

# Reflex Integrtation

# GLOSSARY



**Primitive Reflexes:** are involuntary movement patterns that are present at birth and become dormant or "integrated" before the child reaches 12 months of age. Most reflexes become integrated into a pattern of movement after infancy, so more mature and voluntary movements can emerge.

**Moro Reflex:** is a primitive reflex pattern that typically emerges in utero and integrates approximately four months after birth. It is an involuntary reaction to what is perceived as an outside threat. The threatening stimuli can come in via touch, sound, or the feeling of being dropped, which creates a sense of falling. When the child senses these sensations, the reflex causes the fanning and clenching of fingers, spreading or extending the extremities, followed by a quick flexion of extremities, and crying or anger.

**Asymmetrical Tonic Neck Reflex (ATNR):** is a primitive reflex pattern that usually emerges in utero, around 18 weeks, is fully present at birth, and integrates approximately six months after birth. The ATNR is an involuntary reaction to a head turning to one side. ATNR is active when a head turn to one side, causes the arm and leg; the head turned towards to extend (stretch), while the opposite arm and leg, the head turned away from to flex (bend).

# GLOSSARY



**Symmetrical Tonic Neck Reflex (STNR):** is a primitive reflex pattern that usually emerges in utero and continues to develop after birth. It becomes active approximately six months of age and starts to integrate at approximately ten months of age. The STR is an involuntary reaction to downward and upward movement of the head. There are two STR positions. Position 1 is a downward head movement which causes the elbows to flex and the legs to extend. Position 2 is an upward head movement (also called Sphinx Position) which causes the elbows to extend and the legs to flex.

**Tonic Labyrinthine Reflex (TLR):** is a primitive reflex pattern that usually emerges in utero and continues to develop after birth. The TLR is an involuntary reaction to the forward and backward movement of the head. There are two types: TLR Forward and TLR Backward. TLR Forward occurs when the head is in front of the spine, causing the arms and legs to flex and tuck inward. TLR Backward occurs when the head is behind the line of the spine, causing the arms and the legs to extend and the back to arch and stiffen.

# GLOSSARY



**Rooting Reflex:** is a primitive reflex pattern that typically emerges in utero and integrates approximately three to four months after birth. When the baby's mouth or cheek is stroked, the head turns toward the stroke, and the mouth opens in search of stimuli. If the mouth finds something to grab, the mouth closes over it, and the sucking motion begins.

**Palmer (Grasp) Reflex:** is a primitive reflex pattern that emerges in utero, at approximately 11 weeks gestation, and integrates approximately 12 months after birth. When the infant's palm is stroked at the base of the fingers, the fingers close into a firm grasp starting from the pinky finger.

**Spinal Galant:** is a primitive reflex pattern present in the womb and that integrates at approximately 9-12 months of age. When the right or left side of the back below the waist is stroked, the sensation causes the child to side bend towards the touch.

# GLOSSARY



**Retained Reflexes:** are primitive reflexes that are actively present when they should have been inhibited (dormant).

**Motor Learning:** a neurological ability to learn new movement skills through practice and repetition.

**Motor Planning:** is the ability to understand, plan, and execute a multiple steps movement activities in the correct order.

**Eye-Hand coordination:** (also known as hand-eye coordination) is the ability to process visual input to guide the hands to achieve a specific task (e.g. reaching and grasping).

**Extension:** straightening of body parts.

**Flexion:** bending of body parts.

# GLOSSARY



**Proprioceptive sense:** an internal sense of body movement and posture wherein we are in space in relation to other objects and the ability to orient self accordingly.

**Right/Left Discrimination:** is an internal or external spatial perception, interpretation, and differentiation of sensory information that originated from the left and right side of the body.

**Peripheral Vision:** is the eyes' ability to use side vision while gazing straight ahead.

**Postural Reflex:** are mature patterns of responses that control balance, motor coordination, and sensory motor development.

**Sensory Integration:** is a term developed by Jean Ayers, which explains how the brain receives, perceives, and reacts to sensory information either from inside or outside the body. She defines sensory integration as "The neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment."

# GLOSSARY



**Spatial Orientation:** is the brain's ability to orient self to the ground with or without vision.

**Vestibular sense:** the body's sense of balance and movement.

**Visual Tracking:** is the ability to maintain a visual gaze on a moving object or on a predictable line while reading.

**Visual Discrimination:** is the ability to recognize details in what is being seen while identifying similarities and differences.

**Wilbarger Brushing Protocol:** was developed by occupational therapist, Patricia Wilbarger. WBP is a treatment method wherein a child's skin is brushed using a surgical brush in a specific manner throughout the day to desensitize tactile defensiveness.

## What are primitive reflexes ?

- Reflexes are normal, involuntary movement patterns that promote **motor learning** and **sensory integration**.

**Motor learning** is a neurological ability to learn new movement skills through practice and repetition.

**Sensory integration** is the mind and body's ability to perceive internal and external information through the senses, learn, respond, and adapt accordingly.

Our senses include but not limited to sight, hearing, taste, smell, touch, vestibular (sense of movement and balance), and proprioceptive (body awareness).



- **Primitive reflexes** are involuntary movement patterns that are present at birth and become **dormant**, or "**integrated**," before the child reaches 12 months of age. Most reflexes become integrated into a pattern of movement after infancy, so more mature and voluntary movements can emerge. However, sometimes reflexes do not become integrated and interfere with a child's ability to develop an appropriate foundation for stability and mobility. Therefore, a child without integrated primitive reflexes may learn faulty and maladaptive movement patterns (Oden,2004).

Primitive reflexes are involuntary movement patterns controlled by the brain stem and executed without reaching the cortical or conscious part of the brain. Primitive reflexes emerge in **utero**, and integrate before the child reaches about 12 months of age. These reflexes include the **Moro Reflex, Rooting Reflex, Palmar (Grasp) Reflex, Asymmetrical Tonic Neck Reflex (ATNR), Spinal Galant Reflex, Tonic Labyrinthine Reflex (TLR), and Symmetrical Tonic Neck Reflex (STNR).**



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## The Benefits Of Reflexes

Primitive reflexes are necessary during the **birthing process**, and they are key to the infant's first-year survival. Instinctively, the infant responds to the world via the primitive reflexes.

Together the reflexes help the infant:

1. move through the birth canal
2. take his or her first breath,
3. instinctively withdraw from hazardous stimuli
4. urinate, creep, grasp
5. lift their heads
6. open their mouth
7. suck and swallow
8. kick

# The Benefits Of Reflexes



- Each primitive reflex has its benefits and is a building block to the infant's future movement patterns and how he or she perceives the world via the senses. Therefore, primitive reflexes also impact emotional development. In a healthy and typically developing brain, the infant slowly begins to integrate these reflexes naturally, and they become dormant, so a more mature reflex pattern called the "postural reflexes" can develop.

## What are postural reflexes ?

- Postural reflexes are mature patterns of responses that control balance, motor coordination, and sensory motor development. Postural reflexes succeed primitive reflexes, and retention of the latter will affect the child's development. It is challenging to work on the child's postural reflexes, for instance, without first going back and making sure the brain has integrated the primitive reflexes. For this reason, therapists should start treatment with primitive reflex screening and integration programs to set a solid developmental foundation.

In cases where there is the presence of trauma, genetic abnormality, chronic illness, developmental delays, or pregnancy or birthing complications, primitive reflexes may still be actively present in the child's body. If primitive reflexes are actively present when they should be inhibited, they are called "retained reflexes." Retained reflexes will continue to cause involuntary movement patterns or physical responses that will in turn cause faulty learning processes .Also, as the baby continues to grow, he or she begins to perceive the world in an immature way, and behavioral challenges may follow.

When a child's brain is healthy and developing typically, maturation and growth are automatic. The child goes through natural and instinctive movement patterns that assist the brain in learning and integrating primitive reflexes. We see confusion in the brain when the child either does not go through the typical milestones or skips them altogether. For example, when a child moves from sitting to walking, skipping the crawling phase, an essential process for brain integration, this jump in development can confuse further development which requires the right and left the brain to coordinate to execute more advanced movement activities.

Every natural developmental stage is essential, and the brain uses each one for critical learning and essential growth. Similarly, a skilled therapist can integrate retained reflexes by following the natural developmental process and mimicking activities and movements that were missed or done incorrectly in the child's previous stages to help the brain rewire itself.



## What causes primitive reflex to not integrate?!

Not a lot of definitive research has been done to determine exactly why primitive reflexes may be retained. However, there have been some potential factors identified:

- **Trauma during pregnancy**
- **Trauma during and/or after birth**
- **Exposure to toxins, drugs, tobacco in utero**
- **Stroke in utero**
- **Caesarean section delivery**
- **Premature birth**
- **Prolonged jaundice**
- **Problems with feeding within the first 6 months of life**
- **Developmental motor delays**
- **Minimal floor time as an infant**



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# MORO Reflex

## A.WHAT IS THE MORO REFLEX?

The Moro reflex is a primitive reflex pattern that typically emerges in utero and integrates approximately four months after birth. It is an involuntary reaction to what is perceived as an outside threat. The threatening stimuli can come in via touch, sound, or the feeling of being dropped, which creates a sense of falling.

- Threatening sensory stimuli includes:
- Sudden, loud noises
  - Sudden change or movement in the visual field
  - The feeling of being dropped or startled

➤ Motor response includes:

- Fanning and clenching of fingers
- Spreading or extending the extremities
- Followed by a quick flexion of extremities
- Crying and/or anger

➤ Other physical responses include

- Quick inhalation
- Startling or freezing
- Arousal
- Fight or flight responses
- Sympathetic nervous system activation
  - Increased heart rate, blood pressure, and breathing
  - Adrenaline & cortisol release (stress response)

## B. BENEFITS OF THE MORO REFLEX



- Moro is the first primitive reflex to emerge, and it is necessary for an infant's survival.
- Right after birth, the Moro reflex helps the infant take the first breath.
- It also helps protect the infant from dangerous environmental stimuli by causing physical and behavioral responses that help the child withdraw from a threatening stimulus.
- The infant pulls away or cries, and, without this primitive reflex, caregivers would not immediately respond to an infant's distress, and provide the necessary comfort.
- Therefore, it is crucial that we observe the Moro active in an infant's first few months of life. At approximately four

## B. BENEFITS OF THE MORO REFLEX



- Therefore, it is crucial that we observe the Moro active in an infant's first few months of life. At approximately **four months**, the Moro reflex will start to **integrate** and a more mature **Startle reflex develops**.
- Instead of relying on the extension and flexion responses of the Moro reflex, the infant will transition to **the Startle and Grasp reflex**. When this transition is not smooth and the Moro continues to **persist**, the infant's developmental process will be **affected**.

## C. RETAINED MORO REFLEX SYMPTOMS AND BEHAVIORS :



- Moro is the **only** primitive reflex connected to all other senses, and it is considered a building block to all the other reflexes and overall development. Because the Moro triggers the sympathetic nervous system, it affects the adrenal glands and the production of stress hormones, changing the emotional and physical state of the child.
- When **retained** past the necessary time, the Moro puts the body in a constant **fight or flight state** and causes many adverse symptoms in the body. Also, when the adrenal glands are continuously bombarded with fight or flight signals, they begin to fatigue, and secondary health symptoms, such as reduced immune system and allergies, emerge.

# Signs and symptoms of a retained Moro reflex:



- Sensitivity to sound (auditory defensiveness)
- Poor coordination
- Reduced attention
- Poor balance
- Gravitational insecurities, excessive fear of falling and height
- Motion sickness
- Difficulty tuning out background noise
- Visual perceptual problems
- Increased distractibility

# Signs and symptoms of a retained Moro reflex:



- Easily startled and fearful in new situations
- Overreacting
- Increased "fight or flight" responses or anxiety
- Distractibility
- Hypersensitivity to touch
- Light sensitivity
- Difficulty making decisions
- Difficulty with social skills
- Behavioral and emotional issues
- Low immune system (e.g. allergies, adrenal fatigue, and food sensitivities)



# TABLE #1 SYMPTOMS AND BEHAVIOR CHECKLIST:MORO REFLEX



- Observe the child and circle the number that best represents the severity of the symptoms you observe. You can use this checklist as a screen to gather an initial baseline and then again 6-12 weeks after intervention to assess progress.
- Note: Usually one retained reflex leads to retention in other reflexes. To be safe, work on all of the primitive reflexes. Before working with a child, go through the symptoms checklist, and rate the severity of the symptoms or behaviors on a scale of 0-5, 0 being "not seen" to 5 being "severe."

# TABLE #1 SYMPTOMS AND BEHAVIOR CHECKLIST: MORO REFLEX



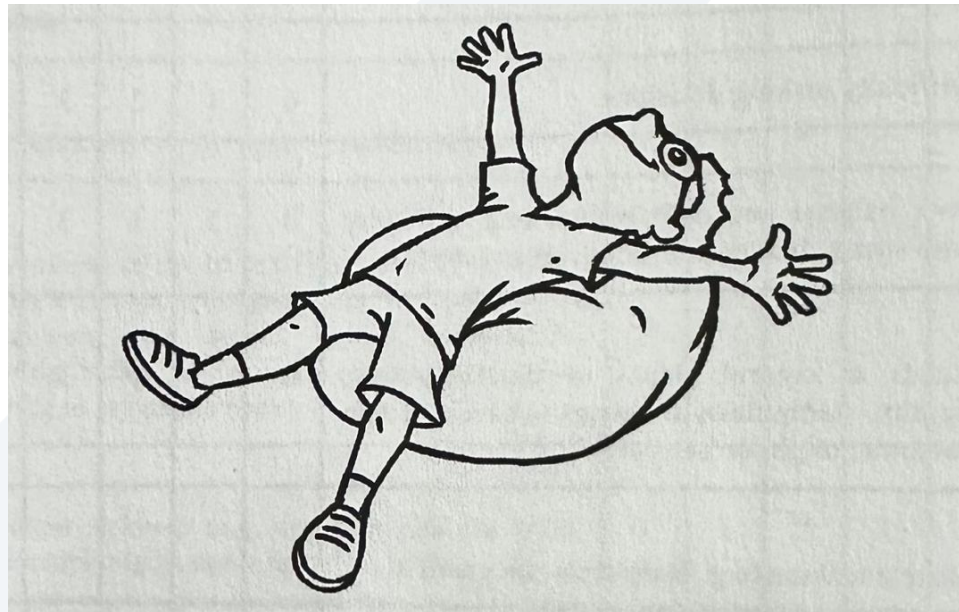
Scoring guide: zero being not observed to 5 being observed as severe.

	Symptoms and Behaviors	0	1	2	3	4	5
1	Hypersensitivity to light	0	1	2	3	4	5
2	Hypersensitivity to sound (e.g. poor auditory discrimination skills, difficulty tuning out noises)	0	1	2	3	4	5
3	Hypersensitivity to touch or sudden touch	0	1	2	3	4	5
4	Hypersensitivity to activities during which a child's feet leave the ground or the head is tilted backward (e.g. avoids swings, somersaults, during bath time to wash hair or even when trying to lay on the back)	0	1	2	3	4	5
5	Motion sickness (e.g. does not like car rides, feels sick easily, and nausea)	0	1	2	3	4	5
6	Overreacts to routine circumstances and events (e.g. may react aggressively and/or strongly)	0	1	2	3	4	5
7	Difficulty calming down, becomes easily distressed (e.g. emotional outbursts, needs extra time to feel safe and calm down)	0	1	2	3	4	5
8	Anxiety	0	1	2	3	4	5
9	Easily distracted by surroundings	0	1	2	3	4	5
10	Impulsive and/or aggressive	0	1	2	3	4	5
11	Emotional immaturity	0	1	2	3	4	5
12	Withdrawn, timid, or appears fearful toward change and transition	0	1	2	3	4	5

13	Exhibits ADD or ADHD tendencies	0	1	2	3	4	5
14	Difficulty with social skills (e.g. may appear fearful to join in or doesn't know how to join a game with friends; extra difficulty with age-appropriate interactions, becomes anxious and worried when anticipating others' reactions)	0	1	2	3	4	5
15	Depression and/or feeling down	0	1	2	3	4	5
16	Difficulty making decisions	0	1	2	3	4	5
17	Poor balance and coordination (e.g. difficulty with sports, ball games, climbing structures)	0	1	2	3	4	5
18	Needs to control games or outcomes (e.g. rigidity, manipulates situations to have a certain outcome, might be insecure)	0	1	2	3	4	5
19	Muscle tension (e.g. body feels "on guard")	0	1	2	3	4	5
20	Other health issues (e.g. allergies, asthma, and adrenal fatigue, poor digestion, or food sensitivities)	0	1	2	3	4	5

## THE STARFISH EXERCISE SCREEN

- You can use the following Starfish exercise as part of the screening process to determine if further testing is needed.
1. Parent or therapist should first demonstrate the starfish exercise (refer to exercises #1 and #2).



## THE STARFISH EXERCISE SCREEN

2. Have the child sit on a chair or beanbag, and ask them to curl up. They might cross opposite arms and legs for the first try. Observe and note these patterns



## THE STARFISH EXERCISE SCREEN

3. Show them how to curl up by crossing the right leg over the left leg and right arm over the left arm.
4. Ask them to do the exercise as demonstrated on the opposite side.



Inability to perform this exercise well may be a sign of a retained Moro reflex.

# INTERVENTION AND TREATMENT PLANNING



Choose an intervention method that works best for each child. One of the best ways to help integrate primitive reflexes is by mimicking early childhood movement patterns. The exercises compiled in this book are for those who are receiving occupational therapy or other reflex integration treatments. Use them as a daily home program and as movement breaks in a school setting with the help of a trained professional.

Note: With a retained Moro reflex, the child will continue to be stimuli-responsive or hypersensitive to sounds, sudden movement, etc. While working to integrate the Moro, advise and educate teachers and care providers to be sensitive to the child's sensory needs. The following are some strategies and accommodations to support the child during Moro integration therapy.

## ACCOMMODATIONS

A child with retained Moro reflex is over-reactive to stimuli and reacts emotionally. Choose one or more of the following accommodations to meet the child's needs.

1. Create a safe home/office environment or non-threatening classroom.
2. Create structure and consistency for the day. A clear structure makes a child's day predictable and reduces stress.
3. Use a visual schedule the child can refer to throughout the day.
4. Reduce noises to a minimum. Use sound-reducing headphones during focused work time, but do not make a habit of having the child wear them all the time.
5. Reduce the level of sudden movements (visual stimuli) to a minimum. Place the child in a corner where nothing can "sneak out" behind him.

## ACCOMMODATIONS

6. Position the child away from busy classroom areas. Face the door instead of their back to the door.
7. Use positive reinforcement. Retained Moro heightens the emotional state and makes self-esteem a big issue, so do not focus on the child's shortcomings, but instead work on building confidence by reinforcing his or her strengths.
8. Do not force activities that might trigger anxiety in the child. Instead, break down tasks, and slowly build on them.
9. Provide frequent movement breaks that target the Moro reflex. Make the child's daily tasks accessible and flexible to accommodate movement breaks.
10. Position the child away from alarms and speakerphones.



# EXERCISES TO PROMOTE MORO REFLEX INTEGRATION



The exercises below can be used in the order you think is best for your student/child. Follow the order presented here, or combine your exercises with others during your session. The manner in which you utilize the exercises depends on the environment, the child's State, and materials you have on hand.

For example mean, the activities fun and exciting when working with younger children, but feel free to create more of a workout session with older Sie, rats and adults.

Avoid and anxiety. As much as possible, try do make the exorcises fun and enjoyable. For kids who are younger and refuse to cooperate, incorporate the use of positive reinforcement or rewards to encourage participation .

Note: the exercises challenge more than one of the primitive reflexes, including the Moro reflex, encourage bilateral coordination, spatial awareness, and motor planning skills. Do these games and activities during the child's therapy sessions, daily movement breaks, and home exercise program.