

Introduction to NMT

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NMT: A brief historical overview

Imagine a palpation technique that becomes a means of therapeutic intervention by virtue of the addition of increased pressure.

Imagine also a palpation technique that, in a non-invasive manner, meets and matches the tone of the tissues it is addressing and sequentially seeks out changes from the norm in almost all accessible (to finger or thumb) areas of the soft tissues.

Imagine this approach as systematically providing information regarding tissue tone, induration, fibrosity, oedema, discrete localized soft tissue changes, areas of altered structure, adhesions or pain – and being able to switch from a painless and pleasant assessment mode to a treatment focus that starts the process of normalizing the changes it uncovers.

This is neuromuscular technique (NMT).

Stanley Lief

The developer of European NMT was Stanley Lief, who was born in Lutzen in the Baltic state of Latvia in the early 1890s. He was one of the five children of Isaac and Riva Lief (Riva was the author's grandfather's eldest sister, i.e. her maiden surname was Chaitow). The family emigrated to South Africa in the 1890s where Stanley was given a basic primary school education before starting work in his father's trading store in Roodeport, Transvaal.

Lief's poor health led to an interest in physical culture, one source of which was found in popular health magazines published in the USA.

Eventually Lief worked his passage to the USA in order to train under the legendary 'physical culturist' Bernard Macfadden. He qualified in chiropractic and naturopathy before World War I, and was in Britain at its outbreak. After serving in the army he returned to England and worked in institutional 'Nature Cure' (naturopathic) resorts until 1925, when he established his own clinic, Champneys, at Tring in Hertfordshire.

At this world-famous healing resort he established his reputation as a daring and pioneering healer. By using the dietetic, fasting, hydrotherapeutic and physical education and manual methods by which naturopathy aims to restore normality to the sick body, he developed a huge following. It was during his most successful years, before World War II, that he evolved the technique that this book attempts to describe.

Stanley Lief, together with his cousin Boris Chaitow, who worked as his assistant at Champneys before and during World War II, developed and refined the uses of NMT. Boris Chaitow was also born in Latvia and grew up in South Africa in the small mining town of Pilgrim's Rest, now a 'museum town', where the Chaitow trading store-cum-home still stands. He later qualified as an attorney, and was in practice with my father when he became inspired by Stanley Lief's example and, with Lief's help, trained as a chiropractor at National College, Chicago, before joining the staff at Champneys in 1937.

Associated approaches

In this book, Lief's basic NMT applications, together with a variety of specialized associated soft tissue manipulation techniques, will be presented. There will also be discussion of various reflex systems that fall within the scope of soft tissue treatment in general, and NMT in particular.

For example, detailed reference to, and illustrations of, the neurolymphatic reflexes of Chapman, together with illustrations of other reflex patterns such as myofascial trigger points, have been included.

Another of Lief's assistants at Champneys, Tom Moule, continued the development of NMT in health care, and his son, Terry Moule, has contributed his thoughts in Chapter 9, in which his

particular focus, the use of NMT in treatment of sports injuries, is briefly outlined. Another evolution of an NMT-like approach, known as Progressive Inhibition of Neuromuscular Structures (PINS), is described by its developer, Denis Dowling, in Chapter 11.

In Chapter 12 a description is given of Thai yoga massage – or rather a Western modification, which explains some of the overlaps between this ancient system, and NMT. That there is a similarity should not be surprising, since aspects of modern NMT derive from Ayurvedic techniques, as will become clear later in this chapter.

In the appendix the work and influence of Raymond Nimmo are evaluated. The lead author of this book had the opportunity to attend a course conducted by Nimmo in the 1960s in London, and was struck then by the similarity his concepts and methods had, as compared with those of Stanley Lief, the primary developer of NMT in Europe. Brief evaluations of Nimmo's work are given later in this chapter.

As a modality, NMT complements and may be incorporated into any system of physical medicine. It may – and indeed often should – be used as a means of treatment on its own, or it may accompany (preceding for preference) manipulative and other physical modalities. Its main use up to the present has been in the hands (literally) of the osteopathic profession; however, many physiotherapists, chiropractors, massage therapists and doctors of physical medicine who have studied and used NMT have found it complementary to their own methods of practice.

As it offers a simultaneous diagnostic and therapeutic capability, NMT is time-saving, energy-saving and, above all, efficient.

Other soft tissue manipulative methods such as muscle energy technique (MET) and functional positional release approaches (strain/counter-strain, for example) are commonly used as part of NMT treatment. These are briefly explained in Chapter 8: Associated Techniques.

Assessment is key

The key to the successful use of NMT is an ability to sense accurately what it is that the hands are feeling while at the same time having a clear

picture of what the particular movement or technique being employed is aimed at achieving. If the practitioner can learn to 'see', with the hands, and by using them let the patient's body 'tell its own tale', then the intelligent application of the methods described has much to offer towards the recovery of normal function.

Holistic methods of healing demand that, in order to create the situation for the maintenance or the restoration of health, the individual must be seen as a totality.

It is necessary, therefore, to attempt to recognize the various factors affecting both the internal and external environment of the individual, because these are part of the complex interacting totality that can influence the individual for good or ill. In the end, the body is self-healing, self-repairing and self-maintaining, if the prerequisites for health are present. Emotional stability, nutritional balance and hygienic considerations all play their part, as do structural and mechanical integrity.

A brief history of NMT

In Europe neuromuscular technique has evolved over the past 60 years from the original work of Stanley Lief. In the mid-1930s he was seeking improved means for preparing soft tissue structures for subsequent manipulation. The development of NMT (neuromuscular therapy) in the USA is described at the end of this chapter.

Lief had studied the work of Rabagliatti, whose book *Initis* influenced his interest in connective tissue problems.

Lief also became aware of (and studied) the work of Dr Dewanchand Varma, a practitioner of Ayurvedic manipulation (Varma called his method 'pranotherapy') who was practising in Paris. In Varma's book *The Human Machine and Its Forces* (Varma 1935), he states:

We have discovered that the circulation of the nervous currents, slows down occasionally because of the obstruction caused by adhesions; the muscular fibres harden and the nervous currents can no longer pass through them. We have demonstrated effective and positive methods designed to restore nervous equilibrium which promotes the healthy circulation of blood, so that

new tissues begin to be built up again. Our method of treatment, by the removal of all obstacles to the flow of nervous current, allows energy to proceed unimpeded.

Lief found various of Varma's techniques clinically useful, and from these ideas and methods developed his own soft tissue approach – NMT. Lief's cousin, Boris Chaitow, describes this early development of NMT as follows (B. Chaitow, personal communication, 1983):

In the middle of the 1930s Stanley Lief realised that the integrity of a joint was to a great extent related to the character of the tissues surrounding the joint, related to muscle, tendons, ligaments, blood and nerve supply etc. He felt that in order the better to achieve effective mobility and integrity of function of joints – particularly in the spine but also in all bony articular relationships – it was advisable to normalise, as best one could, the adjacent soft tissues by removing any function-interfering factors, such as tensions, contractions, adhesions, spasms, fibrositic contractures etc., with appropriate application of fingers and hands to those tissues. To this end the neuromuscular technique was evolved to cover every possible type of lesion in whatever part of the body (articular, soft tissue, abdominal, glandular, nervous, vascular etc).

It so happened that at that particular time Stanley Lief had heard of a well-known Indian practitioner named Varma operating in Paris, who was applying an unusual but very effective soft-tissue technique on patients with remarkable benefits. Lief decided to arrange to have a series of treatments on himself from Varma, and finally persuaded the latter to teach him this specialised technique. Much as he appreciated the method used by Varma, he felt it could be improved, and began to develop and subsequently practised the method for which he devised the name of 'Neuromuscular Technique'. This name was an accurate definition of the purpose of the method he evolved from the cruder technique used by Varma. NMT involved an application of hands and fingers to the appropriate areas of soft tissue related to the affected bony articulations, as well as all other areas of soft tissue which his sensitive fingers found to be abnormal in texture.

This enables adverse factors in such tissue to be corrected to allow the full function of muscles and nerves to be re-established. In doing so the double benefits are achieved in improving nerve and blood circulation, improving texture of muscle tissue and in being better able to get effective results in manipulating the bony articulations involved, and assuring lasting integrity of their normal function.

Stanley Lief also maintained that joint lesions were not the only factors in the interference in nerve force integrity, but that tensions, contractions, adhesions, muscle spasms and fibrositic contractures in soft tissues could in themselves constitute primary factors in disease (symptom) causation by reducing effective nerve and blood circulation. To this end he developed his diagnostic sensitivity with his fingers so that in a few seconds of palpation over any area of the body, he was able to assess abnormalities present in relation to tensions, adhesions and spasms.

The body's integrity, and its functional efficiency, depends not only on its chemistry influenced by the nature of the food and drink we consume, but also on the effective nerve and blood circulation free of mechanical and functional obstructions. To this second vital purpose there is no formula devised by the osteopathic or chiropractic professions that will more effectively achieve the optimum result than the philosophy and technique devised by Stanley Lief. There is no single part of the body that he was not able to apply his method to to achieve remarkable physiological responses.

Peter Lief

Stanley Lief's son, Peter (also a naturopath, chiropractor and osteopath), has described (Lief 1963) the 'neuromuscular' lesion as being associated with:

1. Congestion of the local connective tissues
2. Disturbance of the acid–base balance of the connective tissues
3. Fibrous infiltration (adhesions)
4. Chronic muscular contractions, or hypertrophic or hypotrophic (tone) changes.

The aetiology of the neuromuscular lesion, according to Stanley and Peter Lief, includes a

number of causative factors, giving rise to neuromuscular lesions, which may include:

- fatigue, exhaustion, bad posture
- local trauma
- systemic toxæmia
- lack of exercise and oxygen (ischaemia)
- dietetic deficiencies
- psychosomatic causes bringing about muscular tensions.

The presence of a 'lesion' (current terminology would define this as an area of somatic dysfunction) is always revealed by an area of hypersensitivity to pressure. It is remarkable to note just how close Lief came to defining the causes and characteristics of myofascial trigger points, although working many years before the trigger point research of Travell and Simons (Simons et al 1999, Travell, Simons & Travell 1999) (see Ch. 3).

Tissues involved in NMT

Boris Chaitow and Peter Lief have both taken part in the development and evolution of the theory and application of NMT as first described by Stanley Lief, as has Brian Youngs.

At the time of writing (2009) Youngs remains (in his ninth decade) a leading naturopathic/osteopathic practitioner in the UK. He was a colleague of both Stanley and Peter Lief, and was for many years, from the 1950s, a leading tutor at the British College of Naturopathy and Osteopathy – now the British College of Osteopathic Medicine, founded by Lief.

Youngs (1962) has given the following descriptive overview of the tissues involved in NMT.

Site of application

As the technique (NMT) operates primarily on connective tissue it will usually be concentrated at those areas where such tissue is most dense, e.g. muscular origins and insertions, especially the broad aponeurotic insertions. The most frequent sites are the superior curved line of the occiput, the numerous insertions and origins of

the large, medium and small muscles which attach to the vertebral column; the iliac-crest insertions; the intercostal insertions and abdominal-muscle insertions. Nevertheless, the technique can of course be applied to any area which requires it – head, face, wrists, etc. Connective tissue is, after all, ubiquitous.

To understand the therapeutic effect of the technique one must have some knowledge of the pathophysiology of the tissue upon which it operates. Connective tissue consists of a matrix containing cells and fibres. It was largely ignored until recently, but has now been made the subject of close study – and even international conferences – in regard to its structure and functions. Dr Rabagliatti, 45 years ago (note: Youngs was writing in the mid-1960s) was so interested and far-seeing that his book, *Initis*, contained concepts the general truth of which is being proved today. He was, however, a lone voice and because he held unorthodox ideas he was, typically, ignored.

The ubiquity of connective tissue caused Dr Rabagliatti to analogize it to the ether – as the medium for, as he termed it, ‘the zoodynamic life force’. (See Box 1.7 for current thinking along these lines.)

Through the connective tissues’ planes run the trunks and plexuses of veins, arteries, nerves, and lymphatics. Connective tissue is the support for the structural and, therefore, functional relationships of these systems.

Chemical structure

Briefly, the matrix consists of a jelly-like ground substance in which the fibres, cells, vessels, etc., lie. This ground substance is the ‘physical expression of the milieu interieure’ intervening everywhere between the blood and lymph vessels and the metabolizing cells; it plays a major role in the transport, storage and exchange of water and electrolytes. The chemical structure is essentially polysaccharide, hyaluronic acid, chondroitin sulphuric acid, chondroitin sulphate and chondroitin itself, together with proteins which contain a considerable amount of the amino acid tyrosine, which forms the majority of the thyroxine molecule.

The fibres are white fibrous (collagen), yellow (elastin), and reticulin. The collagen fibres are also protein and polysaccharide in composition and are stabilized chemically by the presence of the ground substance constituents. The presence of chondroitin sulphate, for example, renders the enzymatic breakdown of collagen much more difficult. The importance of this point will become clearer later. The formation of fibres appears to be due to a precipitation of fibre constituents by serum glycoproteins under the influence of adrenocorticotrophic hormone.

Reticulin contains more polysaccharide than collagen, and some lipid also. Elastin is also protein and polysaccharide in composition. Sulphur is a constituent of all three. Cells include fibroblasts, mast cells, macrophages and others.

A function of circulation

The nature and composition of connective tissue is a function of circulation. Circulatory efficiency in any area will determine (1) the influx of materials to the area, and (2) the drainage of the area.

Incoming blood leads to the production of lymph and this fluid permeates the ground substance, bringing all the constituents of the blood except the proteins to the connective tissue. Some of these constituents are hormones. Thyroxine, adrenoglucocorticoids and adrenomineralocorticoids are only three of these. Oestrogen and androgens are two more. All these have known effects upon the structure of connective tissue. Thus, a diminution of thyroxine leads to an increase of water retention in most cells and an increase in the quantity of ground substance. The sex hormones also do this, but of most interest to us here are the opposing groups of the adrenocortical hormones. Selye divides these into anti- and pro-inflammatory hormones (A-Cs and P-Cs). These are produced in response to stress situations and they exert both a general and a local effect. By regulating the balance between these two the body can control the ability of the tissues to produce an inflammatory response. But when the A-Cs and the P-Cs are both present in the blood the A-Cs always win

the contest, i.e., there is an anti-inflammatory response.

Stressor stimulus

The A-Cs are produced in response to a stimulus – the stressor. The stressor in neuromuscular technique is pain. Effective technique appears to be accompanied by pain in all such conditions (and also in the condition without treatment). Pain is probably due to two factors. A much reduced threshold in the area due to circulatory inhibition enabling a build up to just below the threshold level of Lewis pain substance or, alternatively, a disturbance of electrolyte level (e.g., increase of hydrogen ions or disturbance in the calcium/sodium/potassium balance due to the same circumstances). Consequently pain will be produced by even slight stimulus, let alone the heavier movements of neuromuscular technique. Also, pressure and tension proprioceptors may be overstimulated and pain can result from an over application of any ordinary stimulus.

The A-Cs liberated will produce both general effects (general adaptation syndrome) and local effects (local adaptation syndrome) and their effect is anti-inflammatory, both generally and locally, at the area of application of the stressor, i.e., at the areas of technique application. Consequently, there is a breakdown of collagen fibres and a general decrease in water retention in the ground substance; the congested area is decongested.

What Youngs has described tallies closely with what is now known about the biochemical status of tissues under stress, and particularly of the trigger point entity, which will be evaluated in following chapters.

Stanley Lief, albeit inadvertently, provided for the generation of practitioners who were to follow him a tool with which to deal with this pain-producing adaptive end-result of the multiple stresses faced by the modern musculoskeletal system.

In the latter part of the lives of Stanley Lief (d. 1963) and Boris Chaitow (d. 1996), awareness grew as to other applications of use for NMT, most notably its potential to identify and commence elimination of myofascial trigger points.

The principal author has, over the past 40 years, since working as assistant to Boris Chaitow in the early 1960s, helped to promote knowledge of NMT – particularly in its diagnostic mode – so that it stands today as a major therapeutic instrument for use by manipulative and massage therapists worldwide. The use of NMT as a broadly applicable sequential assessment and treatment tool was enhanced by exposure to the work of Raymond Nimmo in the late 1960s. Nimmo and his ‘receptor-tonus’ work seems to be a common link between ‘European’ NMT and American NMT. Descriptions of Nimmo’s work will be found in the Appendix, however a brief perspective on his influence, from one of the USA’s leading NMT teachers, Judith DeLany, is given below.

Judith DeLany’s overview of NMT in the USA

What has today become neuromuscular therapy in the USA, was spawned in the late 1970s from receptor-tonus method (the work of the late Dr Raymond Nimmo). Nimmo, a 1926 graduate of Palmer College of Chiropractic, states in his writings that he questioned many of the philosophical and theoretical teachings of his profession (Nimmo 1959). He studied many aspects of classical chiropractic even though he was convinced that adjustment of the spine was not enough to ensure the health of the individual. He also sought out information as to the role that soft tissues play in pain and dysfunction in an attempt to explain the syndromes he was confronted with in his work.

As Nimmo developed his skill in palpating muscles, he noted particular points within the muscles which, when pressed, referred pain to various distant areas. He called these ‘noxious generative points’ (NGPs). In 1952 Nimmo purchased Connective Tissue: Transactions of the Second Conference (Travell 1952), in which Janet Travell discussed her theories of trigger points. Nimmo found illustrations of referred pain patterns in Travell’s work that coincided precisely with his own discoveries. He began working obsessively to develop a sensible treatment plan and states that, as time went by, he

learned from others, but it is estimated that 80–90% of the techniques he taught were his own work.

Nimmo's constant striving to prove the physiological basis of his work, complete with integration of neurological laws that gave validity and substance to his principles of practice, derived not only from being in the forefront of a newly emerging profession, but also from the fact that his interest in the soft tissue component of the body placed him at the fringes of the teachings of that profession.

He faced peers at a time when they were attempting to validate the principles of chiropractic and asked them to question the very basis of their beliefs. His work endured and many healthcare practitioners who studied with him carried the work forward, under a variety of names (see below).

In 1979, Paul St John, who had studied receptor-tonus methodology with Nimmo, published course manuals relating to similar techniques, which he called neuromuscular therapy (NMT). His concepts were influenced by not only Nimmo (Vannerson & Nimmo 1971), but also Travell & Simons (1983), Mariano Racabado, Leon Chaitow, Rene Cailliet (1977), Aaron Mattes, John Barnes, John Upledger and others, through their writings and seminars.

Judith (Walker) Delany's professional association with St John in 1984–1989 led to revisions of previous concepts, with significant changes in treatment techniques and teaching materials, which came to include the influence of posture and craniosacral methods.

During this phase, the work of Janet Travell and David Simons had enormous influence. Their book *Myofascial Pain and Dysfunction: The Trigger Point Manual, Volume 1: The Upper Body* (Travell & Simons 1983), and numerous articles by them, began to explain in greater detail the background to what Nimmo had taught. In 1989, St John and Delany separated their work and both continue to teach neuromuscular therapy. The approaches they have taken, although still containing elements of Nimmo's original work, have now diverged, with the St John Method focusing on structural homeostasis of the body and cranium by applying the

law of cause and effect, and Delany's NMT American Version incorporating a systematic approach towards pain relief which addresses six physiological factors: ischaemia, trigger points, nerve compression/entrapment, postural distortion (biomechanics), nutritional components and emotional well-being (stress reduction).

Judith Delany provides a detailed overview of NMT American Version in its current stage of evolution in Chapter 10.

Various chiropractic perspectives on Nimmo's work

Cohen & Gibbons (1998) have detailed the chiropractic perspective on the work of Nimmo. They point out that, in a survey carried out in 1993 of procedures currently employed by chiropractors in the USA, fully 40% were using Nimmo's receptor tonus methodology, which closely approximates NMT (National Board of Chiropractic Examiners 1993).

Gatterman & Lee (1995) summarize Nimmo's approach:

Nimmo found noxious generative points [trigger points] in muscles that referred pain in characteristic patterns. Viewing these hypersensitive areas, the trigger points of Travell, as abnormal reflex arcs he developed a manual technique designed to reduce the irritable loci. He referred to the inter-relationship of muscle tonus and the central nervous system as 'reverberating circuits', whereby stimulus was self-perpetuating until the cycle was broken ... This procedure referred to by Travell as ischemic compression offers a noninvasive chiropractic technique instead of the common medical practice of injection of the painful trigger points.

To reach a point where his belief in soft tissue origin of much musculoskeletal pain was widely accepted by his own profession, Nimmo had to contend with, and overcome, the prevailing chiropractic model of 'bone on nerve' concepts. He was certainly an original thinker and his trigger point research was contemporary with, and in some ways ahead of, that of Janet Travell, the major medical researcher into this field. At the very least, Cohen & Gibbons (1998) suggest:

'The similarities are striking and suggest one concept developed concurrently by two outstanding independent researchers.'

There were, nevertheless, distinct differences between the early treatment approaches advocated by Travell, compared with those suggested by Nimmo, in the developmental years of their research into the pain generated by trigger points.

Cohen & Gibbons (1998) explain:

Travell advocated injections to the trigger points and later spray and stretch and 'ischemic compression' to relax the involved muscle. On the other hand Nimmo stated, 'I have found that a proper degree of pressure, sequentially applied, causes the nervous system to release a hypertonic muscle'. Nimmo did not see the trigger points as an object to be injected, stretched, massaged or dissolved by ultrasound.

We should recall that Nimmo's concepts were evolving in the 1950s and that, at that stage of her work, Travell was advocating injection as the primary tool for trigger point deactivation. Over the years, direct compression ('ischaemic') – now called 'trigger point release' – has become the preferred method of trigger point treatment, along with stretching (restoring the muscle housing the trigger point to its normal resting length; see Ch. 3).

Nimmo's insistence that trigger points had a neurological origin has not been validated, however, as evaluation of the latest findings of Simons et al (1999) will show (see Ch. 3). This in no way detracts from the enormous contribution made by Nimmo to this area of study. See the Appendix for more information on Nimmo's work.

References

- Cailliet R: *Soft tissue pain and disability*, Philadelphia, 1977, FA Davis.
- Cohen J, Gibbons R: Raymond L Nimmo and the evolution of trigger point therapy 1929–1986, *J Manipulative Physiol Ther* 21(3):167–172, 1998.
- Gatterman M, Lee H: Chiropractic adjusting techniques. In Peterson D, Weise G, editors: *Chiropractic: an illustrated history*, Chicago, 1995, Mosby, pp 240–261.
- Lief P: British Naturopathic, *British Naturopathic Journal* 5(10):304–324, 1963.
- National Board of Chiropractic Examiners: *Job analysis of chiropractic*, Colorado, 1993, Greely.
- Nimmo R: Factor X. The Receptor (1) 4. Reprinted in Schneider M, Cohen J, Laws S, editors: 2001 *The collected writings of Nimmo and Vannerson, pioneers of chiropractic trigger point therapy*, Pittsburgh, 1959, Self-published.
- Simons D, Travell J, Simons L: *Myofascial pain and dysfunction: the trigger point manual*, vol. 1, Upper half of body, ed 2, Baltimore, 1999, Williams & Wilkins.
- Travell J: *Connective tissue: transactions of the second conference*, New York, 1952, The Josiah Macy Jr Foundation.
- Travell J, Simons D: *Myofascial pain and dysfunction: the trigger point manual*, vol. 1, The upper body. Baltimore, 1983, Williams & Wilkins.
- Vannerson J, Nimmo R: Specificity and the law of facilitation in the nervous system, *The Receptor* 2(1). Reprinted in Schneider M, Cohen J, Laws S, editors: 2001, *The collected writings of Nimmo and Vannerson, pioneers of chiropractic trigger point therapy*, Pittsburgh, 1971, Self-published.
- Varma D: *The human machine and its forces*, London, 1935, Health for All.
- Youngs B: Physiological background of neuro-muscular technique, *British Naturopathic Journal* 5(6):176–190, 1962.