONIC LABYRINTHINE REFLEX (backward):

- Poor posture - tendency to walk on toes
- Poor balance and coordination
- Hyper tonus - stiff, jerky movements because the extensor muscles exert greater influence than the flexor muscles
- Vestibular related problems
 - Poor sense of balance
 - Tendency to motion sickness
- Oculomotor dysfunction
 - Visual-perceptual difficulties
 - Spatial perception problems
- Poor sequencing skills
- Poor organizational skills

SCHOOL PROBLEMS

- Poor balance
- Rigid or floppy muscle
- Ocular-dysfunctions
 - Tracking
 - Convergence
- Re-establishment of binocular vision
- Visual perceptual difficulties
- Possible auditory problems
- Organizational problems
- Poor sense of time and rhythm

Spinal Galant

Emerges: 20 weeks in utero
Birth: actively present
Inhibited: 3-9 months of life

If the baby is held in the ventral (lying on tummy, head and hips not supported) or placed in the prone position, stimulation of the back to one side of the spine will result in hip flexion (rotation) to 45 degrees toward the side of the stimulus. It should be present equally on both sides

This reflex may help in the birthing process

SYMPTOMS SUGGESTIVE OF A RETAINED SPINAL GALANT REFLEX

- Fidgeting - elastic in waistband or back of chair may activate the reflex during school
- Bedwetting - stimulation of both sides of the spine simultaneously elicits a related reflex causing the child to urinate
- Poor concentration
- Poor short-term memory - reflex is so prevalent that this constant irritant is always vying for the child's attention.
- Hip rotation to one side when walking

SCHOOL PROBLEMS

Inability to sit still or remain silent
Poor concentration
Continued bed wetting above the age of five years



Asymmetric Tonic Neck Reflex

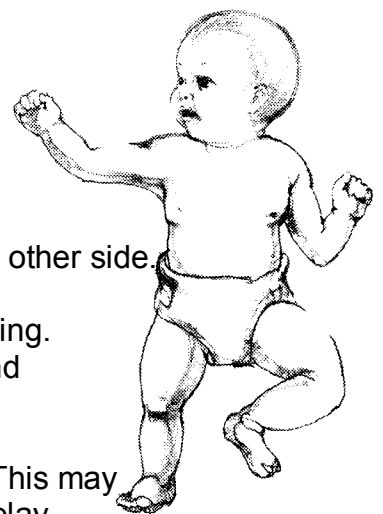
Emerges: 18 weeks in utero
Birth: Fully present
Inhibited: About 6 months of life

Movement of the baby's head to one side will cause extension of the arm and leg to the side to which the head is turned and flexion of the limbs on the other side.

This reflex in utero develops muscle tone and vestibular stimulation, and kicking. It also provides continuous motion that stimulates the balance mechanism and increases neural connections.

This reflex assists in the birthing process and the birth process reinforces it. This may be one reason that C-section babies are at a higher risk for developmental delay.

ATNR leads to crawling with a fluent cross pattern movement. Crawling and creeping are important for hand-eye coordination, being able to cross the midline, and integration of the vestibular with other senses. Myelination of the central nervous system is also enhanced by activation of ATNR.



SYMPTOMS SUGGESTIVE OF A RETAINED ATNR

- Balance may be affected as a result of head movement to either side
- Homolateral, instead of a normal cross-pattern movement, e.g. when walking, marching, skipping, etc.
- Difficulty crossing the midline
- Poor ocular “pursuit” movements, especially at the midline
- Mixed laterality - (Child may have mixed foot, hand, ear dominance)
- Poor handwriting and poor expression of ideas on paper
- Visual-perceptual difficulties, particularly in symmetrical representation of figures

SCHOOL PROBLEMS

Handwriting, Expressing ideas in written form, Eye tracking problems, Difficulty crossing the midline

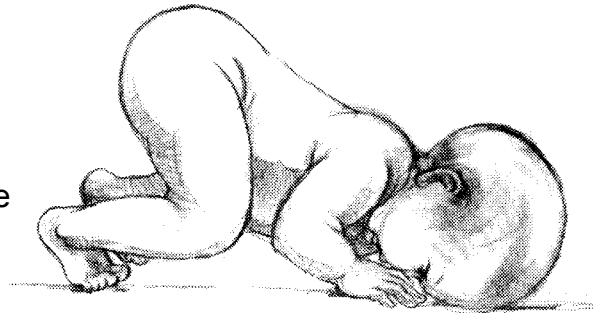
Symmetric Tonic Neck Reflex

Flexion

Emerges: 6-9 months of life

Inhibited: 9-11 months of life

When the child is in the quadruped position, flexion of the head causes the arms to bend and the legs to extend.



Extension

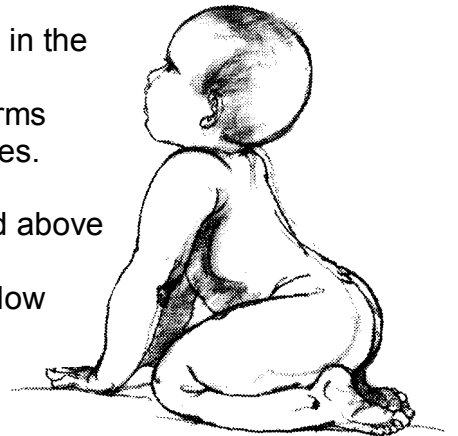
Emerges: 6- 9 months of life

Inhibited 9-11 months of life

Head extension, on the other hand, causes the legs to flex and the arms to straighten

This reflex helps the baby defy gravity by rising up - on hands and knees in the prone position. Possibly not even a true reflex, but a crucial stage of the labyrinthine – at the very least it inhibits the tonic labyrinthine reflex. It forms the “bridge” to the next stage of locomotion - creeping on hands and knees.

In relation to vision: by bending of the legs as a result of head being lifted above the spine, this encourages the infant to fixate the eyes at far-distance. Bending of the arms in response to flexion of the head (head lowered below the level of the spine) will automatically bring the child’s focus back to near-distance. This reflex helps to complete a sequence of near ↔ far eye training.



ATNR begins by extending the baby’s ability to focus from about 7 inches at birth to arms length. As the ATNR reflex is inhibited (6 months) and the STNR reflex emerges the visual field is extended to distant objects.

The importance of creeping: It helps the eyes to cross the midline - as the hands are the visual targets. This is essential for being able to read without skipping words as the eyes move across the middle of the line of text.

Without creeping there would be no sense of balance, space or depth. (Goddard)

SYMPTOMS SUGGESTIVE OF A RESIDUAL SYMMETRIC TONIC NECK REFLEX

- Poor posture
- Tendency to “slump” when sitting, particularly at a desk or table
- Simian (ape like) walk
- “W” leg position when sitting on the floor
- Poor hand-eye coordination
- messy eater
- “clumsy child” syndrome
- Difficulties with readjustment of binocular vision. (Child cannot change focus easily from blackboard to desk)
- Slowness at copying tasks
- Poor swimming skills p

SCHOOL PROBLEMS

Posture-lies on desk when writing, Poor eye-hand coordination, Problems with refocusing from far to near distance, Clumsy

Palmar Reflex

Emergence: 11 weeks in utero

Birth: Present

Inhibited: 2-3 months

Transformed: Gradually developed from involuntary grasp to voluntary grasp-release and finger control. By 4-6 months the child should be able to hold an object between thumb and index finger in a pincer grasp

There is a direct link between the Palmar and sucking reflexes in the early months of life. The Palmar may be elicited by sucking movements and the action of sucking may cause kneading of the hands in time to the sucking movements (Babkin response).

The effects of this neurological loop which connects the hands with movements of the mouth can often be seen when the child first learns to write or draw.



SYMPTOMS SUGGESTIVE OF A RESIDUAL PALMAR REFLEX

- Poor manual dexterity. The Palmar reflex will prevent independent thumb and finger movements
- Lack of “pincer” grip, which will affect pencil grip when writing
- Speech difficulties – continuing relationship between hand and mouth movement via the Babkin response will prevent the development of independent muscle control at the front of the mouth, which will then affect articulation
- Palm of the hand may remain hypersensitive to tactile stimulation
- Child makes movements with mouth when trying to write or draw.