

CHAPTER 2.7.1

Chiropractic Practice, Physical Modalities and Sleep

Rationale for Treatment Protocol

Sleep is a process of differentiation, where the cerebrum inhibits the sympathetic activity of the limbic system (*basal ganglia, thalamus, mesencephalon, hypothalamus, pituitary, cerebellum* and *intermediolateral column (IML) of the spinal cord*). Even though there is inhibition of these centers, they modulate themselves during the night through various feedback loops using multiple biochemical pathways, so as to assist various sleep processes.

In chapter 2, Consciousness was defined as a process that emerges from interactions of the brain, the body and the environment. It is a system capable of generating integrated information. It is an emergent quality with its own laws and activity dependant on a lower hierarchy of neuronal organization. Each hierarchy, as it emerges, increases the survivability of the entity or gives it more degrees of freedom. The other point to keep in mind is that all these emergent hierarchies only develop in response to the environment and gravity.

The body makes sense of the world through a number of process and mechanisms:

1. Initially through Reflexes
2. Sensory Perception
3. Cortical Interpretation (images, words)
4. Interiorisation and Symbolisation
5. Physical response upon the world
6. Observation
7. Listening
8. Ability to reason for future action
9. Development of cognition
 - Nervous System
 - L/R Brain Co-ordination
 - Canalisation: following a certain developmental path.

The most vital steps are the reflexes and the corresponding biochemical cascades associated with them. All sleep disorders have associated with them some aspect of compromised primitive reflexes. The neural stress or even neural excitotoxicity caused by compromised primitive reflexes leads to altered

biochemical cascades through various levels of injury and oxidative stress.

The chosen techniques or approaches (structural, biochemical, emotional, energetic, and dietary and lifestyle changes) used to treat a problem, must support the body's survival system. The chosen techniques/approaches must also fulfil the following criteria:

- Prime the body for an effective arousal and maintenance of consciousness during the day.
- Have the ability to reduce, alter, interrupt or stop the build-up of unnecessary stress on the whole body.
- Improve brain plasticity and capacity to deal with stress.
- Support biochemical processes in initiating, maintaining NREM and REM sleep, and hence increase the quality of sleep.

The most effective treatment approaches for people suffering sleep disorders have been trialed and identified by the author (Samvat). These include:

- Sleep Management (lifestyle changes)
- Balancing the central integrative centre within the nervous system using the chiropractic neurology model, the neuro-organizational-technique (NOT) and via craniopathy. I.e. Manipulation of the spinal vertebra (coupling adjustment). Appropriate manipulation of the upper cervical spine, can positively influence cortical areas involved in: perception, cognition, emotional modulation and the frontal lobe.
- Diet and nutritional supplement intervention.
- Exercise; which improves fuel delivery to the area of the brain that controls hormones and metabolism and, ultimately, sleep.
- Thought Field Therapy
- Intermittent Hypoxic Training
- Various breathing and Diaphragmatic strengthening exercises such as the Beutyko Breathing Technique.
- Light and sound methodology that has been proven to increase the activity along a certain nerve pathway that will excite a specific area of the brainstem and brain. This methodology is comparable to going to the gym and working a muscle.

INTRODUCTION

Chiropractic care involves a variety of minimally invasive approaches, with both treatment and prevention as essential elements of clinical practice. Although chiropractic adjustment (manipulation is defined as the application of a high velocity short amplitude thrust to a spinal or peripheral joint) is the signature therapy and best-known identifier of the profession, the practice of chiropractic involves more than manual therapeutics. In general, chiropractors seek to bring a holistic worldview to the doctor—patient encounter; seeking not only to relieve pain and restore neuro-musculoskeletal function, but also to support the inherent self-healing and self-regulating powers of the body. Aside from applying their diagnostic training to the evaluation of a variety of physical disorders and delivering manual adjustments and related therapeutic interventions, many chiropractors encourage patients to take an active role in restoring and maintaining health; with particular emphasis on doctor-guided self-care, through exercise and nutrition.^[1]

Spinal Pain is known to interfere with sleep. In one study, the combination of high pain intensity and the use of multiple pain descriptors were significantly associated with frequent interference with falling asleep. Frequent sleep interruption was significantly associated with the following: high pain intensity, male gender, anxiety, and a higher age at time of injury.^[2] If chiropractic procedures prove effective in relieving spinal pain, then they may play a part in improving sleep. There is sufficient evidence to demonstrate that back pain can be alleviated through chiropractic methodology.^[3]

CHIROPRACTIC NEUROLOGY

Chiropractic neurology is an emerging speciality in chiropractic developed by Ted Carrick DC, PhD, which addresses the sleep-related disorders from a functional neurology perspective; looking at different areas of the brain that are specific for sleep cycles and brain activity. Functional neurology looks at the symptoms which signify neurological deficits but are not explained by organic lesions in the nervous system; yet are usually associated with disturbances within central processing and integrating aspect of the brain. Although neural symptoms may be vague, they can still have functional neu-

ronal circuit that may be able to be stimulated, inhibited or modulated. To help determine and release the stresses that may be acting on the brain, the following areas are examined:

- Brain Hemisphericity: The central integrative state of the left cerebral cortex compare to right cerebral cortex.
- The spinal cord and the feedback loops that affect the area of the brain that controls the sleep-wake cycles.
- The integrity of the lower brain stem, cerebellum, and their projections up into the high Limbic brain (Thalamus) and into the cerebral cortex (Left & Right).

Complementary approaches can also be used in this process of assessment. E.g. The balance of neurotransmitters such as: serotonin, dopamine, GABA, norepinephrine, acetylcholine, and their effects on the brain stem. Diet and nutrition are also considered during this assessment.

Therapeutically, the goal is:

- To effect a desired change in brain activity and integration that positively affects sleep and vital centers, as well as motor activity.
- To increase or decrease activation of a specific area of the brain or brainstem that is not functioning at optimal levels for better feedback and control.

Modalities and techniques used are:

- Manipulation of the extremities.
- Manipulation of the spinal vertebra: The majority of sensory input arise from receptors within the musculoskeletal system and a large percentage of this sensory input come from receptors of upper cervical spine. Through appropriate manipulation of upper cervical spine, a qualified chiropractor can positively influence cortical areas involved in: perception, cognition, emotional modulation, sleep and the frontal lobe.
- Using vision/light or sound/music therapy. Various types of music therapy or visual stimulation or visual patterning can activate a neural pathway in a known area of the brain. It's comparable to going to the gym and working a muscle. In other words, if a certain pathway or a certain neural circuits are activated frequently

enough, it increases long-term changes within neural circuits that can be beneficial in overcoming neural deficits.

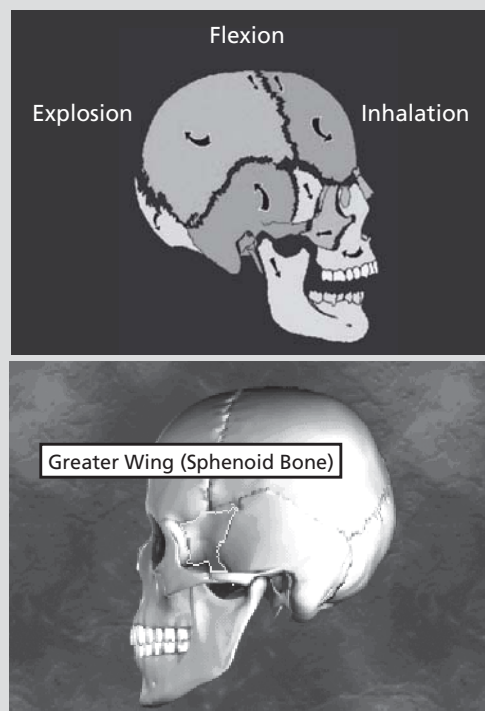
A controversial chiropractic technique that is being vigorously debated within the scientific literature is *craniosacral therapy*. *Craniosacral therapy (CST)* is used as an adjunctive therapy by physical therapists, osteopathic physicians, chiropractors and massage therapists, in treating various health conditions. It is also a popular non-pharmacological approach to the treatment or prevention of migraine headaches for which there is limited evidence of overall safety and efficacy.^[4,5,6] Craniopathy is a specialized field in chiropracticry which focuses on the health benefits of micro-motion in the bones of the skull (cranium), its distortions and the resulting ill effects. This gentle and exquisitely relaxing technique stimulates micro-motion within the cranial bones, thus enhancing the circulation of the cerebro-spinal fluid (CSF). CSF transports nutrition, removes waste products and provides an ideal and essential medium for nerve signal conduction. Its circulation is absolutely essential for maintaining good health. CST involves manually identifying restrictions in the craniosacral system (which includes: the bones, membranes and CSF that surround the brain and spinal cord), and using soft and gentle hands-on techniques to both normalize the CST fluid rhythm and correct restrictions in perispinal tissues and fascia.^[7] Manual palpation and manipulation of this system theoretically affects sensory, motor, cognitive and emotional processes in the nervous system.

"CRANIOPATHY"

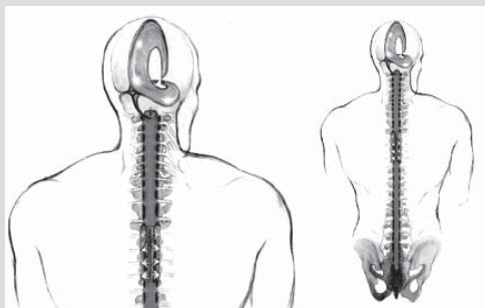
The Brain is highly vulnerable to disturbance of the blood/CSF supply. The central nervous system and the brain/spinal cord, use oxygen, glycogen and needed metabolic constituents, at a ratio of 7 to 3, compared with the other cells of the body. Anoxia lasting only a few seconds can cause neurological damage. Although the brain constitutes only 2% of the total weight of the body, it receives about 15% of the cardiac output and its oxygen is about 20% of that of the total body. Total blood flow to the brain is about 750-1000 ml/min., and the flow (per unit of mass of gray matter) is about four times that

of white matter. This blood flow feeds the CSF, which transports nutrients and oxygen to the brain cells and removes intercellular metabolic waste; thus being instrumental in maintaining the steady state of the nervous system.

Cranial Flexion – Lateral



C.S.F. is created in four compartments in the brain and is supplied to the nervous system through the gentle pulsing action created by breathing. This delicate mechanism can be interrupted by: falls, accidents, head injuries, viral infections and prolonged mental and emotional stress.

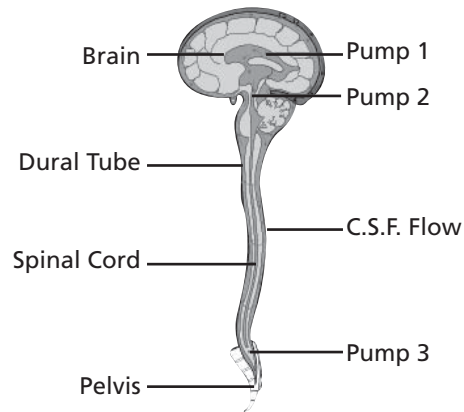


Craniopathy is concerned with two physiological phenomena relating to the moving or pumping of the CSF through the central nervous system from the cranium to sacrum and back. These two phenomena are: the cranial rhythmic impulse (CRI) and diaphragmatic – inter/intra cranial bone motion. The CRI is a very light impulse motion that develops in the foetus along with the cardiac impulse, and persists throughout life with a normal rhythm of 8-12 cycles per minute. There has been no specific impulse mechanism discovered or adequately explained, although there have been some hypothesized theories.

The most distinctive contribution that osteopathic medicine has made to contemporary medical practice is the diagnosis of somatic dysfunction and its therapy using osteopathic manipulative treatment (OMT). The techniques associated with osteopathy in the cranial field are possibly the most controversial forms of OMT. The core premise of cranial osteopathy – the primary respiratory mechanism (cranial rhythmic impulse or CRI), was first described more than 70 years ago. The primary respiratory mechanism is said to function in an oscillatory manner with inspiratory (flexion, external rotation) and expiratory (extension, internal rotation) phases.

Many low-frequency oscillations in the 6 to 9 cpm (0.1–0.15 Hz) range are found in the human body, such as: blood pressure, blood flow velocity (BFV), heart rate (R-to-R interval) variability, sympathetic tone in muscle, and intracranial fluid oscillations. These phenomena can be directly or indirectly linked to oscillations in the autonomic nervous system, particularly within the sympathetic nervous system. The CRI, with reported rates ranging from 4 to 14 cpm (0.06–0.23 Hz), shares the spectral frequency band with these aforementioned physiologic oscillations. The CRI has been shown to correspond to the low-frequency BFV in blood flow velocity. In addition, it has been demonstrated that manual cranial techniques affect BFV and similar low-frequency oscillations in intracranial fluid.^[15]

Normal Cerebro-Spinal Fluid (C.S.F.) Flow



SACRAL PUMP

A minute regular rhythmic motion between the occiput and the sacrum circulates the C.S.F. around the brain and spinal cord and throughout the nervous system. This sacral pump is the circulatory system of the brain and spinal cord, and its function is paramount in achieving & maintaining normal health.

The CRI motion may be described as a flexion/extension torsional sensation along an axis from the left occipital/temporal suture to the right speno-maxillary suture. There is a reciprocating temporal bone action with one temporal bone moving in external rotation and one in internal rotation; thereby producing a clockwise eddying flow of CSF through the brain and spinal cord tissues (this is a controversial point).

This CRI pumping motion is not of high volume, nor is its frequency variable sufficient to maintain the flow of CSF, which is needed for life's extreme metabolic demands on the central nervous system.

The second phenomena; diaphragmatic – inter/intra cranial bone motion, relates its motion cycle to that of the diaphragm on inhalation/exhalation, at an average of 16-18 cycles per minute. This pumping motion is much greater than that of the CRI and can vary in volume and frequency; as needed for the metabolic demands and cooling of the CNS.

On inhalation, the diaphragm contracts, thus expanding the lung volume from inferior, while

skeletal muscles contract to elevate the rib cage in circumference. Some important primary muscles elevating the rib cage are: the scalenus, sternocleidomastoideus (SCM), and trapezius.

The resultant contracture of these muscles on inhalation is an extension of the occiput on the spine and a flexion of the occipital/sphenoid junction (sphenobasilar) of the cranium. This in turn places the internal membranes, the falx cerebri, from anterior to posterior and tentorium laterally, into an extension state.

If there is postural compensatory sub-occipital muscular imbalance, sutural fixation from trauma or stress, or dental bite imbalance; the distortion of cranial CRI and diaphragmatic pumping motion becomes impaired. The resultant impairment of blood and CSF flow can significantly affect the neurological cellular metabolic status. This can subsequently cause additional compensatory patterns throughout the body to maintain the CNS; leading to compromised (overactive or underactive) primal reflex activities.

Many chiropractic and osteopathic spinal/pelvic problems cannot be corrected sufficiently to the satisfaction of the physician and patient, because they become compensatory to a cranial distortion or dysfunction and primitive reflexes, and thus require correction.

Craniopathy is beneficial to those with head, neck or back injuries resulting from an accident — be it from a car, sports, a work mishap or from a fall.

HOW DOES CRANIOPATHY WORK?

Craniopathy works by helping the body's natural healing mechanisms dissipate the negative effects of stress on the central nervous system.

This is accomplished through utilizing a physiological body system called the *craniosacral system*, which maintains the environment in which the central nervous system functions. It consists of the membranes and cerebrospinal fluid that surround and protect the brain and spinal cord, extending from the bones of the skull, face and mouth (which make up the cranium), down to the tailbone area (or sacrum). The role of this system in the development and performance of the brain and spinal cord is so vital that if an imbalance or dysfunction in the system occurs, it can cause sensory, motor and/or neurological disabilities.

Similarly to the pulse of the cardiovascular system, the craniosacral system has a rhythm that can be subjectively felt throughout the body. Skilled practitioners can monitor this rhythm at key body points to pinpoint the source of an obstruction or stress. Once a source has been determined, they can assist the natural movement of the fluid and related soft tissue to help the body self-correct.

CST is often used as an adjunctive therapy by physical therapists, osteopathic physicians, chiropractors and massage therapists. It is purported to reduce the use of conventional pain medications and improve daily functioning in a variety of conditions.^[8]

Table 2.7.1. A Typical Procedural Sequence involved in Craniosacral Therapy (CST) in Treating Headaches.^[9]

1. Brief review of sleep symptoms and general symptoms and assessment of any adverse effects of treatment
2. Evaluation of the craniosacral rhythm*, including amplitude, quality, and rate
3. Arcing, palpating for active lesions – checking for fascial restrictions**
4. Fascia releases at pelvis, dural tube traction, L5-S1 decompression, sacro-iliac decompression†
5. Fascia releases at lower respiratory, thoracic inlet, hyoid, and cranial base
6. Vertical membrane (falx cerebri) system evaluation and treatment using frontal and parietal bone and soft tissue manipulations
7. Horizontal membrane system (tentorium) evaluation and treatment using sphenoid and temporal bone and soft tissue manipulations
8. Mandibular compression and decompression
9. Hard palate intra-oral evaluation and treatment <ul style="list-style-type: none"> a. illary-palatine: flexion/extension, torsion, shear, compression b. vomer evaluation: flexion/extension, torsion, shear, compression c. palatine d. zygoma and nasal bones
10. Dural tube evaluation – mobility, tension and restrictions#
11. Still-point induction***
12. Global assessment with percentage improvement

* *The craniosacral rhythm is palpated by the practitioner (at the feet) and assessed for rate, quality, and symmetry. A normal rate is 8–12 cycles per minutes. A normal rhythm shows a balanced vitality.*

** *Arcing is a gentle traction technique for detecting fascial restrictions.*

† *Decompression allows for the release of joint and soft-tissue restrictions.*

Dural tube, the sheath of connective tissue surrounding the spinal cord, is evaluated through manual palpation of the spine between the occiput and the sacrum.

*** *Still point induction is a manual technique performed at the occiput, designed to bring the craniosacral rhythm to a therapeutic pause.*

Even though the scientific evidence regarding the effectiveness of this approach is limited, it should not be dismissed. To follow the debate on this new approach to treatment, one can start by reading the robust literature discussion in **Letters to the editor** on Cranial sacral therapy in: *Physical Therapy* 1995; 75(4):328-330 and references.^[10-14]

Another approach that has considerable following in the chiropractic and osteopathic community is: neuro organizational technique (NOT).

Neuro Organizational Technique (NOT)

NOT is based on the principle that the body is a self-healing, self-regulating and self-perpetuating (re-

places its own tissues) organism. These systems and their functions are organised into a network of primary survival system, known as: Fight/Flight, digestion and Reproduction. These systems must function as an integrated network to ensure efficient energy expenditure, optimum brain and nervous system plasticity and the full expression of our humanity.

This concept views the nervous system as a hierarchy that developmentally evolved, where one neuro system becomes a substrate for another, thus enhancing neural development. That is:-

1. Reptilian brain is controlled by the limbic system which is controlled by neocortex.

2. The Cerebellum receives information from the cortex about what activity it wants to perform and it communicates with Basal Ganglia to organize the sequence of activity to perform this act.
3. Once learned, this motor activity is stored in the Cerebellum. The Cerebellum stores the memory of reflexive automatic actions. When the Vestibular system is activated, it stimulates the reticular activating system (RAS) in the brain stem, which carries sensory impulses from Medulla and Pons to the midbrain and to the cortex.
4. RAS is activated in the body's sensory system (particularly to sound stimuli), in response to changes in the environment.
5. The cortex integrates sensory information from the eyes, ears and vestibular system, as well as feedback from core muscles to produce a learnt skill. I.e. it is learning from its environment and determining the appropriate response.
6. Movement also activates RAS.
7. If cerebellar, auditory and visual input, is suppressed or confused, the vestibular system takes over and initiates body movement so as to introduce new stimuli, in order to resolve the confusion. This seemingly unprovoked movement activity is sometimes mislabeled as hyperactivity, where in reality the child is trying to resolve its confused senses. It is a survival reflex mechanism that has been activated in response to stressful unresolved stimuli.

Anatomically the brain can be divided into the following hierarchy:

Reptilian Brain:

Involved in adaptation through movement (Fight/Flight, Digestion, Reproduction).

The survival system (primitive reflexes) sets the emotional limbic brain on edge. The proper maturity within the primitive reflexes assists in the proper development of limbic system.

Neurotransmitters involved in movement and the brain stem centres where they are generated:

Locus coeruleus: Norepinephrine: Arousal, Immediate response.

Ventral tegmental nuclei: Dopamine:
Body movement and Pleasure.
Medial Septal: Acetylcholine: Muscle movement.
Raphe nuclei: Serotonin: Muscle tone.

Hormones involved in Movement include:
Progesterone, Estrogen.

Limbic Brain:

Its activity is like the background music. Its role is sensory integration (it tags sensory information with a valence, mood or qualia or passion) and relay station between brain stem and cortex. It Controls the Reptilian Brain.

Neurotransmitters involved in limbic brain modulation are:

Serotonin – mood stabiliser

Dopamine – reward, pleasure, maternal feeling

Opioids – pain relief, pleasure

Norepinephrine – energy, motivation, sympathetic nervous system stimulation and excitement

GABA – stress relief, calming,

Acetylcholine – concentration, memory, modulates parasympathetic nervous system

Neuroendocrine

Hypocretin/Orexin/Histamin – wakefulness

Neuropeptide-Y: Appetite stimulation

Orexin/Histamine: wakefulness/arousal

Corticosteroids: HPA axis modulation

Prolactin/progesterone/Melatonin: Circadian Rhythm

Neo-Cortex:

Learning through memory, integration and observation. Creation of consciousness and 'self'.

Neurotransmitters: GABA (Inhibitory) and Glutamate (Excitatory)

Learning: process by which experiences change our nervous system and our behaviour. These changes are referred to as memories.

Four basic learning types are: perceptual, stimulus response, kinaesthetic, relational.

Memory storage and recall: This process requires optimal neurotransmitters synthesis and neural plasticity, to deal with real or imagined stimuli.

Memory recall is vital for the determination of appropriate response to the stimuli. The neurotransmitters that can play a role in this process are as follows:

Do you remember or did it happen? Excitation (Glutamate)

Did you create a long term memory through a 'potentiation process'? (Dopamine)

Can you recall? (Acetylcholine)

Is the memory threatening? (Noradrenalin, Cortisol)

Was the memory sad or joyful (Serotonin)

A significant component of the NOT therapy is to regulate or stabilize neural and muscular reflexes through muscular manipulation, nutritional and dietary advice and specific exercises, in order to maintain spinal curvature.

Historical Perspective on NOT Development

Dr Carl Ferreri, a chiropractic kinesiologist, in the 1970's, discovered the inter-relationship of survival reflex patterns, their sequential muscular inhibition, facilitation and corresponding cranial movements in the human body. He discovered that compromised primitive reflexes have far greater consequences on the integrity of the nervous system and its modulation of behaviour and health, than was previously thought. Over a period of 30 years, he identified neurological priorities in the body, which are necessary for optimum brain and biochemical function. Carl Ferreri, by utilising the science of kinesiology, used the muscle spindle cell to excite or inhibit all the muscles in a reflex. This was done in the sequence which has been part of the body's in-born memory, and in correlation with corresponding cranial motion within a neurological priority. The knowledge of various other sciences was used to assist in the stability of the reflex. The stimulation of the neuromuscular component of these reflexes acts as if the body is performing the movement, and hence activates its own inhibition.

Neuro Organisational Technique has drawn on the knowledge acquired from various research fields such as:

- Applied Kinesiology (Developed by George Goodheart, DC)
- Neurology
- Touch For Health (Dr John Thie, DC)
- Sacro-Occipital Technique (Dr De Jarnette, DC)
- Cranio-Sacral Therapy (Dr John Upledger, DO)
- Chiropractic (Dr D Palmer, DC)
- Neuro Lymphatic reflexes (Dr Frank Chapman, DO)
- Bennett's Reflexes or Neuro Vascular Reflexes (Dr Terrence Bennett, DC)
- Neuro Linguistic Programming (NLP)
- Traditional Chinese Medicine & Acupuncture
- Nutritional Biochemistry
- Personal Observations and trials by Dr Carl A. Ferreri, DC
- Sensory Integration (Dr. Jean Ayres , PhD)

In chapter 13 (Neuro Muscular system), we explained that the driving force behind the mechanics of the skeletal system, from micro motion of cranial bones, facial bones, pelvic bones, sacral bones and bones in the foot, to maintaining the spinal curvature, foot arch, diaphragmatic motion in respiration and movement of blood and lymph, is muscular activity. These muscular activities pattern themselves during the development of primitive reflex (fixed action pattern), as they adapt to gravity.

For instance, the emergence and strengthening in utero of a set of primitive reflexes (Moro Reflex, Tonic Labyrinthine Reflex [TLR], Asymmetrical Tonic Neck Reflex [ATNR], Symmetrical Tonic Neck Reflex [STNR], Plantar Reflex, Palmer Reflex, Rooting Reflex, and Spinal Galant Reflex), allows a baby to undergo a range of automatic and survival-orientated movements during its first three years of life. If development is normal, these primitive reflexes are progressively inhibited and gradually superseded by postural reflexes. If, however, they are retained beyond the normal three-year developmental period, the primitive reflexes have the capacity to upset the maturation process and decrease the brain's ability to efficiently process sensory information.^[19] (Refer to Table 2.7.3)

In this regard, one reflex of importance is the Moro reflex. A sudden or potentially threatening source of stress activates the primary survival Moro reflex. The Moro reflex also acts as a *gateway* in the development of the ATNR, STNR, and TLR.

Table 2.7.2. Causes that may inhibit proper function of reflexes

Physical trauma	<ul style="list-style-type: none"> – Accidents – Bumps to the head – Birth process – Sports injuries
Chemical Traua	<ul style="list-style-type: none"> – Food Allergies – Drug Interactions – Vaccines – Parasites
Environmental traua	<ul style="list-style-type: none"> – Pollutants – Exhaust fumes – Molds/mildew – Pollen
Emotional traua	<ul style="list-style-type: none"> – Death – Divorce – Abuse – Stress
Heredity	<ul style="list-style-type: none"> – Trisomy 21 (Downs Syndrome) – Inherited pattern of weakness (Miasm)

Neural reflexes are the basic activity units of the nervous system, and the way they network together can explain complex patterns of posture and movement. Thus, these reflexes are patterns of response designed to stimulate self inhibitory pathways in the brain, as the organism matures. They reflect the Bohr's principle of complementarity – the capacity to actively generate rhythmical as well as phasic motor- patterns, and the capacity of reactive behaviour; both required in order to evolve the infant's brain.^[16,17,18]

Poor development and extinction of these neural reflexes at the appropriate time creates an inordinate amount of stress on the neural system; resulting in adverse behaviours, poor sleeping patterns and expression of morbidity.

Table 2.7.3. The Function of the Moro reflex and its associated Reflexes.^[19] Note: The order of reflex inhibition and myelination patterns within the brain may be linked.

Reflex	Effect of Retained Primitive Reflexes
<p>MORO</p> <p>Emerges: 9-12 weeks in utero</p> <p>Inhibited: 2-4 months after birth</p> <p>The development and activity of this reflex coincides with the period of development of the brain stem and cerebellum; the two areas responsible for the brain's automatic and highly reactive survival-orientated functions needed to maintain primary operating control.</p>	<p>Over-reactive</p> <p>Hyperactivity, hypoactivity</p> <p>Oculo-motor problems</p> <p>Tense muscle tone, fatigue</p> <p>Poor visual perception, eyes stimulus bound, photosensitivity</p> <p>Auditory confusion</p> <p>Coordination difficulties</p> <p>Anxious</p> <p>Mood swings</p> <p>Low self-esteem</p> <p>Poor decision making qualities</p>
<p>TLR (Tonic Labyrinthine Reflex)</p> <p>Emerges: At birth</p> <p>Inhibited: 2-4 months after birth</p> <p>During the extinction phase of this reflex, the midbrain or limbic system of the brain is gaining ascendancy.</p> <p>This reflex is still present in its backward form during the developmental period (up to the 3rd year of life), when the neural connections between the vestibular, oculomotor and visual perceptual systems and the cortex are being extensively elaborated and myelinated.</p>	<p>Poor balance</p> <p>Easily disorientated</p> <p>Problems re-establishing binocular vision</p>
<p>ATNR (Asymmetrical Tonic Neck Reflex)</p> <p>Emerges 18 weeks in utero</p> <p>Inhibited: 3-9 months after birth</p> <p>During the extinction phase of this reflex, the midbrain or limbic system of the brain is gaining ascendancy.</p>	<p>Poor eye tracking</p> <p>Difficulty crossing visual midline</p>
<p>STNR (Symmetrical Tonic Neck Reflex)</p> <p>Emerges: 6-9 months after birth</p> <p>Inhibited: 9-11 months after birth</p> <p>During the extinction phase of this reflex, the midbrain or limbic system of the brain is gaining ascendancy.</p>	<p>Poor posture</p> <p>Poor eye/hand coordination</p> <p>Focussing difficulties</p>

Further Reading

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