Primitive Reflexes- An Introduction

Thank you for having an interest in Primitive Reflexes and how they may affect your child or children you are dealing with. Interestingly they also can have a persisting effect well into adulthood. Our goal is to help the individual have their best life possible, therefore we thank you in advance for helping identify these reflexes in people and directing to where they can get some idea of how these reflexes may be affecting them and holding them back emotionally and physically.

Reflexes are defined as involuntary and arguably instantaneous movements in response to specific stimuli. Eg. Like a knee reflex is automatic so are these reflexes based on brain functions. Some of these reflexes are seen in particular age groups and should disappear at identified times during one's lifetime. There is a particular interest in the implication of their impact on learning and development.

Primitive reflexes are part of the normal developmental process. They develop during pregnancy and should be present at birth. Many primitive reflexes have been described, in our practice we test up to eighteen of these. According to authorities in paediatric neurology, the reflexes are fashioned as part of the developmental process to capacitate specific neural circuits for physiological purposes. The development of what we have as the day-to-day motor activity is facilitated by the primitive reflexes which allow for both integration and inhibition of some reflexes (Ewa, Anna and Borowicz). As a matter of principle, primitive reflexes are thought to

have a developmental role since they are supposed to help the young one to perform activities such as movement against gravity as they are incorporated within the first few months of life. Their influence on behavioural development is a subject that has been equally explored.

The most commonly examined primitive reflexes are described hereunder. The Moro reflex was first described by Ernst Moro in 1918. Clinicians globally have devised various ways of eliciting the reflexes. Generally, the infant is supported in a semi-erect position before allowing its head to drop softly onto the examiner's hands. The reflex is present if there is equal extension and abduction of the upper limbs proceeded by flexion of the same limbs. Occasionally, the child can let out an audible cry. The grasp reflex is tested by placing the examining finger against the open palm of the child. If the child achieves a tight grasp of the fingers then the reflex is present. In some instances, the grip is tight enough in that the examiner can actually lift the baby with gentle traction.

The asymmetric tonic neck reflex (ATNR) is tested by turning the infant's head to one side while they are lying supine and observing the position assumed by the arms. If the reflex is present, there is an extension of the arm on the side to which the face is turned and flexion of the arm on the contralateral side hence the typical 'fencing' posture. The parachute reflex occurs when the child is lifted by the trunk and suddenly lowered in a manner that simulates a fall and as a result, there is an extension of the arms in an effort to break 'the fall'. The converse of the ATNR is the symmetric tonic neck reflex which is tested by flexing and extending the head of the infant while on their fours. The reflex, which disappears by the third year of life is present if the child flexes

their upper limbs and extends the lower limbs on passive flexion of the head and the converse is true for extension of the head.

As alluded to earlier, all these reflexes are expected to be present only to a certain time of the child's life. The following table summarizes the timing of some of the primitive reflexes.

Table 590-2 Timing of Selected Primitive Reflexes

REFLEX	ONSET	FULLY DEVELOPED	DURATION
Palmar grasp	28 wk gestation	32 wk gestation	2-3 mo postnatal
Rooting	32 wk gestation	36 wk gestation	Less prominent after 1 mo postnatal
Moro	28-32 wk gestation	37 wk gestation	5-6 mo postnatal
Tonic neck	35 wk gestation	1 mo postnatal	6-7 mo postnatal
Parachute	7-8 mo postnatal	10-11 mo postnatal	Remains throughout life

Illustration 1: Adapted from *Nelson's Textbook of Pediatrics*, 19th Ed pg. 2798

Retained Primitive Reflexes & Development

During infancy and early life, primitive reflexes are considered abnormal if they are diminished or completely absent at a time when they are expected to be present. They can also be regarded to be abnormal if they are exaggerated (Futagi, Toribe and Suzuki pg 10). However, there has been a growing body of evidence to suggest at the potential correlation between retaining primitive reflexes and developmental or behavioral growth.

Ewa, Anna, and Borowicz document that retained reflexes have the ability to disrupt the known natural process of development. Moreover, children who have retained primitive reflexes tend to exhibit some elements of social and even educational dysfunction. Their psychological development is modestly incapacitated hence they may show altered psychomotor development (Ewa, Anna and Borowicz pg. 4). Some studies in neurophysiology suggest that the explanation

behind the developmental incapacitation in children with retained primitive reflexes may have much to do with a reflection of the maturation arrest in the children's brain. The disappearance of primitive reflexes is a hallmark of maturation of the central nervous system as the brain transits from psychomotor reflexes mediated at a brainstem level to conscious control by the cerebral cortex.

An interesting study was conducted by Konicarova and Bob in the year 2012. The two authors were also interested in the relationship between developmental reflexes with attention deficit hyperactivity disorder (ADHD). The authors studied children of school-going age who had a clinical diagnosis of ADHD and tried to correlate that with the presence of persistent primitive reflexes. In their submission, there was a conclusion that ADHD symptoms may, perhaps, be a compensation of some developmental stages in primitive relfexes such as the Moro and the Galant which may not be fully developed.

All the above studies and discussions point out the possibility of a relationship between retained primitive reflexes and developmental or behavioral disturbances.

ATNR Testing & Effect on Development

The Asymmetric Tonic Neck Reflex, is one of the important reflexes seen in the newborn. It is present at birth and disappears by the age of 6 or 7 months. Testing for it involves turning the infant's face to one side and observing their arms and legs on both sides. In presence of the reflex, the child extends the arm and leg on the ipsilateral side while limbs on the contralateral side are flexed. The position assumed is sometimes viewed as a 'fencing' position. Since the reflex is meant

to disappear within the first half of one's lifetime or thereabout, its persistence may mean a number of problems associated with neurodevelopmental concerns.

Illustration 2: Asymmetric Tonic Neck Reflex (Adapted from *Memorang*)

Persistence of the asymmetric tonic neck reflex (ATNR) is, indeed, a recognized risk factor for developmental and neurodevelopmental concern. In a study by Hagel, Dieter and Panteliadis, the authors described the persistence of the asymmetric tonic neck reflex (ATNR) and Moro as some of the most important initial symptoms of cerebral palsy. Cerebral palsy is a typically non-progressive disorder of posture and development that occurs due to insult to the developing brain of a child. Albeit there are a multiplicity of factors that may result in the disrupted motor and developmental function in these children, the persistence of ATNR in such children is ominous. Thisis an example of whre a persistent reflex can be due to more severe issues. However most priitive reflexes we see are more mild and have an affect as detailed below.

McPhillips, Hepper, and Multhern published a study in *The Lancet* during the turn of the millennium whose findings have been corroborating over the years. In their study, McPhillips proposed that the assessment of children with motor and neurological development disorder would likely benefit from remediation, which includes addressing persistent reflexes such as the ATNR. These sentiments are echoed in the publication by Jaiswal and Rahul who also gives an account of the relationship between ATNR persistence and neurocognitive dysfunction. In subjects with persistent ATNR which might occur in later ages, there is a likelihood of increase ADHD symptoms (Raboch, Bob and Konicarova pg. 1458).

From the available literature, it is possible to argue a case for the existence of a connection between primitive reflexes and developmental or behavioral disorders. The relationship with asymmetric tonic neck reflex is particularly well-cited as demonstrated in the text. There are a lot of othre reflexes that we have not detailed here and for a greater understanding of these please talk to our Drs.

Also see our (Retained Neonatal Reflex) RNR Screening form for some simple quick tests you can do to see if you have any of the priitive reflexes. In our pratice we test these more precisely.

If you think there may be someone that possible has a primitive reflex; the best way to approach is saying that you know someone who can screen for this and suggeting a referral. Gently pointing out that we can let them know if they are there or not and what they may possible be experiencing is also beneficial but not necessary. Ask us for a more in depth book on primitive reflexes.

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