Primitive Reflexes: Child under 3

What is a Primitive Reflex?

A primitive reflex is a neurological arc that has a specific stimulus and predictable response(s). They help to lay a foundation for the nervous system and work with it throughout life. They help to develop the nervous system and help with our survival. Ideally, when they are not needed, they disappear, or integrate, until they are needed again. Integration means they are connected and communicating with the nervous system. When there is a weak connection or incomplete connection it is referred to as unintegrated, active or retained. When this occurs, the reflex is constantly disrupting the communication coming into the brainstem and blocking some information from reaching the prefrontal lobes. Primitive reflexes have direct connections to the development of cognition, motor control, psychological development, learning and behavior.

Babinski: see birth to 24 months: sign of a problem in brain or spinal cord. Helps to develop gross motor coordination. Assists in commando crawling, determines the adequacy of the CNS, it could cause problems with the child's sensory, vestibular, proprioceptive and visual systems. Helps assist in development of joint rotation in feet, ankles, knees and hips. Helps develop muscle tone in lower body. Child lacks grounding and stability, has difficulties with gross and fine motor coordination, difficulty with passive decision making and communication/timidity. With its connection to the vestibular system, it helps to develop balance, coordination, speech, and higher-level cognitive skills.

Test by stroking bottom of foot from heel up lateral (outside) aspect then across the ball of the foot.

To integrate reflex which has been retained beyond 24 months, desensitize by stroking bottom of foot with blunt object 15-30x twice a day, 5-7 days for 30 days then retest. Always do bilaterally.

Palmar grasp: emerges 11 weeks in utero, inhibits 2-3 months (replaced by pincer grip at 3 months). The reflex is to prompt a baby to cling to mother if she needs to flee from danger. It governs the baby's ability to grasp and hold objects. It also plays an important role in oral motor movements such as sucking, feeding and speech. When retained, it affects handwriting, speech and fine muscle control. You may notice a child who automatically moves mouth when involved in activity using hands such as drawing. This prevents development of independent muscle control of the tongue and front of mouth, affecting articulation. It will interfere with independent thumb and finger movements and can cause an inability to put thoughts on paper. One may also see poor dexterity, poor handwriting, poor pencil grip, speech difficulties, poor articulation, hypersensitive palms, challenge using scissors or utensils as well. Gross motor skills such as crawling, swimming, and throwing/catching a ball may also present a challenge.

Test by placing a finger into the palm of the infant's hand. The baby should curl his fingers, with thumb under the index finger. They should grasp and then hold.

To integrate either stroke hand (30x/3xdaily/5-7days/30 days) or by squeezing stress-like ball for 10 times, then squeeze ball with each individual finger counting out loud forwards and backwards. Retest after 30 days.

Rooting/Sucking Reflex: present 24-28 weeks in utero, inhibits 3-4 months; to help baby with breastfeeding/eating. When the reflex is retained, there will be immature muscle development of the structure of the mouth and tongue, affecting swallowing, feeding, speech, articulation and manual dexterity. You can see poor appetite, picky eating, difficulty with chewing and swallowing, immature digestive system. They will have a tendency to dribble beyond toddler age, poor articulation, tendency to chew pencil or other objects while concentrating, needs oral gratification-may suck thumb, bite fingernails, smoke, chew foods noisily. The child may have fussy eating habits (like mild flavored, soft textured foods due to difficulty chewing and swallowing). There may be a need for orthodontic treatment, over sensitive touch on cheek and mouth, fearful of separation and security.

Test by stroking naso-labial folds.

Integrate by stroking naso labial folds 30x/3xdaily/5-7days/30 days and retest.

Symmetrical Tonic Neck Reflex (STNR): present 6-9 months and should integrate or inhibit between 9-11 months. STNR is known to be transitory and develops the TLR. It divides the body in half at the horizontal midline. Head extension causes the upper body to extend and lower half to bend. Head flexion causes arms to bend and legs to straighten. This allows the infant to defy gravity, to adopt the quadruped position and learn to how use the two halves of the body independently. It helps to develop near/far vision, binocular vision and biaural hearing. It helps with bilateral movement and processing information in both the left and right hemisphere. It will help with cross-lateral movement of crawling and acquiring intentional movement. It will help the baby get up to hands and knees and use upper and lower halves of body independently. The rocking motion used by infants just before learning to crawl helps to inhibit TLR and synchronizes functioning of sacral and occipital areas enabling the infant to pass on to next stage of crawling. Children with this retained rarely crawl on hands and knees. They tend to shuffle on their bottoms, pull themselves up to stand and walk. When retained a child may have poor posture- more stooped presentation. They will “bear-walk” on hands and feet instead of crawling on hands and knees. They may ‘bunny hop” instead of crawl. The child may present with hypotonic (weak muscle tone), vestibular related problems such as poor sense of balance and car sickness. They will prefer to sit in a “W” position or lie on the floor to watch TV or do activities like homework. They may dislike sporting activities such as physical Ed and running. They may display oculomotor dysfunction (like eye tracking and focusing near to far; visual-perceptual difficulties, spatial problems, poor sequencing skills, poor sense of time. There may be problems with vestibular system affecting balance, coordination, and orientation which may prevent child from being able to creep on hands and knees as movement of the head will result in extension of the legs. They may display motion sickness, and spatial problems may impede crawling and creeping leading to poor muscle tone later on. Leaden leg movements, tendency to tip toe, growing pains in legs, slumping in seat, poor organizational skills (head forward posture), shortening of hamstrings, carpal and Achilles. Behaviorally, a child may have poor impulse control, may have difficulty with attention and concentration when asked to sit still.

To test: Have child stand straight with feet together, arms at sides. Slowly tilt the subjects head back into extension and have them close their eyes. After 10 seconds, have them slowly move their head forwards as if looking at their toes, and maintain for 10 seconds. Do 6 times looking for sway.

To reintegrate, have child do meatball (sitting position bring knees to chest) 15 seconds. Then have patient do superman, lifting head arms and legs and hold for 15 seconds. Do 10x/3xdaily/5-7 days/30 days then recheck. *If can't hold for 15 seconds- start with 5 seconds and work way up to 15. Doctor/parent can also help by holding up legs while child holds up arms until child is able to do both on own. Another way to test is to have patient on all 4s, drop head and arch back (cat position in yoga) then have them drop back and extend head (cow position yoga). (+) would be arms collapsing. To inhibit, have patient do stretching cat (patient fall back on heels), cat/cow, ipsilateral arm/leg extension (bird dog). 5-10x/3xday/5-7 days/30days then retest. Hold all positions for 15 seconds.

Crawling may also be bypassed by children who were given little time to play on the floor in the first eight months of life. If baby crab crawls on a slippery surface that is not a positive indicator- it's more of them trying to be stable- you want to see them on carpet for the test.

Tonic Labyrinthine Reflex (TLR): It is a continuation/development from the STNR. Forward (flexion) develops 3-4 months in utero and should integrate at 3-4 months. Backward (extension) emerges at birth and can integrate slowly until around 3.5 years. It is referred to as a duet due to it having a "flexion" and/or "extension" component. They help to develop correct head alignment contributing to balance, visual tracking, auditory processing, and muscle tone. It helps to develop the muscle response of the core and limbs to respond to changes in the inner ear caused by head movements. It will help the baby develop symmetrical positioning of limbs and gross motor coordination to help move the babies to arms and knees for crawling. When retained, the child may show signs of difficulty with movement, balance and behavior. Weak muscle tone can be present with TLR forward. Motion sickness, vertigo, fear of heights, difficulty lifting arms and climbing, fatigue with trying to learn, sit or lie down can all be signs of a retained TLR forward. A retained TLR backwards can manifest as tight muscles. The child may demonstrate difficulty crossing midline when cross-crawling, walking and skipping. They may prefer to do one-sided movements rather than cross-lateral movements. A child may also have difficulty walking over uneven surfaces, exhibit toe walking or balances issues when looking up. With a retained TLR, a child or adult may be perceived as being out of touch with their feelings. Educationally, a child with a retained TLR duet may exhibit auditory processing difficulties, difficulty learning new material, following multistep directions or performing specific movements. There may be difficulties with reading, copying from the blackboard, working with math columns, speech disorders, spelling and composition, and building concepts. Symptoms of ADHD are often seen with a retained TLR duet.

Integrate: place hand flat on child's back where the middle and low back meet. Gently press down and hold for 8 seconds. Do 4 times. Then have the child bring their head and knees up toward each other and hold for 8 seconds. Then have the child's lower legs and head, hold for 8 seconds. Do sequence 4 times. Then have child bring head and knees up, as they do this, use both of your hands to hold right on top of ears on the head on both sides. Do not use pressure. Hold for 8 seconds. Lastly have the child lower their head to ground with chin pointed up, and legs to the ground knees at 45-degree angle. As a child does this, hold the top of shoulders midway between the head and arm with no pressure. Hold for 8 seconds. Do 4 times.

ATNR: Emerges in utero at around 13 weeks and is fully present at birth. It should inhibit 4-6 months. The reflex helps with the birthing process and the birthing process helps to develop the reflex. After birth the reflex helps the baby develop motor skills such as rolling over and crawling as well as early hand-eye coordination. The reflex also helps develop baby's visual field and ability to see and grasp objections. Before the reflex integrates between 6-7 months, it will help to develop the corpus collosum (which connects the left and right hemispheres). It will also help develop the vestibular system and mechanisms for balance, including the semi-circular canals. When retained, the reflex can be responsible for developmental delays which can include difficulties with movement and coordination, vision and balance, hand-eye coordination, eye tracking, binocular vision and bilateral movements. This tends to be the most common reflex retained with children with motor problems and is more common in boys than girls. A retained ATNR can cause the inability to bring the hand to midline which can cause the baby to be less able to reach for and put objects in their mouth. Later it can affect reading, writing and sports. It is considered a transitional reflex (can be present from 4-24 months) with STNR and TLR. It has influence on mixed laterality (right hand/left footed) or ambidexterity and may have a hard time picking a dominant hand when retained. Poor hand-eye coordination (using utensils), poor upper/lower limb and body coordination, poor motor skills, poor horizontal eye tracking, difficulty reading and writing, poor distant vision, problems with balance (riding a bicycle), poor at sports, struggles in school can be seen when it is retained. Over 50 percent of children with a retained ATNR have been diagnosed with dyslexia. They can exhibit difficulties with writing (also handwriting) and math sequencing.

To test stand with feet together, arms held out in front of body at shoulder height with hands relaxed at wrists. Instruct the child to maintain the position of the arms while you rotate the head to one side. Pause for 10 seconds and return to midline. Then repeat to other side, repeat 4-6 times. Positive- body will follow head or arms will move up and down. Positive sign can be in one or both directions.

To integrate- do lizard: laying on stomach, turn head to ipsilateral side and bring up arm and leg. Switch sides. Make sure the patient is on a textured surface and is dragging arm and leg on floor. Can also play music in ear- start in left ear and retest- if worse play music in right ear. Music should be classical.

Moro: emerges 9 weeks in utero and works in concert with the **Fear Paralysis Reflex.** The Moro reflex should develop as the FPR integrates and should inhibit by 2-4 months. In utero it helps to develop the breathing mechanism and ready the baby for labor. It helps with extension of head and neck, to curl forward and grasp for mother. It has a more protective role in the newborn. These two reflexes lay the foundation for all others. As it integrates the adult startle reflex will emerge. The adult startle reflex lets a person filter out irrelevant sounds and only respond to relevant ones. When the Moro reflex is retained, it can cause developmental delays. It can be seen as asymmetrical, absent or overactive. Asymmetrical or absent may show damage to spinal cord or brain, or paralysis of one side of the body. Overactive can be displayed as a child who startles easily, has trouble staying asleep. These babies are woken by the slightest noises. They may cry frequently, be fussy and clingy and difficult to comfort. A child my not like affection while another may feel insecure and only want to be held. As the child gets older, a retained reflex will cause immature eye movements which can affect copying from a blackboard, catching a ball, and the inability to focus. They may also have a sensitivity to bright lights, difficulty reading black print on white paper, and fatigue under fluorescent lights. Vestibular changes can be seen as well- motion sickness as well as poor coordination (particularly during ball games),

balance problems. They may also exhibit a dislike of loud noises, be easily distracted, have allergies and a lower immunity. They may also crave sweets and prefer to snack eating full meals. They may also suffer from headaches. Emotionally, a child may suffer from anxiety, panic attacks, emotional outbursts and mood swings. They may also act out by pinching and biting and overreact. They may dislike change (may be clingy and shy). In adults test if had severe trauma. May see an exercise mad, workaholic adult who cannot relax even on a holiday, may be producing too much. Hypersensitivity-severe physical discomfort in response to light touch, hair/nail cutting, having face washed, wearing certain fabrics. "Type A personality". While the reflex is reintegrating, a person (child or adult) may notice emotional/behavioral changes that could look like tantrums as seen in the "terrible twos".

Test by having patient stand with feet together, arms out front in line with shoulders and relaxed hands at wrist. Tilt head back and have patient fall. As the doctor stands behind the patient to catch them. This will be like a trust fall. (+) is if they cannot fall back. OR test supine 2 ways: first hold patient's head in hands and as the doctor drops the head, as patient to cross arms at chest. OR place hands under patient's neck and lift head. Then put pressure under the patient's knees and lift. Positive sign if patient lifts head to help doctor and/or knees stay straight and don't bend.

To integrate have patient sit at edge of table and do starfish motion: spread arms and legs wide then do cross crawl movement- cross same arm and leg over midline and crunch forward. Then do other side. Do 10x each side/3x daily/5-7days/30 days and retest.

Fear Paralysis: see 5-7 weeks in utero and integrates between 9-32 weeks. Replaced by Moro when retained you will see low tolerance of stress, constant state of anxiety, tends to freeze where there is a threat instead of fight or flee. Sensory processing issues, hypersensitivity to light and sound, does not adapt to change, overly clingy, extreme fatigue, deer in the headlight's response, selective mutism (not speaking in situations where speaking is expected, especially if speaking is already an established ability), holds breath when angry or upset, OCD traits, defiant, controlling behavior, glued to technology, poor body posture, no facial affect.

To test have patient lay supine and close eyes. Tap over hand over thymus, tap outside elbows at same time, tap outside knees at same time, tap bottom of feet at same time. Eyes will twitch if positive. Tap to the rhythm of 1-2 cha cha cha.

To integrate: tap again to rhythm of 1-2 cha cha cha- middle of sternum on top of your hand or theirs, end of the deltoid muscles, ends of triceps muscle with arms up, upper end of TFL, middle of the arch both feet. 3x/1xdaily/1-2xweek. This is a powerful reflex and may see emotional responses when doing exercises.

Spinal Galant: emerges 20 weeks in utero and helps to develop the auditory processing systems of the brain and later in pregnancy will help with the birth process. It should integrate by 6-9 months as child starts crawling on hands and knees. It will also contribute to the development of the inner ear, which will help with balance. It will also help in the development of lower back muscles, buttocks, pelvic area and back of legs. If retained past 1 year, a child may have difficulty controlling their legs while running and walking. They may have an unbalanced gait that could lead to tripping or have a lopsided rolling gait where their legs flare out. If only retained on one side, it could lead to scoliosis and potential spinal injury at L5/S1 and complaints of low back pain. Their overall movement pattern may be homolateral when walking, marching, or skipping instead of a cross pattern movement. They may be fidgety and be

very sensitive to tactile stimulus (tags, certain clothing fabrics). They will prefer to do homework while laying on the floor and will have difficulty "sitting still" and not like seat with lumbar supports. In school, you may see a child who has trouble focusing, concentration and overall performance. They may have difficulties with short term memory, have mental fatigue and delayed cognition which can also make it difficult to process information. They will also have difficulty with handwriting and are often diagnosed with ADHD. If retained, you can see enuresis (both daytime and nighttime). They will exhibit shallow breathing and constrained vocal tone. In adults you may see IBS, sexual dysfunction.

To test: patient is on all fours. Do a light stroke to either left or right side of lower back causes hip to rotate towards same side. Where SG is still active, the upper torso tends to jerk to the same side at the same time as the hip. To inhibit: have patient do snow angels. You can also stroke the back until desensitized. Do 10xday/3xday/5-7days/30days then retest.

Spinal Perez: This reflex develops at birth and should integrate in the first 2-3 months of life. It is important for the development of movement and mental processing. It helps with gross motor coordination such as walking and running when they get older, clapping of hands and crawling swim stroke. If it is absent, it could indicate cervical spinal injury, cerebral damage or myopathy. When retained, a child may have poor muscle tone, strength and coordination. They may also have back pain and be inclined to future back injuries. We can see with poor head leveling, abnormal gate, inhibition of rolling over, sitting up, crawling, standing, lack of proper visual and auditory perception/tunnel vision. Emotionally they may exhibit phobias and feel and lack impulse control. They may have speech disorders and trouble expressing information. A retained reflex can delay information from the brain stem to the midbrain to frontal lobes. This can affect sensory and auditory processing, mental processing speed and memory, logical thinking and creativity. Children with this retained reflex are often diagnosed with ADHD, enuresis and discomfort with tight fitting clothes. These kids will never have crawled or rolled. It is often associated with the **Spinal Gallant Reflex.**

Test by lightly stroking at L5 upwards on either side of spine. The response is flexion of the trunk and limbs, lifting of the head and pelvis, sometimes a loud cry or urination. To inhibit: lay face down with arms by shoulders. Have the patient lift butt into air and lift head at same time. Hold for 15 seconds. If can't hold for 15 seconds, start with 5 seconds and work way up. Do 10xday/3xday/5-7 days-30 days then retest.

**only have patient work on 1-2 reflexes at a time until inhibited.

(all information from Symphony of Reflexes by Bonnie Brandes, and Dr. Linda Slak)