

Appendix 1

Soft tissue manipulation fundamentals

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NEUROMUSCULAR TECHNIQUE (NMT) (Chaitow 2003) (with example of NMT treatment of the mimetic, palatine and tongue muscles: see Box A1.1)

- NMT aims to produce modifications in dysfunctional tissue, encouraging a restoration of normality, with the primary focus of deactivating focal points of reflexogenic activity such as myofascial trigger points.
- An alternative aim of NMT is to normalize imbalances in hypertonic and/or fibrotic tissues, either as an end in itself or as a precursor to rehabilitation.
- NMT relies on physiological responses involving neurological mechanoreceptors, Golgi tendon organs, muscle spindles and other proprioceptors, in order to achieve the desired responses.
- Insofar as they integrate with NMT, other means of influencing such neural reporting stations form a natural set of allied approaches, including positional release (SCS – strain/counterstrain) and muscle energy methods (MET – indeed, many European practitioners speak of MET as ‘NMT’ (Dvorak & Dvorak 1984).
- Traditional massage methods which encourage a reduction in the retention of metabolic wastes, and which enhance circulation to dysfunctional

tissues, are included in this category of allied approaches (Rich 2002).

- NMT can usefully be integrated in treatment aimed at postural reintegration, tension release, pain relief, improvement of joint mobility, reflex stimulation/modulation or sedation. There are many variations of the basic technique as developed by Stanley Lief and his cousin Boris Chaitow, the choice of which will depend upon particular presenting factors or personal preference. Similarities between some aspects of NMT and other manual systems should be anticipated since techniques have been 'borrowed' from other systems where appropriate (Chaitow 1992).
- NMT can be applied generally or locally and in a variety of positions (sitting, lying, etc.). The order in which body areas are dealt with is not regarded as critical in general treatment but is of some consequence in postural reintegration.

The methods described are in essence those of Stanley Lief and Boris Chaitow, both of whom achieved an unsurpassed degree of skill in the application of NMT. Boris Chaitow (personal communication, 1983) has written:

The important thing to remember is that this unique manipulative formula is applicable to any part of the body for any physical and physiological dysfunction and for both articular and soft tissue lesions.

To apply NMT successfully it is necessary to develop the art of palpation and sensitivity of fingers by constantly feeling the appropriate areas and assessing any abnormality in tissue structure for tensions, contractions, adhesions, spasms.

It is important to acquire with practice an appreciation of the 'feel' of normal tissue so that one is better able to recognize abnormal tissue. Once some level of diagnostic sensitivity with fingers has been achieved, subsequent application of the technique will be much easier to develop. The whole secret is to be able to recognize the 'abnormalities' in the feel of tissue structures. Having become accustomed to understanding the texture and character of 'normal' tissue, the pressure applied by the thumb in general, especially in the

spinal structures, should always be firm, but never hurtful or bruising. To this end the pressure should be applied with a 'variable' pressure, i.e. with an appreciation of the texture and character of the tissue structures and according to the feel that sensitive fingers should have developed. The level of the pressure applied should not be consistent because the character and texture of tissue is always variable. These variations can be detected by one's educated 'feel'. The pressure should, therefore, be so applied that the thumb is moved along its path of direction in a way which corresponds to the feel of the tissues.

This variable factor in finger pressure constitutes probably the most important quality a practitioner of NMT can learn, enabling him to maintain more effective control of pressure, develop a greater sense of diagnostic feel, and be far less likely to bruise the tissue.

Compare this description involving 'variable' pressure with that of Pick in Chapter 12, where he describes the 'working level' used in cranial therapy – see Figure 12.1.

NMT thumb technique

- Thumb technique as employed in NMT in either assessment or treatment modes enables a wide variety of therapeutic effects to be produced. The tip of the thumb can deliver varying degrees of pressure via any of four facets: the very tip may be employed or the medial or lateral aspect of the tip can be used to make contact with angled surfaces. For more general (less localized and less specific) contact, of a diagnostic or therapeutic type, the broad surface of the distal phalange of the thumb is often used.
- It is usual for a light, non-oily lubricant to be used to facilitate easy, non-dragging, passage of the palpating digit.
- For balance and control the hand should be spread, tips of fingers providing a fulcrum or 'bridge' in which the palm is arched in order to allow free passage of the thumb towards one of the fingertips as the thumb moves away from the practitioner's body.



- During a single stroke, which covers between 2 and 3 inches (5–8 cm), the fingertips act as a point of balance while the chief force is imparted to the thumb tip via controlled application through the long axis of the extended arm of body weight. The thumb therefore never leads the hand but always trails behind the stable fingers, the tips of which rest just beyond the end of the stroke.
 - Unlike many bodywork/massage strokes, the hand and arm remain still as the thumb, applying variable pressure, moves through its pathway of tissue. The extreme versatility of the thumb enables it to modify the direction of imparted force in accordance with the indications of the tissue being tested/treated.
 - As the thumb glides across and through those tissues it becomes an extension of the practitioner's brain. In fact, for the clearest assessment of what is being palpated the practitioner should have the eyes closed so that every minute change in the tissue can be felt and reacted to.
 - The thumb and hand seldom impart their own muscular force except in dealing with small localized contractures or fibrotic 'nodules'. In order that pressure/force be transmitted directly to its target, the weight being imparted should travel in as straight a line as possible, which is why the arm should seldom be flexed at the elbow or the wrist by more than a few degrees.
 - The positioning of the practitioner's body in relation to the area being treated is also of the utmost importance in order to facilitate economy of effort and comfort. The optimum height vis-à-vis the couch and the most effective angle of approach to the body areas being addressed must be considered and the descriptions and illustrations will help to make this clearer.
 - The degree of pressure imparted will depend upon the nature of the tissue being treated, with a great variety of changes in pressure being possible during strokes across and through the tissues.
 - When being treated, the patient should not feel strong pain but a general degree of discomfort is usually acceptable as the seldom stationary thumb varies its penetration of dysfunctional tissues.
 - A stroke or glide of 2–3 inches (5–8 cm) will usually take 3–5 seconds, seldom more unless a particularly obstructive indurated area is being dealt with. If reflex pressure techniques or ischemic compression are being employed, a much longer stay on a point will be needed but in normal diagnostic and therapeutic use the thumb continues to move as it probes, decongests and generally treats the tissues.
 - It is not possible to indicate the exact pressures necessary in NMT application because of the very nature of the objective which, in assessment mode, attempts precisely to meet and match the tissue resistance, to vary the pressure constantly in response to what is felt. (Compare this description with that of Pick in Chapter 12, where he describes the 'working level' used in cranial therapy – see Fig. 12.1.)
- In subsequent or synchronous (with assessment) treatment of whatever is uncovered during evaluation, a greater degree of pressure is used and this will vary depending upon the objective – whether this is to inhibit, to produce localized stretching, to decongest and so on. Obviously on areas with relatively thin muscular covering the applied pressure would be lighter than in tense or thick, well-covered areas such as the buttocks.
- Attention should also be paid to the relative sensitivity of different areas and different patients. The thumb should not just mechanically stroke across or through tissue but should become an intelligent extension of the practitioner's diagnostic sensitivities so that the contact feels to the patient as though it is sequentially assessing every important nook and cranny of the soft tissues. Pain should be transient and no bruising should result if the above advice is followed.
 - The treating arm and thumb should be relatively straight since a 'hooked' thumb, in which all the work is done by the distal

phalange, will become extremely tired and will not achieve the degree of penetration possible via a fairly rigid thumb.

NMT finger technique

- In certain localities the thumb's width prevents the degree of tissue penetration suitable for successful assessment and/or treatment and the middle or index finger can usually be suitably employed in such regions.
- The most usual area for use of finger rather than thumb contact is in the intercostal musculature and in attempting to penetrate beneath the scapula borders in tense fibrotic conditions.
- The middle or index finger should be slightly flexed and, depending upon the direction of the stroke and density of the tissues, supported by one of its adjacent members. As the treating finger strokes with a firm contact and usually a minimum of lubricant, a tensile strain is created between its tip and the tissue underlying it. This is stretched and lifted by the passage of the finger which, like the thumb, should continue moving unless or until dense, indurated tissue prevents its easy passage. These strokes can be repeated once or twice as tissue changes dictate.
- The ideal angle of pressure to the skin surface is between 40° and 50°.
- The fingertip should never lead the stroke but should always follow the wrist, the palmar surface of which should lead as the hand is drawn towards the practitioner.
- It is possible to impart a great degree of pull on underlying tissues and the patient's reactions must be taken into account in deciding on the degree of force to be used. Transient pain or mild discomfort is to be expected but no more than that. All sensitive areas are indicative of some degree of dysfunction, local or reflex, and are thus important and their presence should be recorded. The patient should be told what to expect so that a co-operative unworried attitude evolves.

- Unlike the thumb technique, in which force is largely directed away from the practitioner's body, in finger treatment the motive force is usually towards the practitioner. The arm position therefore alters and a degree of flexion is necessary to ensure that the pull or drag of the finger across the lightly lubricated tissues is smooth.
- Unlike the thumb, which makes a sweep towards the fingertips whilst the rest of the hand remains relatively stationary, the whole hand will move as finger pressure is applied. Certainly some variation in the degree of angle between fingertip and skin is allowable during a stroke and some slight variation in the degree of 'hooking' of the finger is sometimes also necessary. However, the main motive force is applied by pulling the slightly flexed middle or index finger towards the practitioner with the possibility of some lateral emphasis if needed. The treating finger should always be supported by one of its neighboring digits.

Application of NMT

- It should be clear to the practitioner that underlying tissues being treated should be visualized and, depending upon the presenting symptoms and the area involved, any of a number of procedures may be undertaken as the contact digit(s) moves from one site to another. There may be superficial stroking in the direction of lymphatic flow, direct pressure along the line of axis of stress fibers, deeper alternating 'make and break' stretching and pressure, traction on fascial tissue or sustained compression, as in trigger point treatment (see INIT description later in the chapter, and also Box A1.1).
- As variable assessment pressure is being applied the practitioner needs to be constantly aware of diagnostic information being received via the contact digits, as this is what determines the variations in pressure, and the direction of force, to be applied therapeutically.
- Ideally any changes in direction or degree of applied pressure should take place without any

Box A1.1 Soft tissue treatment of mimetic, palatine and tongue muscles

The notes that follow have been adapted from Chapter 12, *Clinical applications of neuromuscular technique* (Chaitow & DeLany 2000).

Assessment and treatment of the majority of cranial and facial muscles will be found in Chapter 9. Examples are given below of neuromuscular treatment of some of the muscles of expression, the mimetic muscles and those associated with the soft palate and tongue.

The muscles of expression (see Fig. 9.17)

Facial expression largely depends on mimetic muscles that attach skin to skin, skin to underlying fascia or skin to bone.

Mimetic muscles can be divided into four regions that work to produce often unconscious muscular movements that represent the wide variety of emotions experienced in life (*Gray's Anatomy* 1999, Platzer 1992):

- scalp (epicranial)
- eyelids (circumorbital and palpebral)
- nasal
- mouth (buccolabial).

Those mimetic muscles most involved in head and facial pain are discussed below. Orthodontic and cranial influences of the muscles of expression have yet to be fully established. Latey (1996) has observed that he has seldom seen anyone suffering from migraine headaches who has a normal range of facial expression.

Mimetic muscles of the epicranium

The scalp is composed of five layers. The first three (skin, subcutaneous tissue and epicranium, with its aponeurosis) are considered a single layer since they remain connected when torn or surgically reflected.

The deeper subaponeurotic areolar tissue allows the scalp to glide on the deepest layer, the pericranium. The epicranial muscles express surprise, astonishment, attention and fright and are used when glancing upwards. When pulling from below, the frontalis can draw the scalp forward, as in worry, grief or sadness, often in combination with other brow muscles.

NMT of the muscles of the epicranium The practitioner sits at the head of the supine patient. A pillow may be placed under the head. Rotation of the head will be necessary to reach the posterior aspect.

Transverse friction and small, circular massage techniques may be applied to the entire cranial surface to soften the superficial fascia. Tender areas may be treated with combination friction or static pressure. Special attention should be applied to cranial suture lines, where undue tenderness may indicate a need for further cranial attention.

Direct manual release of fascial restrictions in occipitofrontalis is suggested (see Ch. 9 for descriptions). Methods to release such restrictions can include NMT, massage methods, myofascial release and positional release approaches. NMT can be assisted by an isometric contraction of the muscle. A 7–10 second, strongly held frown will reduce hypertonicity and allow easier manual treatment of the soft tissues.

Mimetic muscles of the circumorbital and palpebral region

Orbicularis oculi and corrugator supercilii comprise the mimetic muscles of the eye region (palpebral fissure). These are important for facial expression and also ocular reflexes. As with all mimetic muscles, they are innervated by the facial nerve.

Orbicularis oculi is divided into three parts.

- The orbital portion of orbicularis oculi encircles the eye and lies on the body orbit.
- The palpebral portion lies directly on the upper and lower eyelids.
- The short, small fibers of the lacrimal portion cross the lacrimal sac and attach to lacrimal crest.

Orbicularis oculi is responsible for closing the eye voluntarily or reflexively, as in blinking. It also aids in reducing the amount of light entering the eye and hence is involved with squinting. Levator palpebrae superioris antagonizes eye closure by elevating the upper eyelid.

Corrugator supercilii blends with the frontalis muscle and the orbicularis oculi and radiates into the skin of the eyebrows, drawing the brows toward the midline.

These two muscles create vertical furrows between the brows that, over time, can become deeply entrenched. Orbicularis oculi also produces radiating lateral lines - 'crow's feet' - and expresses worry or concern, while corrugator supercilii produces expressions associated with thinking hard.

Box continues

Box A1.1 Soft tissue treatment of mimetic, palatine and tongue muscles—continued

NMT for the palpebral region The eye region contains delicate tissues and should be treated gently. Care should be exercised to avoid stretching the skin of the eye region.

Flat palpation is used to press fingertip portions of the orbicularis oculi against the underlying bony orbit. Gentle static pressure or gentle transverse movement may help assess the underlying muscle.

The corrugator supercilii is easily picked up near the midline between the brows and compressed between the thumb and side of the index finger (see Fig. A1.1). It can also be rolled gently between the palpating digits. This compression and rolling technique is applied at thumb-width intervals across the width of the brow and may also include fibers of the procerus, frontalis and orbicularis oculi, as well as corrugator supercilii.

Mimetic muscles of the nasal region

- Procerus arises from the facial aponeurosis over the lower nasal bone and nasal cartilage and attaches into the skin of the forehead, between the eyebrows. It reduces glare and produces transverse wrinkles at the bridge of the nose. Expressions associated with procerus include menacing looks, frowns and deep concentration.
- Nasalis consists of a transverse (compressor naris) portion, that attaches the maxilla to the bridge of the nose, and an alar (dilator naris) portion, that attaches the maxilla to the skin on the nasal wing. The

transverse portion compresses the nasal aperture while the alar portion widens it, reducing the size of the nostril and producing a 'desiring' look.

- Depressor septi attaches the mobile portion of the nasal septum to the maxilla above the central incisor tooth. It depresses the septum during constriction and movement of the nostrils.
- Levator labii superioris alaeque nasi attaches the skin of the upper lip and nasal wing to the infraorbital margin. When it contracts, it enlarges the nostrils and elevates the nasal wing, producing transverse folds in the skin on each side of the nose and a look of displeasure, such as when sniffing an unpleasant odor.

NMT for nasal region Procerus can be grasped between the fingers and thumb at the bridge of the nose.

Flat palpation and light friction may be used along the sides of the nose and spreading slightly laterally onto the cheeks to treat the remaining nasal muscles. The two index fingers, very lightly placed, provide precise myofascial release. The facial tissues are very delicate and anything other than light pressure is contraindicated.

Mimetic muscles of the buccolabial region

Movements of the lips derive from a complex system that postures the lips and controls the shape of the orifice. *Gray's Anatomy* (1999) details the following muscles of this area.



Figure A1.1 Compression and precise myofascial release may soften deep vertical furrows between the brows.

Box A1.1 Soft tissue treatment of mimetic, palatine and tongue muscles—continued

- Elevators, retractors and evertors of the upper lip: levator labii superioris alaeque nasi, levator labii superioris, zygomaticus major and minor, levator anguli oris and risorius
- Depressors, retractors and evertors of the lower lip: depressor labii inferioris, depressor anguli oris and mentalis
- Compound sphincter: orbicularis oris, incisivus superior and inferior
- Buccinator.

The buccolabial muscles are involved in eating, drinking and speech, as well as emotional expressions such as reserve, laughing, crying, satisfaction, pleasure, self-confidence, sadness, perseverance, seriousness, doubt, indecision, disdain, irony, etc. (*Gray's Anatomy* 1999, Platzer 1992).

A number of these muscles converge into the modiolus just lateral to the buccal angle of the mouth. This can be palpated in an intraoral examination and is usually felt as a dense, mobile fibromuscular mass which may or may not be tender. This fan-shaped radiation of muscular fibers helps integrate facial activities of the lips and oral fissure, cheeks and jaws, such as chewing, drinking, sucking, swallowing and modulations of various vocal tones.

NMT for buccolabial region An intraoral examination including the labial area will address the muscles in this region. The practitioner should wear protective gloves. Precautions relating to latex allergy should be adopted (NIOSH 1997).

The gloved index finger is placed inside the mouth and the thumb is placed on the outside (facial) surface. The tissue is compressed between the two digits as the internal finger is slid against the external thumb while manipulating the tissue held between them. The treating digits progress at thumb-width intervals around the mouth until all the tissues have been examined. Tender spots or trigger points may be treated with static pressure (Simons et al 1998).

Musculature of the soft palate

The soft palate is a mobile muscular flap that hangs down from the hard palate with its posterior border free and, when elevated, closes the passageway between the nasopharynx and the oropharynx. The uvula hangs from the posterior border and, when relaxed, rests on the root of the tongue. The elevated uvula aids the tensor and

levator veli palatini muscles in sealing off the nasopharynx. Adjacent are the palatine tonsils and the sharp hamulus, around which the tensor veli palatini turns to radiate horizontally into the palatine aponeurosis (see Fig. A1.2).

The palatine musculature includes levator and tensor veli palatini, palatoglossus, palatopharyngeus and musculus uvula. Innervation to the soft palate musculature is controversial (*Gray's Anatomy* 1999), possibly including the vagus, trigeminal, mandibular, glossopharyngeal and facial nerves. These muscles are involved in swallowing and speech.

Levator veli palatini is a cylindrical muscle which courses from the petrous portion of the temporal bone, the carotid sheath and the inferior aspect of the cartilaginous part of the auditory tube to blend into the soft palate and palatine aponeurosis. This muscle pulls the soft palate upward and backward. It has little effect on the pharyngotympanic tube (*Gray's Anatomy* 1999).

Tensor veli palatini is a thin, triangular muscle attaching to the root of the pterygoid process, the spine of the sphenoid bone and the membranous wall of the pharyngotympanic (auditory) tube. It wraps around the hamulus before attaching to the palatine aponeurosis, which it elevates during swallowing. Its primary role is to open the entrance to the auditory tube, to equalize air pressure during swallowing (Clemente 1987).

Ear infections in young children and their relationship with tensor veli palatini hypertonicity deserve clinical research. Such infections occur most frequently in young children during the chronic sucking stage (thumbs, fingers, pacifiers, toys, nipple of the bottle or breast).

The paired uvulae muscles attach the uvula to the hard palate and soft palate. They radiate into the uvular mucosa, elevating and retracting to seal off the nasopharynx. The uvula may contain trigger points which induce hiccups (Simons et al 1998, Travell 1977).

NMT for soft palate The patient tilts the head into extension and breathes through the mouth slowly or holds the breath to inhibit the gag reflex. A confident but not aggressive finger pressure is used to avoid a tickling sensation which might cause gagging.

The gloved index finger is placed just lateral to the midline of the hard palate and glides posteriorly on the hard palate until it reaches the soft palate. No pressure should be placed on the palatine bones or the vomer.

The finger is hooked into a 'C' shape as it sinks into the soft palate posterior to the palatine bone and sweeps

Box continues

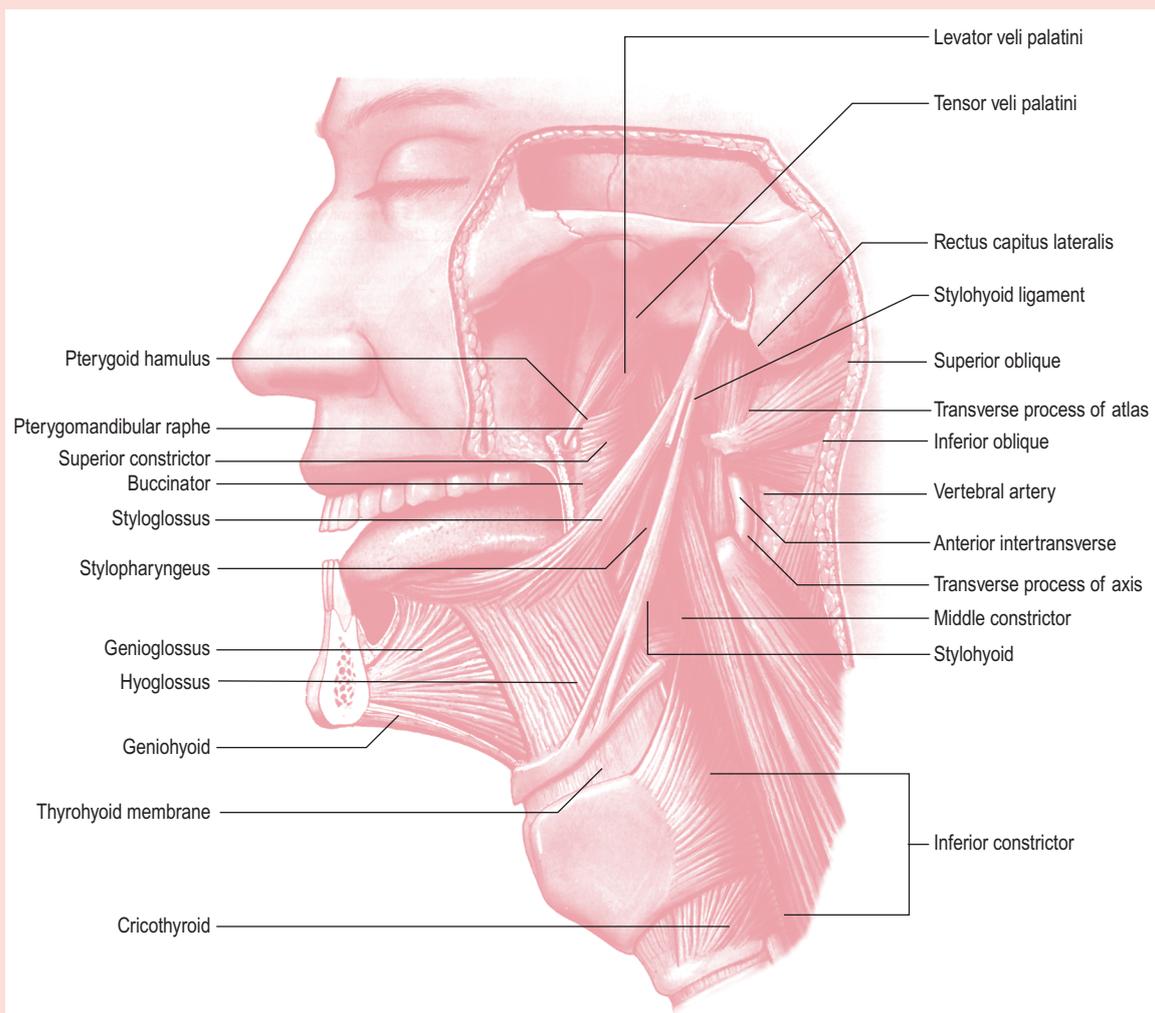
Box A1.1 Soft tissue treatment of mimetic, palatine and tongue muscles—continued

Figure A1.2 Muscles of the tongue, soft palate and styloid process (from *Gray's Anatomy* 1995, with permission).

out to the lateral one-third of the soft palate. A back and forth medial/lateral movement of the finger, or static pressure, is applied into the lateral third of the soft palate, while pressing through the superficial tissues of the soft palate and onto the palatini muscles.

Muscles of the tongue (see Fig. A1.2)

Extrinsic tongue muscles arise from outside the tongue to act upon it, while intrinsic muscles arise wholly within

it and have the primary task of changing the shape of the main body of the tongue (Leonhardt 1986).

The tongue muscles are innervated by the hypoglossal nerve (cranial nerve XII).

Extrinsic muscles of the tongue include the following.

- Hyoglossus, attaches the side of the tongue to the hyoid bone below, by vertical fibers which serve to depress the tongue.
- Genioglossus, runs from the geniotubercle (cephalad from geniohyoid) fanning posteriorly and upwardly to

Box A1.1 Soft tissue treatment of mimetic, palatine and tongue muscles—continued

attach to the hyoid bone, blending with the middle pharyngeal constrictor, attaching to the hyoglossal membrane and the whole length of the ventral surface of the tongue, from root to apex, intermingling with the intrinsic lingual muscles. It pulls the tongue forward to protrude its tip from the mouth.

- Styloglossus, anchors the tongue to the styloid process, near its tip, and to the styloid end of the stylomandibular ligament. Its fibers divide into a longitudinal portion, which merges with the inferior longitudinal muscle, and an oblique portion, which overlaps and crosses hyoglossus to decussate with it. It draws the tongue posteriorly and upwardly.
- Chondroglossus, ascends from the hyoid bone to merge with the intrinsic musculature between the hyoglossus and genioglossus, assisting the hyoglossus in depressing the tongue.
- Palatoglossus, extends from the soft palate to the side of the tongue and the dorsal surface and merges with the transverse lingual muscle. It elevates the root of the tongue while approximating the palatoglossal arch, so closing the oral cavity from the oropharynx.

Intrinsic muscles of the tongue include the following.

- Superior longitudinal, bilaterally extends from submucous tissue near the epiglottis, and from the median lingual septum, to the lingual margins and apex of the tongue. It shortens the tongue and turns the tip and sides upward to make the dorsum concave.
- Inferior longitudinal, extends from the lingual root and the hyoid bone to the tip of the tongue, blending with styloglossus. It shortens the tongue and turns the tip and sides downward to make the dorsum convex.
- Transverse lingual, extends from the median fibrous septum to the submucous fibrous tissue at the tongue's lingual margin. It narrows and elongates the tongue.

- Vertical lingual extends from the dorsal to the ventral aspects in the borders of the anterior tongue. It makes the tongue flatter and wider.

The tongue muscles can act alone or in pairs, and in endless combination. They provide the tongue with precise movements and tremendous mobility, which impacts not only the acts of chewing and swallowing but also speech.

Myofascial tissues are known to produce trigger points and trigger points are known to produce patterns of referral as well as to encourage dysfunction of coordinated movement of the muscles in which they are housed (Simons et al 1998). The tongue muscles might also contain trigger points that produce pain in surrounding tissues, as well as being involved in dysfunctional responses which interfere with swallowing or normal speech patterns. The tongue should be examined and, if necessary, treated in these conditions as well as in those involving voice dysfunction, elevated hyoid bone or sore throat.

NMT for muscles of the tongue The tongue muscles are most easily addressed by reaching across the body to the opposite side of the tongue. The practitioner's gloved index finger is placed on the lateral surface, as far posteriorly as possible. The finger curls into a 'C' shape as it is slid forward the full length of the tongue. The curling action of the finger sinks it into the side of the tongue and penetrates the musculature more effectively than attempting to slide a straight finger.

The gliding, curling movement is repeated a number of times. The finger is moved caudally at fingertip widths and the process repeated as far caudally as possible. Special attention should be given to the most caudal, most posterolateral aspect of the tongue, where the long gliding strokes, previously applied, may become shorter and more precisely applied or static pressure may be used.

The tongue may also be gently tractioned forward and the muscles stretched by grasping it firmly through a clean cloth. This stretch can be held for 30–60 seconds and the direction of tension changed by pulling the tongue to one side or the other.

sudden release, or application, of force, that might potentially irritate the tissues and produce pain or provoke a defensive response.

- Lief's basic spinal treatment followed a set pattern, part of which is set out in Figures 9.10

and 9.11 (p. 267). The fact that the same pattern is recommended to be followed at each treatment does not mean that the treatment is necessarily the same – far from it. The pattern provides a framework, a useful starting and

ending point, but the degree of pressure (and time) applied to the various areas of dysfunction revealed varies, based always on what information the palpating contacts are picking up and the objectives required by the situation. This is what makes each treatment different, despite a similar grid being used to comb the tissues in each case.

- The areas of dysfunction should be recorded on a case card together with all relevant information including diagnostic findings relating to myofascial tissue changes, trigger points and reference zones, areas of sensitivity, restricted motion and so on.

What is working when the thumb applies NMT?

Consider which parts of the practitioner's body/arm/hand will be involved with the various aspects of the glide/stroke as delivered by the thumb (finger strokes involve completely different mechanics).

- The transverse movement of the thumb is a hand or forearm effort.
- The relative straightness or rigidity of the last two thumb segments is also a local muscular responsibility.
- The vast majority of the energy imparted via the thumb results from transmission of body weight through the straight arm into the thumb.
- Any increase in pressure can be speedily achieved by simple weight transfer, from back towards front foot, together with a slight 'lean' onto the thumb from the shoulders.
- A lessening of imparted pressure is achieved by reversing this body movement.

(See Chapter 9, Lief's NMT application to the cranial base area, p. 316, for a detailed description of individual strokes by the thumb through these tissues. See Figure 9.59A–E.)

MUSCLE ENERGY TECHNIQUE: SUMMARY OF VARIATIONS

(DiGiovanna 1991, Greenman 1989, Janda 1989, Lewit 1986, Liebenson 1990, Mitchell 1967, Travell & Simons 1992)

1. Isometric contraction – using reciprocal inhibition (RI)

Indications

- Relaxing muscular spasm or contraction
- Mobilizing restricted joints
- Preparing joint for manipulation.

Contraction starting point For acute muscle or any joint problem, commence just short of, or at, the 'easy' restriction barrier.

Modus operandi An isometric contraction is introduced involving the antagonists to affected muscle(s), so obliging shortened muscles to relax via reciprocal inhibition. The patient is attempting to push through the barrier of restriction against the practitioner's precisely matched counterforce.

Forces The practitioner's and patient's forces are matched. Initial effort involves approximately 20% of the patient's strength with an increase to no more than 30–40% on subsequent contractions. Increasing the duration of the contraction (up to 15 seconds) may be more effective than any increase in force.

Duration of contraction Initially 7–10 seconds, increasing to up to 15 seconds in subsequent contractions, if greater effect required.

Action following contraction Area (muscle/joint) is taken to its new restriction barrier without stretch after ensuring complete relaxation. Perform movement to new barrier on an exhalation.

Repetitions Repeat two to three times or until no further gain in range of motion is possible. No stretching is introduced where tissues are acutely sensitive or have been recently traumatized (3 weeks or so).

2. Isometric contraction – using postisometric (PIR) relaxation (without stretching)

Note: This approach is ideal for acute settings, involving recent trauma or severe pain.

Indications

- Relaxing muscular spasm or contraction
- Mobilizing restricted joints
- Preparing joint for manipulation.

Contraction starting point At or just short of resistance barrier.

Modus operandi The affected muscles (agonists) are used in the isometric contraction, therefore the shortened muscles subsequently relax via post-isometric relaxation. The practitioner is attempting to push through the barrier of restriction against the patient's precisely matched countereffort.

Forces The practitioner's and patient's forces are matched. Initial effort involves approximately 15–20% of the patient's strength, increasing to no more than 30–40% on subsequent contractions. Increase of the duration of the contraction (up to 15 seconds) may be more effective than any increase in force.

Duration of contraction Initially 7–10 seconds, increasing to up to 15 seconds in subsequent contractions, if greater effect required.

Action following contraction Area (muscle/joint) is taken to its new restriction barrier without stretch after ensuring that the patient has completely relaxed. Perform movement to new barrier on an exhalation.

Repetitions Repeat three to five times or until no further gain in range of motion is possible. Hold stretches for not less than 30 seconds.

3. Isometric contraction – using postisometric relaxation (with stretching, also known as postfacilitation stretching)

Note: This approach is ideal for chronic settings.

Indications Stretching restricted, fibrotic, contracted, soft tissues (fascia, muscle).

Contraction starting point Short of resistance barrier, in mid-range.

Modus operandi Affected muscles (agonists) are used in the isometric contraction, therefore the shortened muscles subsequently relax via post-isometric relaxation (PIR), allowing an easier stretch to be performed. The practitioner is attempting to push through the barrier of restriction against the patient's precisely matched countereffort.

Forces The practitioner's and patient's forces are matched. Initial effort involves approximately 30% of the patient's strength; an increase to no more than 40–50% on subsequent contractions is appropriate. Increase of the duration of the contraction – up to 15 seconds – may be more effective than any increase in force.

Duration of contraction Initially 7–10 seconds, increasing to up to 20 seconds in subsequent contractions, if greater effect required.

Action following contraction Rest period of 5–10 seconds to ensure complete relaxation before stretch is useful. On an exhalation, the area (muscle) is taken to its new restriction barrier and a small degree beyond, painlessly, and held in this position for at least 10 seconds. The patient should, if possible, help to move to and through the barrier, effectively further inhibiting the structure being stretched and retarding the likelihood of a myotatic stretch reflex occurring.

Repetitions Repeat three to five times or until no further gain in range of motion is possible. Hold stretches for not less than 30 seconds.

4. Isotonic concentric contraction

Indications Toning weakened musculature.

Contraction starting point In a mid-range easy position.

Modus operandi The contracting muscle is allowed to do so, with some (constant) resistance from the practitioner.

Forces The patient's effort overcomes that of the practitioner, since the patient's force is greater than practitioner resistance. The patient uses maximal effort available but force is built slowly not via sudden effort. The practitioner maintains a constant degree of resistance.

Duration 3–4 seconds.

Repetitions Repeat five to seven times or more if appropriate.

5. Rapid isotonic eccentric contraction (isolytic)

Indications Stretching tight fibrotic musculature.

Contraction starting point A little short of restriction barrier.

Modus operandi The muscle to be stretched is contracted and is prevented from doing so by superior practitioner effort, so that the contraction is overcome and reversed and the contracting muscle is stretched. Origin and insertion do not approximate. Muscle is stretched to, or as close as possible to, full physiological resting length.

Forces The practitioner's force is greater than the patient's. Less than maximal patient's force is employed at first. Subsequent contractions build towards this, if discomfort is not excessive.

Duration of contraction 2–4 seconds.

Repetitions Repeat two to three times if discomfort is not excessive.



CAUTION

Avoid using isolytic contractions on head/neck muscles or at all if patient is frail, very pain sensitive or osteoporotic. Isolytic contractions of this sort (rapid isotonic eccentric stretch) create microtrauma and will result in soreness for several days.

6. Slow eccentric isotonic contraction (SEIC)

Indications Toning inhibited antagonists while preparing agonists for subsequent stretching

Contraction starting point At restriction barrier.

Modus operandi The muscle to be stretched at the end of the procedure is taken to its comfortable end of range and actively held there by the patient's effort. The practitioner uses superior effort to *slowly* overcome this attempt to remain at the barrier and returns the structure

(e.g. arm, leg, etc.) to its neutral position. This effectively tones the muscles that are being slowly stretched, while inhibiting their short/tight antagonists. The short/tight structures can then be stretched as in the example of RI and PIR given above (methods 2 and 3).

Forces The practitioner's force is greater than the patient's. Less than maximal patient's force is employed at first. Subsequent contractions build towards this, if discomfort is not excessive, and if the practitioner can overcome the resistance in a controlled manner (i.e. no jerking or undue effort on either part).

Duration of contraction 5–10 seconds.

Repetitions Repeat two to three times for best results. Hold stretches for not less than 30 seconds.

7. Isokinetic (combined isotonic and isometric contractions)

Indications

- Toning weakened musculature
- Building strength in all muscles involved in particular joint function
- Training and balancing effect on muscle fibers.

Starting point of contraction Easy mid-range position.

Modus operandi The patient resists with moderate and variable effort at first, progressing to maximal effort subsequently, as the practitioner puts joint rapidly through as full a range of movements as possible. This approach differs from a simple isotonic exercise as whole ranges of motion rather than single motions are involved and because resistance varies, progressively increasing as the procedure progresses.

Forces The practitioner's force overcomes the patient's effort to prevent movement. First movements (taking an ankle, say, into all its directions of motion) involve moderate force, progressing to full force subsequently. An alternative is to have the practitioner (or machine) resist the patient's effort to make all the movements.

Duration of contraction Up to 4 seconds.

Repetitions Repeat two to four times.

Important notes on assessments and use of MET

1. When the term 'restriction barrier' is used in relation to soft tissue structures it is meant to indicate the first signs of resistance (as palpated by sense of 'bind' or sense of effort required to move the area or by visual or other palpable evidence), not the greatest possible range of movement available.
2. The shorthand reference of 'acute' and 'chronic' is commonly used to alert the reader to the variations in methodology which these variants call for, especially in terms of the starting position for contractions (acute – and all MET joint treatment – starts at the barrier, chronic short of the barrier) and the need to take the area to (acute) or through (chronic) the resistance barrier subsequent to the contraction.
3. Assistance from the patient is valuable as movement is made to or through a barrier, providing the patient can be educated to gentle co-operation and not to use excessive effort.
4. In most MET treatment guidelines the method described involves isometric contraction of the agonist(s), the muscle(s) which require stretching. There also exists the possibility of using the antagonists to achieve reciprocal inhibition (RI) before initiating stretch or movement to a new barrier, an approach suggested if there is pain on use of agonist or if prior trauma to the agonist has occurred.
5. There should be no pain experienced during application of MET although mild discomfort (stretching) is acceptable.
6. The methods recommended provide a sound basis for the application of MET to specific muscles and areas. By developing the skills with which to apply the methods, as described, a repertoire of techniques can be acquired offering a wide base of choices appropriate in numerous clinical settings.
7. Breathing co-operation can and should be used as part of the methodology of MET. Basically, if appropriate (the patient is co-operative and capable of following instructions), the patient

should inhale as they slowly build up an isometric contraction, hold the breath for the 7–10 second contraction and release the breath on slowly ceasing the contraction; they should be asked to inhale and exhale fully once more following cessation of all effort as they are instructed to 'let go completely'. During this last exhalation the new barrier is engaged or the barrier is passed as the muscle is stretched. A note to 'use appropriate breathing', or some variation on it, will be found in the text describing various MET applications.

8. Various eye movements are sometimes advocated during contractions and stretches.
9. There are times when 'co-contraction' is useful, involving contraction of both the agonist and the antagonist. Studies have shown that this approach is particularly useful in treatment of the hamstrings, when both these and the quadriceps are isometrically contracted prior to stretch (Moore et al 1980).

POSITIONAL RELEASE TECHNIQUES (PRT) (INCLUDING STRAIN/COUNTERSTRAIN) (Chaitow 2002)

There are many different methods involving the positioning of an area, or the whole body, in such a way as to evoke a physiological response which helps to resolve musculoskeletal dysfunction. The means whereby the beneficial changes occur seem to involve a combination of neurological and circulatory changes which occur when a distressed area is placed in its most comfortable, its most 'easy', most pain-free position. The impetus towards the use of this most basic of treatment methods in a coherent rather than a hit-and-miss manner lies in the work of Laurence Jones, who developed an approach to somatic dysfunction which he termed 'strain and counterstrain' (SCS) (Jones 1981). Walther (1988) describes the moment of discovery in these words.

Jones's initial observation of the efficacy of counterstrain was with a patient who was unresponsive to treatment. The patient had been unable to sleep because of pain. Jones attempted

to find a comfortable position for the patient to aid him in sleeping. After twenty minutes of trial and error, a position was finally achieved in which the patient's pain was relieved. Leaving the patient in this position for a short time, Jones was astonished when the patient came out of the position and was able to stand comfortably erect. The relief of pain was lasting and the patient made an uneventful recovery.

The position of 'ease' which Jones found for this patient was an exaggeration of the position in which spasm was holding him, which provided Jones with an insight into the mechanisms involved. Since Jones first made his valuable observation that a position which exaggerated a patient's distortion could allow a release of spasm and hypertonicity, many variations on this basic theme have emerged, some building logically on that first insight with others moving in new directions.

Common basis

The commonality of all of these approaches is that they move the patient or the affected tissues away from any resistance barriers and towards positions of comfort. The shorthand terms used for these two extremes are 'bind' and 'ease', terms which anyone who has handled the human body will recognize as being extremely apt.

The need for the many variations to be understood should be obvious. Different clinical settings require that a variety of therapeutic approaches be available. Jones's approach requires verbal feedback from the patient as to the degree of discomfort in a 'tender' point being used as a monitor by the practitioner who is palpating/compressing it, as an attempt is made to find a position of ease.

One can imagine a situation in which the use of Jones's 'tender points as a monitor' method would be inappropriate (loss of the ability to communicate verbally or someone too young to report levels of discomfort). In such cases there is a need for a method that allows achievement of the same ends, without verbal communication. This is possible using either 'functional' approaches or 'facilitated positional release' methods, involving finding a position of maximum ease by means of palpation alone, assessing for a state of 'ease' in the tissues.

As we examine a number of the variations on the theme of PRT, release by placing the patient, or area, into 'ease', the variety of clinical and therapeutic potentials for the use of this approach will become clearer.

It is important to note that if positional release methods are being applied to chronically fibrosed tissues, a reduction in hypertonicity may result, but a reduction in fibrosis is not possible. Pain relief or improved mobility might therefore be only temporary in such cases.

1. Exaggeration of distortion (an element of SCS methodology)

Consider the example of an individual bent forward in psoas spasm/'lumbago'. The patient is in considerable discomfort or pain, posturally distorted into flexion together with rotation and sidebending.

Any attempt to straighten towards a more physiologically normal posture would be met by increased pain. Engaging the barrier of resistance would therefore not be an ideal first option.

However, moving the area away from the restriction barrier would not usually be a problem for such an individual. The position required to find 'ease' for someone in this state normally involves painlessly increasing the degree of distortion displayed, placing the person (in the case of the example given) into some variation based on forward bending, until pain is found to reduce or resolve. After 60–90 seconds in this *position of ease*, a slow return to neutral would be carried out and commonly, in practice, the patient will be somewhat, or completely, relieved of pain and spasm.

2. Replication of position of strain (an element of SCS methodology)

Take the example of someone who is bending to lift a load when an emergency stabilization is required and strain results (the person slips or the load shifts, perhaps). The patient could be locked into the same position of 'lumbago-like' distortion as in example 1, above.

If, as SCS suggests, the position of ease equals the position of strain, then the patient needs to be taken back into flexion, in slow motion, until tenderness vanishes from the

monitored tender point and/or a sense of 'ease' is perceived in the previously hypertonic, shortened tissues. Adding small 'fine-tuning' positioning to the initial position of ease, achieved by flexion, usually results in a maximum reduction in pain. This position is held for 60–90 seconds before a slow return to neutral is allowed, at which time, as in example 1, a partial or total resolution of hypertonicity, spasm and pain should be experienced. The position in which the strain took place is likely to be similar to the position of exaggeration of distortion, as in example 1.

These two elements of SCS are of limited clinical value and are described as examples only, since it is not every patient who can describe precisely in which way their symptoms developed. Nor is obvious spasm, such as torticollis or acute anteflexion spasm ('lumbago'), the norm. Ways other than 'exaggeration of distortion' or 'replication of position of strain' are therefore needed in order to be able to identify probable positions of ease.

3. Using Jones's tender points as monitors (D'Ambrogio & Roth 1997, Jones 1981)

Over many years of clinical experience Jones compiled lists of specific tender point areas, relating to every imaginable strain, of most of the joints and muscles of the body. These are his 'proven' (by clinical experience) points. Tender points are usually found in tissues which were in a shortened state at the time of strain, rather than those which were stretched. Tender points, other than those identified by Jones and his colleagues, are periodically reported on in the osteopathic literature – for example, sacral foramen points relating to sacroiliac strains (Ramirez et al 1989).

Jones and his followers provided strict guidelines for achieving ease in any tender points which are being palpated. The position of ease usually involving a 'folding' or crowding of the tissues in which the tender point lies. This method involves maintaining pressure on the monitored tender point, or periodically probing it, as a position is achieved in which:

- there is no additional pain in whatever area is symptomatic
- pain in the monitored point has reduced by at least 75%.

The position of ease is held for an appropriate length of time (90 seconds according to Jones; however, there are variations suggested for the length of time required in the position of ease, as will be explained).

In the example of the person with acute low back pain who is locked in flexion, the tender point will be located on the anterior surface of the abdomen, in the muscle structures which were shortened at the time of strain (when the patient was in flexion). The position that removes tenderness from this point will usually require flexion and probably some fine-tuning involving rotation and/or sidebending.

If there is a problem with Jones's formulaic approach it is that, while he is frequently correct as to the position of ease recommended for particular points, the mechanics of the particular strain with which the practitioner is confronted may not coincide with Jones's guidelines. Any practitioner who relies solely on Jones's 'menus', or formulae, could find it difficult to handle a situation in which the prescription failed to produce the desired results. Reliance on Jones's menu of points and positions can therefore lead to the practitioner becoming dependent on them and it is suggested that development of palpation skills, and other variations of Jones's original observations, offers a more rounded approach for dealing with strain and pain.

Fortunately Goodheart (and others) has offered less rigid frameworks for using positional release.

4. Goodheart's approach (Goodheart 1984, Walther 1988)

George Goodheart (the developer of 'applied kinesiology' – see Chapter 5) has described an almost universally applicable formula which relies more on the individual features displayed by the patient and less on rigid formulae, as used in Jones's approach.

Goodheart suggests that a suitable tender point be sought in the tissues opposite those 'working' (active) when pain or restriction is

noted. If pain/restriction is reported/apparent on any given movement, muscles antagonistic to those operating at the time pain is noted will be those housing the tender point(s). Thus, for example, pain (wherever it is felt) which occurs when the neck is being turned to the left will indicate a tender point located in the muscles that turn the head to the right.

In examples 1 and 2, of a person locked in forward bending with acute pain and spasm, if Goodheart's approach is applied, pain and restriction would be experienced as the person straightened up (moved into extension) from their position of enforced flexion.

This action (straightening up) would usually cause pain in the back but, irrespective of where the pain is noted, a tender point would be sought (and subsequently treated by being taken to a state of ease as in the Strain/counterstrain described above) in the muscles antagonistic to those working when pain was experienced – i.e. it would lie in the flexor muscles (possibly psoas) in this example.

Note It is important to emphasize this factor, that tender points which are intended to be used as 'monitors' during the positioning phase are not sought in the muscles antagonistic to those where pain is noted, but in the muscles that antagonize those which are actively moving the patient, or area, when pain or restriction is noted.

5. Functional technique (Bowles 1981, Hoover 1969) Osteopathic functional technique relies on a reduction in palpated tone in stressed (hypertonic/spasm) tissues as the body (or part) is being positioned, or fine-tuned, in relation to all available directions of movement, in a given region. One hand palpates the affected tissues (molded to them, without invasive pressure). This is described as the 'listening' hand, since it assesses changes in tone as the practitioner's other hand guides the patient, or part, through a sequence of positions which are aimed at enhancing 'ease' and reducing 'bind'.

A sequence is carried out involving different directions of movement (e.g. flexion/extension, rotation right and left, sidebending right and left, etc.) with each movement starting at the point of maximum ease, as revealed by the

previous evaluation, or combined point of ease following a number of previous evaluations. In this way one position of ease is 'stacked' on another, until all movements have been assessed for ease.

Were the same fictional patient with the low back problem, as previously discussed, being treated using functional technique, the tense tissues in the low back would be the ones being palpated. Following a sequence involving flexion/extension, sidebending and rotating in each direction, translation right and left, translation anterior and posterior and compression/distraction – so involving all available directions of movement of the area – a position of maximum ease would be achieved after which (if the position were held for 30–90 seconds) a release of hypertonicity and reduction in pain should result.

The precise sequence in which the various directions of movement are evaluated seems to be irrelevant, as long as all possibilities are included.

Theoretically (and often in practice) the position of palpated maximum ease (reduced tone) in the distressed tissues should correspond with the position which would have been found were pain being used as a guide, as in either Jones's or Goodheart's approach, or using the more basic 'exaggeration of distortion' or 'replication of position of strain' formulae.

6. Any painful point as a starting place for SCS (McPartland & Zigler 1993) All areas which palpate as painful are responding to, or are associated with, some degree of imbalance, dysfunction, sensitization or reflexive activity, which may involve acute or chronic strain. Jones identified the probable positions of tender points relating to particular strain positions. It makes just as much sense to work the other way around, by identifying the strain pattern associated with any identified pain point. It is useful to consider that any painful point/area located during soft tissue evaluation can be treated by positional release, whether the strain that produced the dysfunction is known or not and whether the problem is acute or chronic.

This approach, of being able to treat any painful tissue using positional release, is valid whether the pain is being monitored via verbal feedback from the patient (using reducing levels of pain in the palpated point as a guide) or a functional approach is adopted, assessing for maximal reduction in tone in the tissues. The recommended time for holding the position of maximum ease is 60–90 seconds.

Experience, and simple logic, suggest that the response to positional release of a chronically fibrosed area will be less dramatic than from tissues held in simple spasm or hypertonicity. Nevertheless, even in chronic settings, a degree of 'release' can be anticipated, allowing for easier access to the deeper fibrosis.

7. Integrated neuromuscular inhibition technique (INIT) (Chaitow 1994) INIT involves using the position of ease as part of a sequence which commences with the location of a tender/pain/trigger point, followed by application of ischemic compression (optional – avoided if pain is too intense or the patient too sensitive) followed by the introduction of positional release. After an appropriate length of time, during which the tissues are held in 'ease', the patient introduces an isometric contraction into the affected tissues for 7–10 seconds, after which these are stretched to attempt to restore normal resting length to the tissues.

Method A trigger point should initially be treated by direct inhibitory ('ischemic') pressure (sustained or intermittent) until a change in perceived pain is reported.

Pressure is continued as the tissues in which the trigger point lies are positioned in such a way as to reduce the pain (entirely or at least by approximately 70%). When this has been achieved the most (dis)stressed fibers surrounding the trigger point will have been placed into a position of ease.

Following a period of 20–30 seconds of this position of ease and inhibitory pressure (constant or intermittent), the patient should be asked to introduce an isometric contraction into these tissues and to hold this for 7–10 seconds, involving the precise fibers which had been repositioned to obtain the positional release.

The effect of this would be to produce (following the contraction) a reduction in tone in these tissues. The hypertonic or fibrotic tissues should then be gently stretched, as in any muscle energy procedure, so that the specifically targeted fibers are lengthened.

SCS rules of treatment

The following 'rules' are based on clinical experience and should be borne in mind when using positional release methods (SCS, etc.) in treating pain and dysfunction, especially where the patient is fatigued, sensitive and/or distressed (McPartland & Zigler 1993).

- Never treat more than five 'tender' points at any one session and treat fewer than this in sensitive individuals.
- Forewarn patients that, just as in any other form of bodywork which produces altered function, a period of physiological adaptation is inevitable and that there will therefore be a 'reaction' on the day(s) following even this extremely light form of treatment. Soreness and stiffness are therefore to be anticipated.
- If there are multiple tender points – as is inevitable in fibromyalgia – select those most proximal and most medial for primary attention; that is, those closest to the head and the center of the body rather than distal and lateral pain points.
- Of these tender points, select those that are most painful for initial attention/treatment.
- If self-treatment of painful and restricted areas is advised – and it should be if at all possible – apprise the patient of these rules (i.e. only a few pain points on any day to be given attention, to expect a 'reaction', to select the most painful points and those closest to the head and the center of the body).

The guidelines which should therefore be remembered and applied are:

- locate and palpate the appropriate tender point or area of hypertonicity
- use minimal force

- use minimal monitoring pressure
- achieve maximum ease/comfort/relaxation of tissues
- produce no additional pain anywhere else.

These elements need to be kept in mind as positional release/SCS methods are learned and are major points of emphasis in programs which teach it (Jones 1981). The general guidelines which Jones gives for relief of the dysfunction with which such tender points are related involve directing the movement of these tissues towards ease, which commonly involves the following elements.

- For tender points on the anterior surface of the body, flexion, sidebending and rotation should be towards the palpated point, followed by fine-tuning to reduce sensitivity by at least 70%.
- For tender points on the posterior surface of the body, extension, sidebending and rotation should be away from the palpated point, followed by fine-tuning to reduce sensitivity by 70%.
- The closer the tender point is to the midline, the less sidebending and rotation should be required and the further from the midline, the more sidebending and rotation should be required, in order to effect ease and comfort in the tender point (without any additional pain or discomfort being produced anywhere else).
- Sidebending when trying to find a position of ease often needs to be away from the side of the palpated pain point, especially in relation to tender points found on the posterior aspect of the body.

PRT: the cranial dimension

- The treatment of tender points on the cranium has been described in Chapter 10.
- Many cranial methods involve functional technique concepts (e.g. exaggeration of distortion).
- All PRT methods can be safely used on soft tissues attaching to the cranium, even in acute settings.
- Upledger's release of 'energy cysts', as described in Chapter 10 (p. 326), incorporates positional release methods.

- Apparently 'direct' approaches such as the V-spread (see Exercise 7.6, Ch. 7) might actually involve PRT mechanisms, by virtue of a slackening of internal fascial structures (e.g. tentorium cerebelli, falx cerebri) via the sustained light pressure involved.

MYOFASCIAL RELEASE (MFR) TECHNIQUES (Barnes 1996, Shea 1993)

John Barnes writes: 'Studies suggest that fascia, an embryological tissue, reorganizes along the lines of tension imposed on the body, adding support to misalignment and contracting to protect tissues from further trauma' (Twomey & Taylor 1982). Having evaluated where a restriction area exists, MFR technique calls for a sustained pressure (gentle usually) that engages the elastic component of the elastico-collagenous complex, stretching this until it ceases releasing. This barrier is held until release recommences as a result of what is known as the 'viscous flow phenomenon' in which a slowly applied load (pressure) causes the viscous medium to flow to a greater extent than would be allowed by rapidly applied pressure. As fascial tissues distort in response to pressure, the process is known by the short-hand term 'creep'. Hysteresis is the process of heat and energy loss by the tissues as they deform (*Dorlands medical directory* 1985).

Mark Barnes (1997) describes the simplest MFR treatment process as follows.

Myofascial release is a hands-on soft tissue technique that facilitates a stretch into the restricted fascia. A sustained pressure is applied into the tissue barrier; after 90 to 120 seconds the tissue will undergo histological length changes allowing the first release to be felt. The therapist follows the release into a new tissue barrier and holds. After a few releases the tissues will become softer and more pliable.

Shea (1993) explains this phenomenon.

The components of connective tissue (fascia) are long thin flexible filaments of collagen surrounded by ground substance. The ground substance is composed of 30%–40% glycoaminoglycans (GAG) and 60%–70% water. Together GAG and

water form a gel ... which functions as a lubricant as well as to maintain space (critical fiber distance) between collagen fibers. Any dehydration of the ground substance will decrease the free gliding of the collagen fibers. Applying pressure to any crystalline lattice increases its electrical potential, attracting water molecules, thus hydrating the area. This is the piezoelectric effect of manual connective tissue therapy.

By applying direct pressure of the appropriate degree, at the correct angle (angle and force need to be suitable for the particular release required), a slow lengthening of restricted tissue occurs.

A number of different approaches are used in achieving this (note that it bears a strong resemblance, in parts, to the methodology of Lief's NMT as described above).

- A pressure is applied to restricted myofascia using a 'curved' contact and direction of pressure in an attempt to glide, or slide, against the restriction barrier.
- The patient may be asked to assist by means of breathing tactics or moving the area in a way which enhances the release, based on practitioner instructions.
- As softening occurs the direction of pressure is reassessed and gradually applied to move towards a new restriction barrier.

- In using patient assistance single directions and small, slowly applied degrees of effort are called for initially until you are sure of what it is you want of the patient.

MFR technique is used to improve movement potentials, reduce restrictions, release spasm, ease pain and to restore normal function to previously dysfunctional tissues.

CONCLUSION

The range of soft tissue methods available to treat soft tissue dysfunction associated with the cranium is no less varied than for other parts of the body. This chapter has attempted to provide a basic introduction to some of the most widely used methods and their rationale. There are other soft tissue approaches, as well as numerous other variations deriving from NMT, MET, PRT and MFR, that have not been described. What is of the most importance is that skills be acquired that lie outside basic cranial manipulation methodology, to enable the practitioner to encourage normalization of the soft tissues that attach to the cranium, as part of an integrated and comprehensive approach to treatment.

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