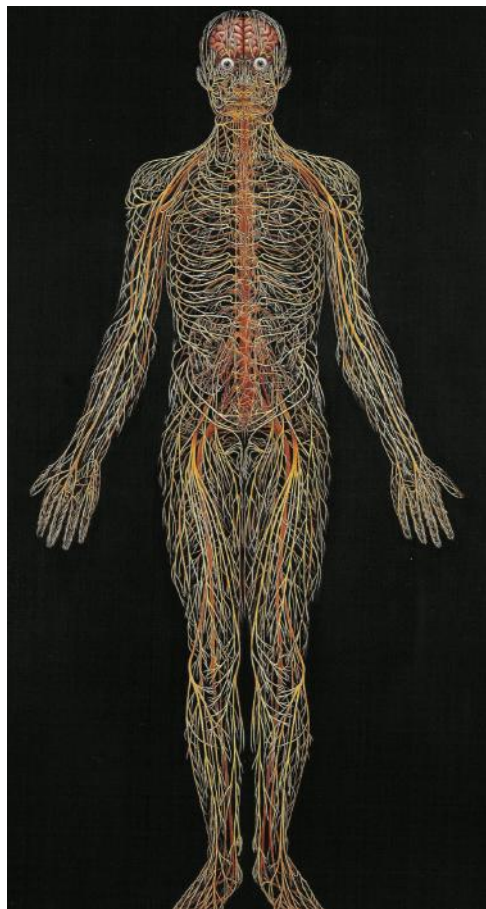


# *Zooming in on Reflexes*



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### **Remark:**

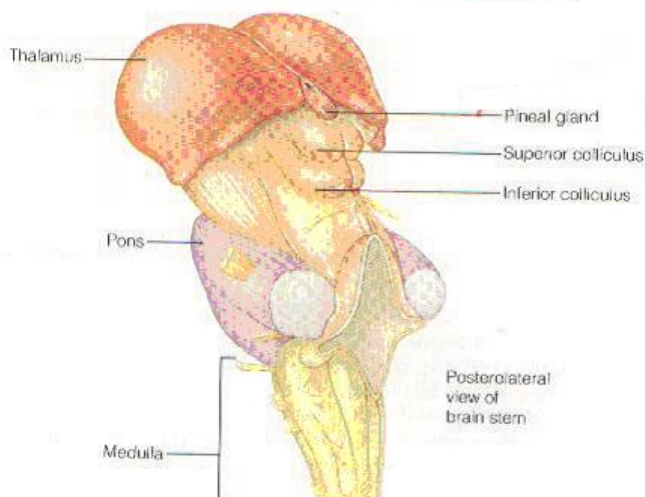
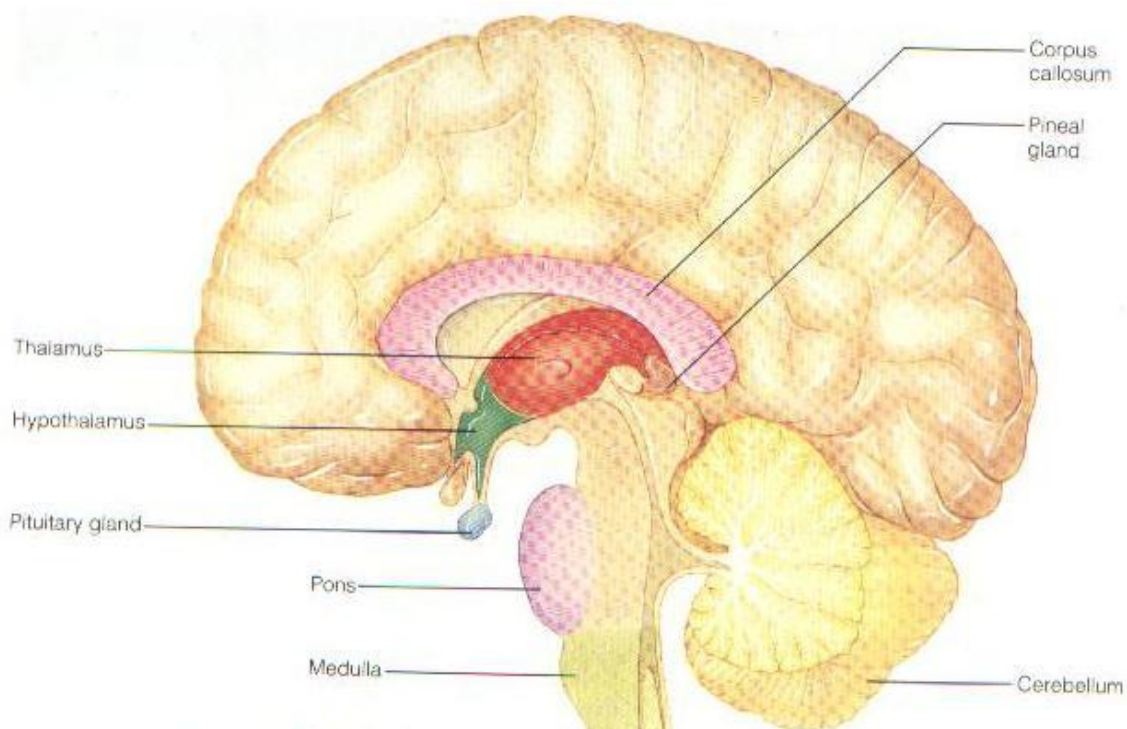
Please note that all examples do not need to be unique for one type of reflex, which did not inhibit. The examples are provided to give us more insight in a potential problem. It is recommended that in case you believe you recognize symptoms as described, to consult a professional who is familiar with the Primary Reflex knowledge.

## Zooming in on Primary Reflexes

In this document we explain some of the very basic and primitive reflexes we develop – before and after birth – simultaneously with the development of the nervous system. It also explains how these reflexes should "inhibit" or fall away during some weeks, months and years. We also address what we might notice when someone did not inhibit these primary reflexes. Each retained reflex controls aspects of posture, movement, perception and behavior, all of which affect our ability to function in the world.

Please understand that this document is written to give you some background information about primary reflexes and the symptoms when these were not inhibited. We will not focus on reflexes that are retained during the complete life span of a person, the so-called postural and head righting reflexes.

Note that all kids and people are different, so all symptoms mentioned at a certain age may vary a little. We do not intend to provide you with the techniques how to analyze or how to treat the specific reflexes or behaviors. Please consult a professional who is familiar with this knowledge, in case you have additional questions.



Higher, more sophisticated regions of the brain begin to supersede the primitive (= primary) reflexes. As this occurs early survival patterns are inhibited or controlled to allow more mature patterns of response (postural reflexes) to develop in their place. The postural reflexes are regulated by higher centers in the brain involved in the execution of voluntary movement.

## What Are Infant Reflexes?

Many people who have cared for an infant are familiar with childhood reflexes: Put your finger in the infant's hand and her fingers grip, with thumb not involved (Palmer Reflex). The infant's head turns to one side and both arms turn to that side (Asymmetric Tonic Neck Reflex). Stroke the infant's low back on one side and her side muscles instantly contract (Spinal Galant Reflex). Surprised by a sound, the infant instantly spreads his hands wide, head back, eyes wide open, breathing in (Moro Reflex). Doctors often gauge the development of the child by the orderly progression of these reflexes.



Primary reflexes are movement patterns, which emerge during fetal life and are critical for the survival of the newborn - e.g. infant rooting and suck reflexes. They are obvious during the first six months of life and some primary reflex tests are routinely used by pediatricians, to assess the neurological integrity of the newborn baby. As the nervous system develops, however, they are inhibited or transformed and the persistence of primary reflexes beyond their normal time-span (6-12 months) interferes with subsequent development and indicates neurological impairment.

Under optimal circumstances all primary reflexes "initiate" during the appropriate stage of the child's development, "integrate" themselves as a firmly functioning reflex, and then "inhibit" or fall away when it's time to move on to the next developmental stage. It is vital that this occurs.

Higher, more sophisticated regions of the brain begin to supercede the primitive (= primary) reflexes. As this occurs early survival patterns are inhibited or controlled to allow more mature patterns of response (postural reflexes) to develop in their place.

The postural reflexes are regulated by higher centers in the brain involved in the execution of voluntary movement.

It is only as postural reflexes replace primitive reflexes that the infant begins to gain control of the body and body movements. A child who has cerebral palsy never makes the transition from primitive to postural reflexes, and so movements remain random and uncontrolled. To this extent at birth we are all born mildly cerebral palsied, but in the early months of life we rapidly gain control of the primary reflexes, and thus lay the foundations for later voluntary movement

If various reflexes fail to initiate, integrate and inhibit, the system is locked into a developmental holding pattern that prevents natural maturation of neural systems, inevitably leading from mild to severe learning and performance challenges.

Some children fail to gain this control fully in the first six months of life and continue to grow up in a reflexive "no man's land", where some of the primitive reflexes remain present and the postural reflexes do not develop fully. These children are not cerebral palsied, but they do have enormous difficulty with voluntary movement patterns as the body remains under the influence of involuntary response. Retained

primitive reflexes will also affect a child's sensory perceptions, causing it to be hypersensitive in some areas and hypo sensitive in others.

## Order of reflexes

In this document the primitive reflexes are described in the order of treatment. All reflexes must be fully developed, integrated, and then inhibited. If one reflex is still "on", it is quite certain that other reflexes are "on" as well.

## What is developmental immaturity?

As mentioned the nervous system develops through several stages. If these stages are never fully finished, the child, and later the adult, will be struggling to cope with an immature system. The stages of development can be identified as specific stages of reflex development. If early reflexes are present and adult reflexes are not fully developed then the child has a developmental immaturity.

For children, these challenges show up clearly in the classroom, where it is hard for them to keep up with grade level expectations for academics and behavior. Children most able to cope develop techniques for compensation, and succeed or just get by with great effort. Those least able to cope often end up in special-ed classrooms or alternative schools. They are at high risk for behavior and attitude problems, most often out of years of sheer frustration. At home you may notice some of the behaviors we list on the following pages. Again, please consult a professional on these topics when you believe you identify some of the symptoms with yourself or with someone else.

The symptoms of these problems are frequently experienced or labeled as:

### Physical

- Dyspraxia
- Dyslexia / Learning Difficulties
- Poor Memory
- Poor concentration -often called ADD
- Hyperactivity - often called ADHD
- Speech problems (Oral Dyspraxia)
- Asthma or breathing problems
- Allergies
- Eczema
- Digestive trouble, stomach / intestine problems, movement problems
- Insufficient assimilation
- Opposite reaction on medicines
- Immunity issues
- Fatigue

## Personal

- Emotional & Behavioral problems
- Anxiety attacks
- Light Sensitivity
- Learning difficulties, Academic underachievement
- Poor social skills
- Clumsiness
- Make a mess, Spill
- Poor muscular movement
- Travel sickness
- Sensitive for screens & monitors (cathode ray tube's)
- Child does not crawl
- Bedwetting after age 5
- Difficulty learning to tie shoe laces/use knife and fork
- Problems or delay in speech development
- Poor concentration usually with fidgeting or daydreaming

Some of the complaints a little more explained:

**Dyslexia** - an inability to read. Generally used in cases where there is normal intelligence, but where the usual methods of teaching have failed.

Some institutes say; "true dyslexia" where three of the four following characteristics are present:

1. Continued word or letter reversal beyond the age of 8 years;
2. Difficulty with rote learning;
3. Free writing deteriorates so badly that even they cannot understand what they have written;
4. Auditory delay/confusion.

**Dyspraxia** - often called "Motor Learning Difficulties or Clumsy Child Syndrome" - a disorder of movement involving impairment of the ability to carry out skilled activity in the absence of paralysis or other impairment of primary motor pathways controlling movement. In other words, the body will not easily carry out what the brain wants it to do!

**Attention Deficit Disorder (ADD)** - poor attention span and weak impulse control.

**Attention Deficit Hyperactive Disorder (ADHD)** - poor attention span, weak impulse control and hyperactivity.

**Scotopic Sensitivity** - individuals exhibit an unusual sensitivity to specific frequencies and wavelengths of the white light spectrum. Black print on a white background, for example, may lead to cells in the retina becoming over stimulated and sending incorrect signals to the brain.

**Dysgraphia** - a reading disorder involving delay or inability in learning to recognize and interpret visual symbols.

**Dyscalculia** - a delay or inability in learning arithmetic facts and operations, and their meaning.

## **Warning signs of developmental immaturity?**

The following list, though not exhaustive, does include many of the most common indicators of developmental delay:

- - Health/stress problems during pregnancy
  - Birth more than 2 weeks early or late
  - Difficult labour or forceps delivery
  
  - Low birth weight
  - Problems with feeding
  - Delay in learning to walk, talk, etc.
  
  - Frequent ear, nose or throat problems
  - Clumsiness, dislike of games and sport
  - Poor posture or co-ordination
  
  - Behavior problems - mood swings - impulsive reactions
  - Anxiety attacks
  - Lack of confidence, low self-esteem
  - Difficulty in spatial orientation, or telling left from right
  - Difficulty in learning to read and write

## What Disrupts the Reflex Continuum?

Many things can disrupt the normal progression of infant reflex development. Some of the medical systems call the symptoms Neuro Developmental Delay. At-risk pregnancy, Caesarean section, fetal distress, birth trauma, infant illness, and extreme stress or illness in mother are but a few of the suspected causes.

### Pregnancy

- Hyper emesis (severe sickness)
- Severe stress
- Threatened miscarriage
- Severe viral infection during the first 12 weeks, or between weeks 26 to 30
- Hypertension (high blood pressure)
- Uncontrolled diabetes
- Excessive alcohol consumption and/or drug abuse
- Placental insufficiency (small for dates)
- Radiation
- Smoking
- Accident or infection
- Toxoplasmosis

### Birth

- Prolonged or precipitive labour
- Cord around the neck
- Placenta previa
- Fetal distress
- High forceps or ventouse extraction
- Premature (more than 2 weeks early) or post mature (more than 2 weeks late)
- Breech
- Caesarian

### Newborn disorders

- Low birth weight (under 5 lbs)
- Requiring resuscitation
- Incubation
- Blue baby
- Distorted skull
- Heavy bruising
- Prolonged jaundice
- Problems with feeding during the first 6 months

### Infancy

- Illnesses involving a high fever, delirium or convulsions in the first 18 months
- Vaccinations
- See previous list

## Compensation Takes Great Effort

Throughout our lives we strive to compensate for any of these reflexes that may still be "on," and these compensations take a tremendous amount of energy. Under stress we simply run out of energy for this compensation and we are less able to cope. As one enters the elder years of life, the energy to continue these automatic compensations becomes less and less available and the reflexes themselves begin to reappear, in reverse order; in this way, abilities fade and frustration emerges because of the tremendous effort required to do familiar tasks.

The good news is that there are simple ways of determining where any child or adult is in relation to any or all of these reflexes, allowing them to completely resolve, one at a time. Results are often immediate and can be quite dramatic.

On the following pages we zoom in on the more specific reflexes. Much of this information can be found on the web-pointers and books mentioned in chapter "References".

As mentioned before we are all different, some kids are very fast in their learning curve, other are taking more time to inhibit their reflexes. In case you have questions or have a concern about your child, please consult a professional who is familiar with this knowledge.



## Withdrawal Reflex

The withdrawal reflex is in some of the theories the first reflex. At the age of 5 weeks of the unborn child the baby starts to react on external stimuli. It starts to follow the external stimuli, like seaweed follows (bows with) the flow of the sea. So you can say that the function of this very first reflex is getting sensitive for external stimuli. This reflex should be inhibited at the time of birth.

If this reflex does not fall away you will see that the person prefers to avoid contact and confrontation. They feel being excluded, causing day dreaming, non-attendance, always being too late, and no contact with other people or environment, "not connected with mother earth". Having the feeling of not being centered in their body. A Jack-of-all-trades and master of none, not being heard or seen, being the drop out. Hesitate for ages, faint hyperventilate, have absent-mindedness, they cannot defend themselves and are boundless.

You can recognize this attitude at people who always say yes or do the opposite they redraw themselves and sit in an ivory tower, "being too busy". In case these persons also suffer from an uninhibited Moro reflex they can come down handsomely (fanatic).

## FPR - Fear Paralysis Reflex

The Fear Paralysis Reflex is a major key to all other possible primary reflexes. It is one of the first reflex to manifest. Indeed, the Fear Paralysis reflex is intended to develop, become integrated, and "inhibit," or fall away, all in utero, long before birth.

If the Fear Paralysis Reflex (FPR) does not follow the intended route of development, the child's (or adult's) system is left locked in a fear state that permeates all waking and sleep activity. If Fear Paralysis is still active all situations are (neurologically) seen through a filter of fear.

**A partial list of behaviors** that may manifest due to lack of resolution of Fear Paralysis Reflex is as follows:

- Fear of social embarrassment
- Insecure. Lack of trust in oneself. May become socially isolated and withdrawn.
- Overly clingy or may be unable to accept or demonstrate affection easily
- Negativism, defeatist attitude
- Won't try new activities, especially where comparison occurs or excellence is expected or the opposite behavior.
- Depression
- Craves attention
- Fear of school
- Compulsive traits
- Temper tantrums

- Controlling or oppositional behavior, especially at home
- Dislike of change or surprise/poor adaptability
- Immediate motor paralysis under stress - can't think and move at the same time
- Reduced muscle tone
- Eating disorders
- Aggressive behavior borne out of frustration and confusion
- Poor balance
- Low tolerance to stress
- Anxiety seemingly unrelated to reality
- Hypersensitivity to touch, sound, specific frequencies of sound, changes in visual field.
- Dislike of change or surprise/poor adaptability
- Fatigue
- Elective mutism - the persistent failure to speak in specific situations where speaking is expected, despite the ability to speak otherwise
- Holding breath

## When FPR is still on

Children or adults with FPR still "on" in their system will typically manifest a cluster of these behaviors the more fully the reflex manifests, the more pronounced the behaviors will be, and the more severe the implications in their life.

Like all reflex issues, Fear Paralysis Reflex responds quickly and easily to the balance process. Once identified and addressed, rapid, permanent change is experienced.

Resolving Fear Paralysis is a powerful step in creating true inner ease. It may be the step your body has been waiting for your entire lifetime.

Some FPR examples can be found at page 28.

### What does it take to resolve a reflex?

As we mentioned earlier, each primitive reflex must be fully developed, integrated, and then inhibited. If Fear Paralysis Reflex is still strongly "on," it is certain that other reflexes are, as well. And each reflex creates its own unique strain on the system, producing its own array of learning and performance challenges.

As you approach resolving each of these reflexes, it's important to move slowly. Sessions held too close together could be counter-productive, as time needs to be allowed for the neurology to mature.

## Moro reflex

The Moro reflex is also known as: Embrace reflex, Startle reflex, Startle response. FPR and More are often mentioned in one summary knowing Moro Reflex.



The Moro reflex acts as a baby's primitive fight/flight reaction. It should be inhibited by circa 4 months of post-natal life to be replaced by an adult "startle" reflex.

The Moro reflex may be demonstrated by placing the infant face up on a soft, padded surface. The head is gently lifted with enough traction to just begin to remove the body weight from the pad (Note: the infant's body should not be lifted off the pad, only the weight removed).

The head is then released suddenly, allowed to fall backward momentarily, but quickly supported again (not allowed to bang on the padding). The infant may have a "startled" look, and the arms fling out sideways with the palms up and the thumbs flexed. As the reflex ends the infant draws the arms back to the body, elbows flexed and then relaxes.

This is a normal reflex present in newborn infants. Absence of the Moro reflex in an infant is abnormal. Presence of a Moro reflex in an older infant, child, or adult is also abnormal.

## What happens in the body

As we have discussed on page nine, the body needs to work hard, because of the existence of not inhibited Primary Reflexes. But what is happening in the body during these survival reactions?

The adrenal gland<sup>1</sup> is responsible for the production of adrenalin and cortisol (stress hormones). The body needs these to protect itself against infections. We also need adrenalin in "escape- and fight" actions. The substance will cause action:

- The heart will pump faster, by which
- The blood-vessels need to give a flexible passage to the accelerated circulation of the blood to
- Deliver immediately more fuel (oxygen) to the main muscles.

The side effects can be:

Sweating, getting red, heart palpitation<sup>2</sup>, accelerated breathing or stop breathing when panic. This all has a great impact on the metabolism<sup>3</sup> in the body, like the increase of the blood sugar, etc. There are many waste materials produced, which cause an extra burden for the organs.

---

<sup>1</sup> bijnier

<sup>2</sup> hartkloppingen

<sup>3</sup> stofwisseling

Consequences of Moro for the body, emotions and thinking are;

- The adrenal glands get exhausted.
- The waste materials, like non-processed adrenalin, which are not eliminated completely will be stored and function as poison.
- Liver and kidneys have to work very hard to clean the body. The liver can get irregularities, through which allergies can develop.
- The digestion is regular interrupted or even stopped, during the fast activation of the muscles.
- The intestine and stomach work less, so food is not digested well. The result of this is that waste products (slag) remain in the intestine and poison (pollute) the body.
- The lungs have to work harder to excrete the slag (toxic), which cannot be processed by the intestine.
- This is disturbing the breathing and together with the increased waste production in the body may cause tightness of the chest, asthma, cramp (tense up) in the trachea.
- By this infirm (problematic) carry off, the waste products do accumulate. This may give utterance to eczema, itching, polluted blood and pain.
- The cells start to suffer from a shortage of food, storage of poison and the cell wall contracts during intense stress.
- In general people at this stage are more sensitive for infections.

The above may lead over the longer term to:

- Exhaustion of the immune system.
- Uncertainty about his own reactions, low self esteem, fear of failure.

The body consumes very much energy during the situation described above. The body will withdraw from other actions (survival is priority one).

## **If Moro reflex does not fall away**

If the Moro reflex does not fall away when it should, one remains poised on the edge of "fight or flight" throughout the rest of one's life. This can result in being very emotional, easily distracted, physically timid, having low tolerance to change or stress, being either insecure or controlling (both a reaction to sense of fear), having auditory confusion, poor stamina, difficulty in reading, and much more. When we are in fight or flight, as those with Moro invariably are, the body's eye muscles pull both eyes outward to the periphery of one's vision, making it very challenging to focus on something in the center of one's vision. People with Moro still "on" are much more likely to focus first on the blank border of a page of print, for example, rather than on the print itself. (Needless to say, this makes reading very difficult, and tiring on the body.) ! "Moro persons" might have the hardest time remembering people, because they don't really see their faces, they see just the outlines of their heads. Of course

they panic at an object coming right to the center of their field of vision, where their eyes had the hardest time seeing.

The reflex is triggered by over-sensitivity to sound, light, temperature changes, movement or a combination of these stimuli.

Adults with this reflex have the same symptoms as children and adapt their environment to their needs. Some adults will crave outlets for their over-stimulated bodies and will be continually active. Others will tend to withdraw from stimulus as much as possible in order to control their internal restlessness.

## The Palmer Grasp Reflex

This 2 weeks old infant is demonstrating the Palmer grasp reflex. A touch to the palm of the hand results in the infant closing her fingers, but not her thumb, around the object in the palm. Newborn infants can lift 1.1kg. in each hand with this reflex. The Palmer grasp reflex is present from birth to approximately 4 months. The Palmer



grasp reflex is classified as a primitive reflex. Primitive reflexes include the sucking, rooting, asymmetric tonic neck and plantar grasp reflexes, and are important in the infant's survival. The grasp reflex will migrate to another level at the age of 7 months. Then the baby will start to grasp purposefully.

When Palmer is still on, people can have difficulty holding their pencil or act like they are left handed (clumsy).

## Asymmetrical Tonic Neck Reflex (ATNR)



In normal development the primary reflex system is inhibited or transformed in the first year of life and a secondary or postural reflex system emerges. The secondary system forms the basis for later adult coordinated movement. However, primary reflexes may persist for certain children beyond their normal time-span and disrupt subsequent development.

The ATNR is most obvious in the first three months after birth. The ATNR is activated as a result of turning the head to one side. As the head is turned to one side, the arm and leg on that same side will extend while the opposite limbs will bend. The reflex should be inhibited by 6 months of age in the waking state. Persistence is a clinical indicator of abnormal development.

The ATNR is involved in the orientation of the newborn in space and, as it is present when near point fixation is developing, plays an important role in visuo-motor development.

Severe persistence of primary reflexes indicates predominantly intractable, 'organic' problems as in cerebral palsy where children experience extreme motor difficulties and significant reading difficulties despite adequate levels of intelligence. Relatively milder persistence, however, is associated with less severe disorders (including specific reading difficulties).

Neonatal movement is largely stereotypical and follows the patterns of the primary reflex system. The early movements of the fetus and newborn which were previously viewed as passive byproducts of rapid neural wiring are now viewed as 'interactive', having a reciprocal effect on underlying CNS structure and functioning.

This suggests that the actual rehearsal and repetition of primary reflex movements play a role in the inhibition process itself.

### If ATNR reflex does not fall away

If the ATNR remains active in a child at a later age, it can affect:

- Hand-eye co-ordination - difficulties such as ability to control the arm and hand when writing (or ball catching).
- Ability to cross the vertical midline. For example, a right-handed child may find it difficult to write on the left side of the page
- Discrepancy between oral and written performance. What the child writes will generally be of a lesser standard than that which he can produce orally
- Development of lateral eye movements such as visual tracking (necessary for reading and writing)
- Control of automatic balance
- Bilateral integration (differentiated and integrated use of the two sides of the body)

- Continued cross laterality or ambiguity of laterality above 8 years of age
- Visual tracking will be more difficult i.e. the ability of the eyes to move over and back smoothly along a line of print when reading and writing. The child may have to use his finger when reading, or continually lose his place on the page.

### Example

- Jenny always had to look straight down the road when driving. Not even a slight glance left or right, or she'd turn the car in the direction she was looking. It appeared the ATNR response kept her eye and hand movements closely tied. Following a balance to resolve this reflex, she was fine. Retained ATNR can cause considerable problems with academics; it affects the ability of the eyes or hand to move back and forth across the vertical centerline of the body, vital for writing, and eyes moving across a line of print.



## Spinal Galant Reflex

This reflex emerges around 20 weeks in utero and should be inhibited or suppressed between 3 - 9 months after birth. It has been suggested that this reflex also facilitates the birth process. As the baby is working down the birth canal, and as the vaginal wall touches part of the back, on the side that is stimulated you will get hip rotation. It may also play a large part in helping the hip ball and socket to grind in. At birth the ball and socket are not properly formed.

It may play a large part in sound or vibration conduction in utero. It is believed that the Galant is very primitive; like the reflex of a fish that is out of the water with its back going from side to side. However, we don't know sufficient about this reflex.

A child with this reflex still on who is told to sit still, may then start to make a noise. They have to be doing something - the internal excitement is too great.

The Galant is involved in movement and in micturation (urination). If it remains present, either unilaterally or bilaterally, it may cause fidgeting, make sitting up difficult (even with a nappy touching the back), lead to problems when walking and bed wetting, in addition to affecting posture. There may also be a psychological effect. If present strongly on one side only, posture may be affected resulting in curvature of the spine.

## If Spinal Galant Reflex persists it can affect:

- Ability to sit still
- Inattention
- Poor posture - can contribute to the development of scoliosis (curvature) of the spine
- Sometimes associated with poor bladder control and bedwetting



### Example:

- Charlie still has the Spinal Galant reflex strongly "on." A light stroke on one side of his lower back causes him to instantly and involuntarily contract to that side. He instinctively takes odd seated postures so that area of his back doesn't rest against the chair back. If told to "sit up and sit back in your chair!" his back makes contact with the chair and he can't help but wriggle, diminishing his chances of actually paying attention. People with Spinal Galant strongly "on" may be bed-wetters. Stimulating both sides at the same time can cause someone with strong Spinal Galant to wet himself; the Spinal Galant reflex seems to be triggered through contact with bedding during sleep. Tickling may have the same effect. Adults with irritable bowel syndrome have a very high incidence of Spinal Galant still "on."

## The Rooting and Suck Reflexes

These emerge around 24 - 28 weeks in utero and are inhibited or suppressed between 3 -4 months after birth.

In the newborn, gentle stimulation down the facial fold in the area of the cheek will result in the baby's mouth moving and its head turning towards the stimulation.



The rooting reflex and suck reflex work together, and are vital for locating and then being able to take the mother's breast.

Because the newborn baby has no voluntary control at this point, infant sucking reflex is built into the brain stem. So if anything touches the nasal fold, automatically the lips come out.

Premature babies, and some full term babies have not developed the suck reflex. Something may have happened in utero to prevent its emergence.

By around 4 months, the baby should have developed sufficient control in the oral region to be able to control the lips and go into voluntary as opposed to reflexive suck.

Many children who have verbal dyspraxia, articulation problems or who are dribblers, still have a retained rooting reflex on one side or a sucking reflex. Kids could potentially act clumsy. Mouth and lips can be over-sensitive.

The rooting and suck reflexes do not contribute to learning difficulties, but if retained, they do indicate an immaturity in the central nervous system.

### Example:

- Frances has elements of the Rooting and Suck Reflexes still "on." She has a hard time articulating words, and chews and bites objects (like her pencil) while concentrating. She has labored, noisy chewing and is over-sensitive to touch on her cheek or mouth. People with Rooting and Suck Reflexes still "on" may be fearful regarding separation from known security. When instructions are being given both verbally and visually, this person will need to shut down one mode or the other to understand the instructions, giving rise to others saying, "Look at me when I talk to you!" which often results in no information being received at all.

## Tonic Labyrinthine Reflex (TLR)



Other primary reflexes are less well known - e.g. the Tonic Labyrinthine Reflex (TLR) and the Symmetrical Tonic Neck Reflex (STNR), we will discuss in the next chapter. The TLR has two-phases, the first in flexion. There is evidence that this reflex emerges before the 12th week after conception. It should be fully inhibited by the time a baby is 4 months old. The second phase is present at birth and is inhibited slowly, usually by the time a baby is 3 years old, depending on the development of other reflexes. The flexion phase is evident as the baby's head is moved forward towards its chest; the baby will curl up into the foetal position (the baby retracts or pushes back its head, flexes or folds in its arms and extends or straightens its legs). If the baby is in a posterior presentation (face up) before birth the head will push into the mother's spine causing great pain. This reflex can be felt in the newborn by simply pushing on the back of the head. The baby will immediately resist and push backwards. At around 3 months the TLR enables the baby to lie on its front and lift up its head. It must be inhibited or switched off, however, before the baby can come up into a crawling position at around 8-9 months. If the TLR is still present at this stage the baby is not able to support its weight by straightening its arms and bringing its knees beneath its body.



In normal development the primary reflex system is inhibited or transformed in the first year of life and a secondary or postural reflex system emerges. The secondary system forms the basis for later adult coordinated movement. However, primary reflexes may persist for certain children beyond their normal time-span and disrupt subsequent development.

## If TLR persists beyond this time,

It is sometimes associated with:

- Postural problems, specifically hyper- or hypo-tonus (muscle tone)
- Tendency to walk on the toes
- Poor balance
- History of motion sickness
- Orientation and spatial difficulties
- Oculo-motor problems
- Visual-perceptual problems
- Dislike of Physical Education (PE)

### Example:

- Sheldon still has the Tonic Labyrinthine Reflex (TLR) strongly "on." When his knees bend his head must come forward, and vice versa. This results in a multitude of odd physical postures and propping up of his head when seated, and cries from the teacher or parent to "Sit UP!!" Of course, when he does, the effort required to overcome this reflex saps his energy, leaving little for listening and learning. People with STNR may dog-paddle happily in the pool with their head up but when asked to put their head down to actually swim, the knees automatically come toward the chest and they founder.

## **Symmetrical Tonic Neck Reflex (STNR)**

The STNR is present in normal development from circa 8 to 11 months of post-natal life and is a precursor to crawling on the hands and knees.

Flexing of the head is accompanied by reflex flexing of arms and extension of legs. Extending the head is accompanied by extending arms and flexing hips. This interferes with movement.

Symmetric tonic neck reflex is another posture in which the symmetrically positioned upper body moves separately and alternately against the symmetrically positioned lower body. This is a phenomenon where the upper extremities extend simultaneously with passive extension of the neck, but the lower extremities flex, whereas with flexion of the neck, the upper extremities flex simultaneously but the lower extremities extend.

This is another primitive motor activity with less separated movement. In this mode of locomotion the body propels itself with symmetrical extension of the upper trunk and upper extremities, while the lower trunk and extremities symmetrically flex. Then, the lower trunk and extremities symmetrically extend, while the upper extremities symmetrically flex, driving the body forwards. In this locomotion the driving phases in upper or lower extremities can be seen alternately in all the phases of locomotion. Phylogenetically, the original form of symmetric tonic neck reflex is mostly seen in more propulsive movements such as swimming of the frog, leap of the frog, and symmetrical quadrupedal locomotion of the Kangaroo. To put it a little less technical: the transition up into a crawling position is assisted by the emergence of the STNR, which enables extension of the arms and flexion of the legs at the same time. However, the STNR has to be 'switched off' before the baby can crawl forward as this involves a combination of flexion and extension - e.g. in a cross-pattern crawl the right arm and left leg flex while the left arm and right leg extend.

In humans' body, we can see this form in breaststroke swimming and a vaulting horse activity. These are symmetrical locomotion patterns in which a phase of upper body flexion and lower body extension and a phase of upper body extension and lower body flexion emerge alternatively, and propel the body forwards. In cerebral palsied patients, we can see the symmetric tonic neck reflex pattern in various levels, such as no rolling level, mermaid crawl level, four-point crawl level standing level and in the form of symmetric deformities such as symmetric diplegia.

STNR can be observed in the most primitive level. In that level, the elbows are symmetrically flexed, whereas the lower extremities are totally extended. Although the posture is not typical, a symmetrical pattern is somewhat predominant. You can see a STNR in a symmetric mermaid crawl on abdomen in which a pattern of upper-body-flexion and lower-body-extension and a pattern of upper-body-extension and lower-body-flexion emerge alternatively to drive the body forwards. In another form of STNR, the upper trunk and upper extremities are extended with neck extension, while the lower extremity is flexed. When neck and upper extremities are flexed, the lower extremities are extended. This movement can be named as symmetric tonic neck reflex posture. With spasticity control surgery, hyper tonicity is controlled and mid position exercises can be given to achieve a four-point crawl

position. You can also see STNR in a form of symmetric four-point crawl; this is a matured locomotion. Symmetrical spastic diplegia is also an expression of STNR in a more matured level.

Crawling is a major development milestone. It represents the transition from fetal/infant movement, which is dominated by primary reflexes, to movement, which allows the young child to explore its surroundings independently. At around 12 months, the baby, who began life in the fluid environment of the womb, may be ready to take the first tentative steps on "dry land".

## If STNR remains present in an older child, it can affect:

- Integration of upper and lower portions of the body (for example, when swimming)
- Sitting posture (tendency to slump when sitting at a desk or a table)
- Poorly developed muscle tone
- Poor hand-eye coordination - Attention \*(O'Dell and Cook 1996)



### Example:

- Mara still has the Symmetrical Tonic Neck Reflex (STNR) strongly "on." She has a strong tendency to slump when sitting, particularly at a desk or table, and frequently twists her legs around the legs of her chair. Cross-legged sitting is uncomfortable; she prefers "W" sitting, with both legs folded back to the outside of her body. She has great difficulty with any activity that involves rapid adjustment of near to far vision, such as copying onto paper from the board in the front of the room.



## The Babinski Reflex

The Babinski's reflex is one of the infantile reflexes. This emerges during the first week of life and is inhibited or suppressed by 12 months after birth (24 at the very, very latest).

If you lift up a baby's foot and with a blunt probe go up the outside of the foot, then across to under the big toe, what you will find is that the toes fan and the big toe elevates. This is normal in younger children, but abnormal after about 2 years old. In people more than 2 years old, the presence of a Babinski's reflex indicates damage to the nerve paths connecting the spinal cord and the brain (the corticospinal tract). Because this tract is right-sided and left-sided, a Babinski's reflex can occur on one side or on both sides.

This Babinski's reflex should be transformed into an adult Plantar reflex, and the test should result in a slight flicking of the toes.

It is associated with the upper motor neurons, the pyramidal tract.

An abnormal Babinski's reflex can be temporary or permanent.



## Schematic

Age	Gross Motor	Fine Motor	Language / Cognitive	Reflexes	Visual
<b>4 weeks</b>				Moro reflex active Stepping and placing reflexes active Grasp reflex active	May fixate face or light in line of vision
<b>2 months</b>	Lifts head up for several seconds while prone	Keeps hands predominantly fixed	Startles to loud noise Smiles responsively Begins to vocalize single sounds Listens to voices and coos		Watches people Follows with eyes and head over 90° arc
<b>3 months</b>	Lifts head up above body plane and holds position Holds an object briefly when placed in hand	Occasionally holds hands fisted	Smiles and vocalizes when talked to Laughs		Turns head toward object, fixes and follows fully in all directions with eyes Watches own hands, stares at faces
<b>4 months</b>	Holds head steady while in sitting position	Reaches for an object, grasps it, brings it to mouth	Turns head in direction of sound Smiles spontaneously	Asymmetric tonic neck reflex gone Makes defensive movements or selective withdrawal reactions	
<b>4 - 6 months</b>				Moro reflex gone	

<b>Age</b>	<b>Gross Motor</b>	<b>Fine Motor</b>	<b>Language / Cognitive</b>
<b>5 - 6 months</b>	Lifts head while supine  Rolls from prone to supine  Lifts head and chest up in prone position  Exhibits no head lag  Sits with support	Transfers object from hand to hand	Babbles  Localizes direction of sound
<b>7 - 8 months</b>	Sits in tripod fashion without support  Stands briefly with support  Reaches out for people	Thumb-finger grasp  Bangs object on table  Mouths all objects	Says "da-da," "ba-ba"
<b>9 - 10 Months</b>	Sits well without support, pulls self to sit  Stands holding on	Drinks from cup with assistance	Waves "bye-bye"
<b>11 - 12 months</b>	Walks with assistance  Creeps well	Assists in dressing  Uses pincer grasp	Understands a few simple commands  Uses two to four words with meaning
<b>13 - 15 months</b>	Walks by self - falls easily	Scribbles with crayon	Says several words, uses jargon  Points to things wanted  May name a familiar object
<b>18 months</b>	Climbs stairs with help, climbs up on chair  Throws ball  Feeds self	Takes off clothes  Builds 2-4 block tower	Points to 2-3 body parts  Uses many intelligible words  Average of 10 words
<b>24 months</b>	Runs, walks up and down stairs alone (both feet per step)  Kicks ball	Turns single pages of book  Builds 4-6 block tower	Speaks in 2-3 word sentences  Uses pronouns "you," "me," "I"
<b>30 months</b>	Jumps with both feet.	Unbuttons  Holds pencil in adult manner	Understands the concept of "I"

<b>Age</b>	<b>Gross Motor</b>	<b>Fine Motor</b>	<b>Language / Cognitive</b>
<b><i>3 years</i></b>	Pedals tricycle Alternates feet up stairs	Copies a circle Can partially dress herself	Minimum 250 words Three-word sentences Uses plurals and past tense. Pretends in play
<b><i>4 years</i></b>	Hops, skips, alternates feet down steps	Copies square Catches ball Dresses self, including buttons	Knows colors Can sing a song from memory Asks questions
<b><i>5 years</i></b>	Jumps over obstacles Alternates feet to skip	Copies triangles Ties shoes Spreads with a knife	Prints name Asks what printed or verbal words mean

Please note that the first page of this overview has more columns. This is correct.

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Stichting Kinesiologisch Netwerk Nederland

Child Neurology Net

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Cover picture is of Alex Grey

(<http://www.alexgrey.com/> )

## *Professionals*

In the reference list are organizations mentioned, you could consider to consult in case you have recognized the symptoms of certain primary reflexes at your self or at your child.

In the Netherlands Margaret Mulder is not only a professional you can consult, she is also an (international) trainer on this topic.



### *Some examples: FPR*

- A very capable woman with a flourishing business recently came for a balance regarding her fear of being home alone. It was clear that resolving Fear Paralysis was called for. The session had excellent results, and I got a call from her a few days later and learned that she was now completely comfortable at home alone, and none of her old fear remained. A few weeks later I heard from her again. She had just come back from a ski weekend in Utah. Previously she had stuck to the easiest slopes, but this time she thought, "Why can't I go down these other slopes? They look like a lot more fun!" She found herself skiing aggressively and joyfully, truly "throwing herself into it." That night back at the ski lodge she realized what she'd done, and thought immediately of her balance for Fear Paralysis. While she had taken appropriate precautions to remain safe, there had been no feeling of fear the entire day.
- Karen has the first reflex of all, the Fear Paralysis Reflex, still strongly "on." Her body is constantly under "red alert:" hypersensitive to touch and sound, constantly complaining that people hit her, when the truth is they only brush by her as they pass in the crowded hallway or make other casual contact. She is very uncomfortable in tight clothing or in sleeping bags. People with FPR still "on" may even suffer from "selective mutism," being extremely non-verbal away from home, for example; their mind/body system is so overwhelmed by stress that the vocal cords actually become temporarily paralyzed.
- Another person, Jana, age thirteen, to deal with some very challenging issues. Jana was simply unable to be away from her mother. She could tolerate her mother going to work if she herself was at school, but was unable to wait at the bus stop in the morning without her mother waiting in the car until the bus got there. Her mother could go nowhere in the evenings or on weekends without Jana. After a series of doctor's diagnosed Jana as simply ADD, her parents tried everything from hypnosis to a variety of alternative treatment methods. Nothing had any effect. Jana's balance session focused on being able to be anywhere, regardless of where her mother was. The specific process that was called for here was a balance to resolve the Fear Paralysis Reflex. At the end of the balance Jana reported feeling "really different... and good!" And her trip to church camp the next weekend, where she waved goodbye to her mother and never gave her, another thought the entire time, was a great experience. A few weeks later she turned to her mother and said, "Mom, school is only two miles away. Can't I just ride my bike there every day?"

- Ron, would always jump at unexpected noises. A career police officer, he'd always dreaded his yearly visit to the shooting range to maintain his marksman rating. Now retired, even the sound of the phone ringing next to him caused him to jump. Having had two heart bypass surgeries, he decided it was time to do something about his extreme reactions. Of course, his balance session called for resolving Fear Paralysis Reflex. Immediately following his first session Ron reported that he no longer jumped at the sound of the phone. He said, "I find myself just turning my head and thinking, 'Oh, the phone is ringing.' Before that you'd have had to peel me off the ceiling." Not long after, Ron and his wife were out for the evening with two other couples, and they enjoyed dancing all evening. Ron told me, "I'd always hated dancing, you couldn't make me dance in public. I always worried what people were thinking about how I danced. This time I just didn't care what anybody thought and you know what? I had a great time!"

As you can see from each of these client stories, when you resolve the Fear Paralysis Reflex, you resolve a lot more than the issue that might have prompted you to come for the session in the first place. You're resolving the tendency toward fear itself.

### *Some generic kid examples*

- Edwin, is ten years old and very quiet, but is not courageous enough to do anything. In class he does not say a word and every time he is asked to answer a question or to tell something he turns very red or completely pale (*MORO*). Even though his teacher is very nice to him hardly any sound can be heard from him. He would prefer to get away "I can't do it, it would not work, "I do not want to", is all he whispers (*With-DRAWN – like FPR, MORO*). At home he can draw for hours, but at school he gets nothing done. He does know exactly however who is and is not there. He watches everybody, he reacts on every sound (*MORO*) and he needs complete silence when he must concentrate on something. He is not able to catch a ball with sports (*ATNR*), because his muscular movement development stays behind. He is not a good swimmer (*STNR*) either. All of the time he is tired and he is not able to fall asleep at night. Often he suffers from asthmatic attacks.

- Ellen works really hard. At home she spends hours on school homework while she is just in fourth grade. She wants to know every thing exactly. When something changes suddenly she becomes upset and unapproachable. She has little flexibility and tries to control everything. During busy times in class or at home she gets red spots and eczema (*MORO*). When she reads out loud in class she spells every word. All school activities take a long time. It just needs to be perfect. It appears as if she is constantly under stress. Just the way she moves... With tense shoulders and contracted chest (*ATNR and/or TLR*). She wears glasses to read the blackboard. Often she is very sensitive to people and tells them things that are never told to her, but are correct.

*Note: For a person with an active ATNR it is very difficult to make crossing movements with the eyes. This has impact for example when reading. TLR is causing problems, when switching focus from objects close by to objects further away (like from notebook to blackboard). When a classroom or office is illuminated by TL – the light is switching 50 or 60 times per second. This is already quite tiring for a healthy person. MORO will amplify this switching effect (light vibration) and problems will increase.*

- Peter is in the third grade. He is often late for school and forgets all appointments. One always needs to repeat everything a hundred times, yet still he forgets. When he is around, you'll get dizzy from his restlessness ("*ADHD-mark*"). He never sits still (*Spinal Galant*). His movements are brisk and clumsy, and he often tips over things in the room. While he is eating, there is as much food around his plate as on it (*ATNR and/or TLR and/or STNR*). But shouldn't he be able to eat properly by now? Even walking proves to be difficult for him, since he trips over his own feet. When he falls down he puts on a tough attitude, or doesn't feel anything (*MORO*). But when one looks him straight in the eyes, he gets very upset. Then he's so edgy. Other children tease him time and again, which only increases his uncertainty. Since he does not want to let that show, he'll act tough again – causing his isolation from the other children. Yet he is very sensitive (*MORO*). It is just too bad the teachers hardly ever get to notice that side of him.
- Eric is ten years old. Most of the time he is calm, but sometimes he is just as restless as Peter. When he has a temper (*MORO*), he just beats up everything and everyone around him. In class he can't sit still and just walks around all the time, distracting everyone from their work. Writing is impossible for him (*PALMER*). He often mistakes the order of the letters (*TLR*) and he never succeeds in copying writings from the blackboard (*STNR*). When he doesn't succeed, he always walks away angrily. At home he just wants to cuddle (*MORO*). Whenever he sees his chance, he eats candy. He does have an allergy for cow milk. Sleeping over is hard for Peter and Eric, since they still wet their beds.

- Nick is eleven years old and very restless in class. He talks a lot and distracts other children from their work. He then is told off and expelled from class, because according to the teacher he bothers the other children too much. He never finishes anything and only wants to play. His grades are poor. He is behind on every subject. His teacher even doubts whether he will succeed in further education. Whenever something is not new and exciting anymore, he becomes passive. But sometimes he is full of energy, for example when he gets to talk about something that interests him. Then he makes sure he hears all the news about the subject and poses good questions. In reality Nick is totally bored. He has clear insight and is a quick learner. When he has practised enough on something new and sees he can do it, he yearns for a new challenge. His field of interest is broad, but unsatisfied. Why should he practise something he already manages? To Nick that's a stupid thing to do. *(It might be that Nick just needs more challenges at school to keep his attention).*