Advanced SCS and functional approaches

4

CHAPTER CONTENTS

This chapter contains details, discussions and outlines of the potential for use of SCS (and other positional release methods) in a variety of different settings and contexts:

- SCS and functional techniques (see Chapter 6) have been shown to offer major benefits for hospital (notably post-surgical) patients (see also details of use of SCS in bed-bound patients in Chapter 3).
- Specific positional release protocols are outlined in relation to post-surgical situations, respiratory dysfunction, temporomandibular joint problems, pregnancy and where there is a need for enhanced lymphatic drainage.
- Some novel approaches, developed by Jones himself, as well as positional release methods deriving from George Goodheart and John Upledger, in relation to cranial treatment, are detailed.
- Goodheart has also described a number of strategies that he believes allow for identification of those muscles that will respond best to positional release methodology, and these are described in this chapter, as is his remarkable 'coccygeal lift' method.
- A specific pelvic approach (inguinal lift), developed by Marsh Morrison is also detailed (see induration technique, also developed by Morrison, in Chapter 1).

Side-effects

(McPartland 1996)

Before describing these advanced SCS approaches it is important to discuss 'side-effects' of manual therapy in general, and positional release in particular, and a particular issue relating to the feedback that some ('stoic') patients offer.

McPartland (1996) notes that between one-quarter and one-third of patients treated by SCS have some reaction, despite the gentleness of these approaches.

Very occasionally there are extensive 'muscle release' reactions. These are usually transitory and seldom last more than a few hours. However, patients should be forewarned of the possibility, to allay anxiety. No treatment is needed for the reaction if it occurs, as it is itself merely evidence of an adaptation process and passes rapidly.

In relation to positional release methods applied to the cranium (see later in this chapter) it is important to highlight a report on iatrogenic effects from inappropriately applied cranial treatment (most of which involves positional release methodology) (McPartland 1996). This report presented nine illustrative cases, of which two involved intra-oral treatment. All cases seemed to involve excessive force being used, and this highlights the need for care and gentleness in all cranially applied treatment, particularly when working inside the mouth.

'Stoic' patients

Since the process of finding a position of ease requires fairly rapid feedback from the patient ('what's the pain score in the tender point now?'), it is unlikely to be useful in patients who say that there is little or no pain (despite evidence to the contrary) and who would therefore have difficulty in reporting any change as positioning and fine-tuning are carried out.

Such patients can be better treated using functional approaches, as described in Chapter 6, in which the practitioner relies on palpated tissue release or a sense of 'ease', rather than on subjective information reported by the patient.

This is also true of patients who are taking pain medication, whose judgement as to the degree of discomfort being experienced is likely to be dulled

The hospitalized patient

SCS has been widely used in hospital settings as an adjunctive treatment for patients with congestive heart failure, respiratory failure, pneumonia, bronchitis and asthma (Dicky 1989, Schwartz 1986, Stiles 1976). A few examples of osteopathic treatment (incorporating SCS and functional approaches) of hospitalized patients are summarized in Box 4.1.

Conditions that call for SCS in hospital settings include acquired positional pain, especially after spinal anesthesia, or after the return to a normal position following a lithotomy position, after perineal surgery.

Schwartz (1986) also suggests that SCS can be used in differential diagnosis in acute pain situations. He gives the example of an acute abdominal pain below

Box 4.1 Three examples of the efficacy of osteopathic methods (including SCS) used in hospital settings

1. Reduced duration of postoperative hospital stay

Osteopathic manipulative treatment (including SCS and functional techniques) is seen to be easily implemented and cost-effective because of the shorter hospital stays resulting from effective relief of acute pain. Patients who receive morphine preoperatively and osteopathic attention postoperatively tend to have less postoperative pain and require less intravenously administered morphine. In addition, those receiving osteopathic attention demonstrate early ambulation and body movement as well as decreased postoperative morbidity and mortality and increased patient satisfaction (Noll et al 2000).

2. Shorter hospital stay for patients with pancreatitis

In an outcomes research study, Radjieski et al (1998) randomly assigned eight patients with pancreatitis to receive standard care plus daily osteopathic manipulative treatment (comprising myofascial release, soft tissue, and SCS techniques) for the duration of their hospitalization, and eight patients to receive only standard care. Osteopathic treatment involved 10 to 20 minutes daily of a standardized protocol, with attending physicians blinded as to group assignment. Results indicated that patients who received osteopathic attention averaged significantly fewer days in the hospital before discharge (mean reduction, 3.5 days) than control subjects, although there were no significant differences in time to food intake or in use of pain medications.

3. Shorter hospitalization and duration of intravenous antibiotics for elderly pneumonia patients

Elderly patients hospitalized with acute pneumonia were recruited and randomly placed into two groups: 28 in the treatment group and 30 in the control group. The treatment group received a standardized osteopathic attention protocol (including SCS and functional methods), while the control group received a light touch protocol. There was no statistical difference between groups for age, sex, or simplified acute physiology scores. The treatment group had a significantly shorter duration of intravenous antibiotic treatment and a shorter hospital stay (Noll et al 2000).

and to the right of the umbilicus. This happens to be close to where pain would be palpated were there a flexion strain of a lower thoracic or upper lumbar vertebrae (see Fig. 3.10A), as well as if there were acute appendicitis. If pain returns rapidly after an SCS application to the point, appendicitis is strongly indicated.

A second example is given of the diagnostic potential of SCS in the case of a differential assessment between myocardial infarction and acute costochondritis. The latter is often rapidly amenable to SCS treatment using a tender point in one of the left costal interspaces, while the myocardial infarction would not respond to such treatment.

Schwartz (1986) suggests that:

> *Literally thousands of hospital days could be saved by judicious osteopathic examination for interspace dysfunction and appropriate counterstrain treatment.*

SCS treatment is noninvasive and is anything but traumatic and can be applied to a patient in almost any degree of ill-health and distress.

Schwartz concludes:

> *It may be used on patients with fractures, as well as on post-surgical patients who have pain at the site of incision. It may also be used on patients who have osseous metastatic disease. If the part of the body that is to be treated can be moved by the patient it can safely be treated with SCS.*

Results are claimed to be lasting and repetitive treatment is needed (in hospital settings) only if there is ongoing neurosensory reflex activity, or if the condition that produced the dysfunction in the first place is repeated or ongoing.

Schwartz's description of the tender point

Schwartz's description of tender points is based directly on Jones's work. The points are used as monitors in SCS application, and are described as being, 'pea-sized bundles or swellings of fascia, muscle tendrils, connective tissue and nerve fibers as well as some vascular elements'.

Interestingly, unlike many other clinicians, Schwartz notes that: 'Generally, but not always, pressure on the tender point will cause pain at a site distant to the point itself'.' That description defines such a point as a trigger point, as well as a tender point (trigger points are discussed in Chapter 5). He acknowledges that 'tender points' resemble both Chapman's neurolymphatic reflexes and Travell's myofascial trigger points (Owens 1982, Travell 1949).

Schwartz highlights the difference between SCS and other methods which use such points in treatment by saying: 'Other methods invade the point itself, for example by needle in acupuncture, injection of lidocaine into the point, or the use of pressure or ultrasound to destroy the tender point.'

When using SCS, if a position of ease is achieved and tenderness vanishes from the palpated point, one of a number of sensations may become apparent to the practitioner, a 'sudden release', or a 'wobble', or a 'give', or a 'melting away', all of which indicate a change in the tissues in response to the positional change that has been brought about by the practitioner.

The two phases of the positioning process are emphasized: 'gross' movement, which takes the area or the patient to the approximate position of ease, and 'fine-tuning', which takes the remainder of the pain from the tender point.

Problems of manual treatment delivery in hospital

Acutely ill patients have very special problems and needs when being considered for manual treatment. These relate to their inability to be moved more than a little, their difficulty in cooperating in a manual treatment because of 'multiple intravenous and subclavian taps, monitors or various types of catheters', as well as their current particular state of vulnerability, either due to illness or to their being pre- or post-surgical (Schwartz 1986).

Edward Stiles, then director of osteopathic medicine at Waterville Osteopathic Hospital in Maine, evaluated the usefulness of osteopathic attention to patients in hospital settings (Stiles 1976). He found that general osteopathic attention is of value in treating pre- and postoperative patients, especially with regard to excursion of the rib cage in order to establish a maximum ventilating ability:

> *This is particularly important for patients undergoing upper gastrointestinal or thoracic surgery, since a decrease in excursion of the rib cage can increase the patient's susceptibility to splinting of the thoracic cage and impede ventilating ability.*

He found that few methods achieved this end more effectively than the application of variants of positional release methods, which are particularly relevant in the context of pain, restriction and limitation of the ability to manipulate the patient's position, as described in Chapter 3 (see notes on bed-bound patients).

Postoperative uses of positional release

Jerry Dickey (1989) has focused attention on the particular needs of the many thousands of people undergoing surgery each year via median sternotomy, in which the rib cage is opened anteriorly to allow access to the heart and other thoracic structures. More than 250 000 patients undergo coronary bypass graft surgery annually (in the USA alone). This surgery is accomplished via a median sternotomy incision, an approach that has been gaining widespread acceptance.

- In this form of surgery an incision is made from the suprasternal notch to below the xiphoid process.
- The soft tissues below the skin are treated with diathermy to stem bleeding and the sternum is divided by an electric bone saw, the exposed edges being covered with bone wax.
- The sternum is then retracted with the upper level being placed at the level of the second rib.
- Following whatever surgical intervention is involved, the sternal margins are brought together and held by stainless steel sutures.
- There are often drainage tubes exiting from below the xiphoid following surgery.

The degree of stress and injury endured by all the tissues of the region is clearly major, especially considering that the open-chest situation may have been maintained for many hours. The sequels to this trauma are many and varied, as Dickey (1989) explains, and include:

> *Dehiscence, substernal and pericardial infection, nonunion of the sternum, pericardial constriction, phrenic nerve injuries, rib fractures and brachial plexus injuries.*

Fully 23.5% of patients undergoing these procedures develop brachial plexus injuries.

Dickey reports on this surgical procedure being carried out experimentally on ten cadavers, of which seven sustained first rib fractures with the fractured ends often impaling the lower trunks of the brachial plexus. While such negative effects are usually noted immediately postoperatively, many problems do not emerge until later, and these might include structural and functional changes in chest mechanics that do not become evident for weeks or months, particularly restrictions affecting thoracic vertebrae and the rib cage, as well as fascial and diaphragmatic changes.

Dickey (1989) has outlined a number of appropriate manual methods for helping in recovery, including positional release methods. He stresses the importance of structural evaluation and treatment, both before and after surgery, with the manual therapeutic methods being of various types. However, it is specifically the positional release approaches that he advocates that are discussed in the context of this book.

Because of the wide retraction involved, the upper ribs (because of their firmer attachments) sustain the greatest degree of strain. Interosseous contraction, fascial strain and diaphragmatic dysfunction may all be palpable and to an extent remediable.

It is as well to be reminded that patients undergoing this form of surgery are likely to be past middle age, commonly with a range of existing musculoskeletal restrictions and dysfunctions, and therefore with a limited prospect of normal function being completely restored (Nicholas & Oleski 2002).

Testing and treating fascial patterns

Commencing around 4 weeks post-surgery, the first step suggested in aiding recovery from this trauma involves a fascial release method.

This is a part of functional technique methodology (see Chapter 6) in which rather than using a 'tender point' monitor, the tissues being treated are evaluated for their directions of freedom of movement (ease), and are held in those directions until a spontaneous change takes place.

- The patient should be supine.
- The practitioner places one hand between the scapulae with the other hand resting on the surface of the midline of the sternum (Fig. 4.1).
- Each hand, independently, tests tissue preference in both a clockwise and then an anticlockwise direction, allowing assessment of the 'tissue preference pattern' relating to the skin and superficial fascia.
- In other words, the hands on the tissues are asking, 'in which direction do these tissues move most easily?', as the anterior and posterior assessments are made.
- Once assessed and identified, the tissues (anterior and posterior simultaneously), are taken in their respective directions of motion, towards the directions of preferred movement that they currently exhibit.
- Whichever direction of rotation is most 'easy' should be held – simultaneously front and back (90 seconds minimum), each in their preferred direction – until tension eases.
- This will commonly release recently acquired stress patterns in the fascia, possibly revealing older patterns which can then be addressed.
- This approach should be applied at least weekly until distorted fascial patterns are resolved or cease to alter, possibly indicating an intractably fixed state.

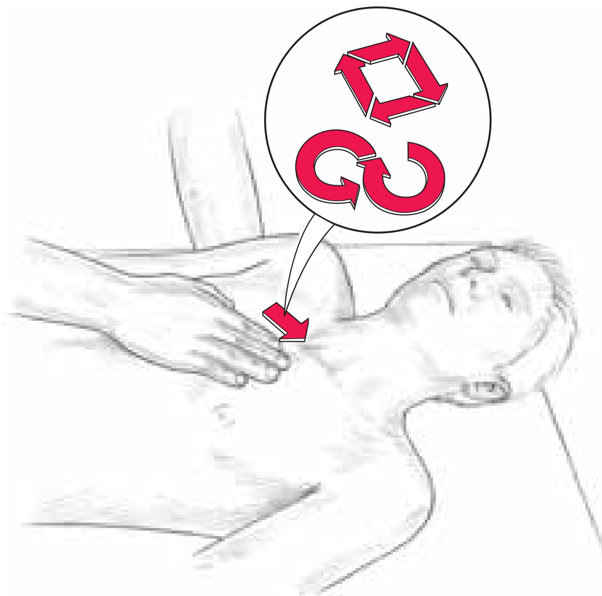

Figure 4.1 Release of traumatized fascial structures. In this figure, the practitioner's left hand lies between the patient's scapulae while the right hand lies on the sternum. The hands independently assess the 'tissue preference patterns' (Dickey 1989). These positions of ease are held in order to allow distorted fascial patterns to modify or normalize. **Note** This procedure is also illustrated in the accompanying CD-ROM with the patient seated, a position that allows greater freedom for the hand on the patient's back.

Normal, unstressed, tissues should exhibit an equal excursion in both directions of rotation, although this is seldom found in adults, even if surgical trauma has not been a factor (Lewit 1999, Zink & Lawson 1979).

SCS for respiratory distress

Schwartz (1986) also notes that SCS, which is the primary manipulative method routinely used in the hospital, is of particular value in mobilization of the mechanical aspects of respiration, including, 'clavicle, ribs, sternum and anterior and posterior vertebral segments, as well as the diaphragm' (see Chapter 3).

Patients due for surgery are routinely treated in order to normalize respiratory function, as well as being treated for postoperative ileus.

Release of the diaphragm can frequently be achieved using a simple functional approach:

Releasing the diaphragm (lower thoracic cage) using PRT

- The patient is supine and the practitioner stands at waist level facing cephalad, and places his hands over the middle and lower thoracic structures, fingers along the rib shafts (Fig. 4.2).
- Treating the structure being palpated as a cylinder, the hands test the preference this cylinder has to rotate around its central axis, one way and then the other: does the lower thorax rotate with more ease to the right or to the left?
- Once the direction of greatest rotational ease has been established, and with the lower thorax rotated into this 'preferred' direction, side-bending one way and then the other is evaluated: when rotation has been made toward ease, does the lower thorax side-flex with more ease to the right or to the left?
- Once these two pieces of information have been established, the combined positions of ease, are 'stacked' onto each other, i.e. the lower thorax is rotated towards its easiest direction, and then side-flexion is introduced, also towards the easiest direction.
- These positions are held for 90 seconds and a slow release is then allowed.
- At this time the diaphragm should be found to function more normally, accompanied by a relaxation of associated soft tissues and a more symmetrical rotation and side-flexion potential of the previously restricted tissues.

Indirect rib treatment

See also SCS rib treatment in Chapter 3.

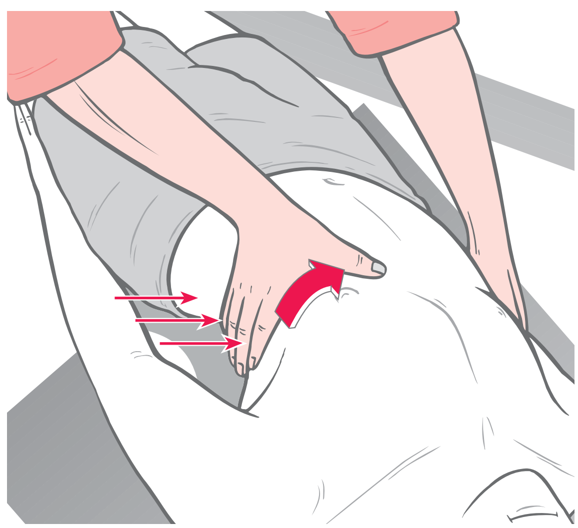

Figure 4.2 General MET for release of lower thorax and diaphragm. (From Chaitow 2001.)

Dickey suggests that following the nonspecific fascial release method described above (see Fig. 4.1), standard rib function tests should be performed in order to identify ribs that are not symmetrical in their range of movement during the respiratory cycle, so that treatment can be introduced in order to assist in normalizing what has become restricted.

In the early postoperative phase, a classical osteopathic positional release approach is suggested (Kimberly 1980).

Method

- The patient sits on one side of a treatment table and the practitioner sits facing the opposite way, on the other side.
- In this way, by half-turning towards the patient, there is easy access to the lateral chest wall.
- Having previously identified ribs that are restricted in their range of motion, using standard assessment procedures (as described in Chapter 3), the practitioner places his hands so that the index and middle fingers of one hand contact the restricted rib to be treated, facing forwards along the anterior aspect of the rib, while the other index and middle finger contact the same rib, facing backwards along the posterior aspect (Figs 4.3A and B).
- The thumbs rest touching each other, tip-to-tip, at the mid-axillary line.
- The patient is asked to sit erect and to lean gently towards the practitioner, so that the ribs and the fingers make good contact.
- In this way no force is exerted by the practitioner towards the ribs, and the patient controls the degree of pressure being applied, which should be just enough to maintain firm contact.
- At this point, the patient is asked to *slightly* and *slowly* rotate the trunk away from the side being treated, which effectively eases the rib away from its demifacets.
- When the practitioner senses that this has been achieved, the patient is instructed to partially inhale and to then exhale in order for an evaluation to be made as to which phase of the cycle induces the greatest sense of *palpable ease*, freedom from tension.

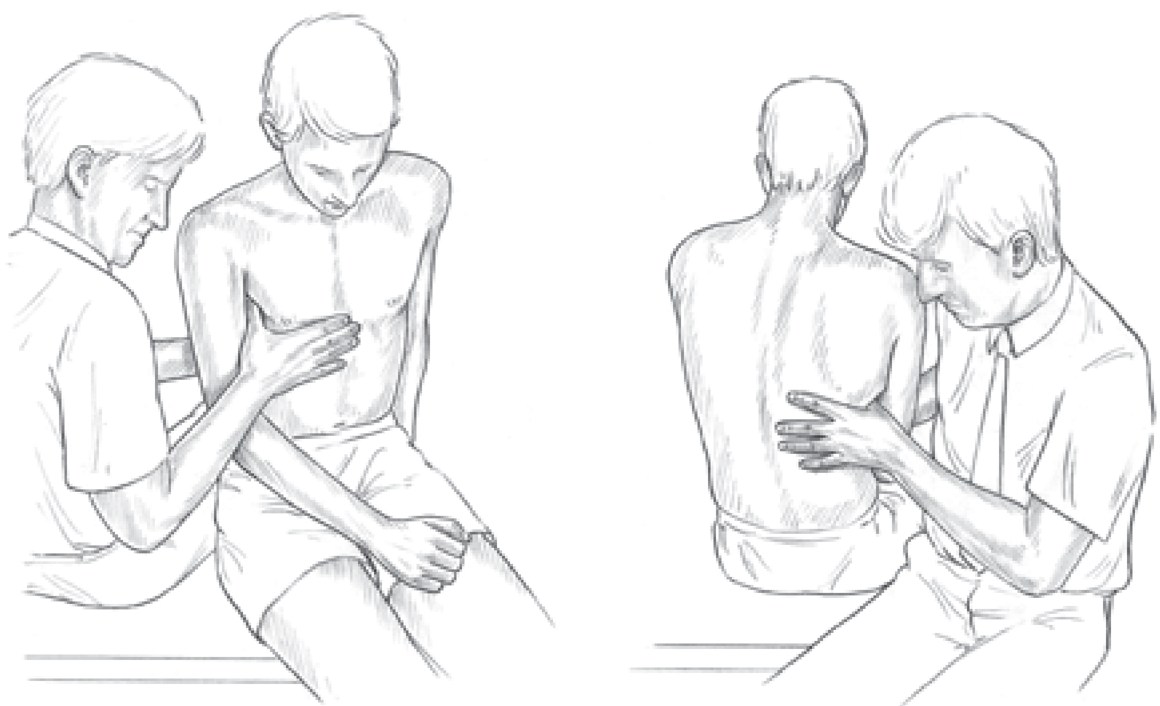

Figure 4.3A and B The practitioner achieves firm but gentle contact of a previously identified dysfunctional rib (elevated, depressed, restricted). The patient controls the degree of hand pressure by leaning towards the practitioner and then slightly turning towards the side opposite that being treated, which releases the demifacets. The patient then inhales and exhales as the practitioner assesses the phase at which the rib is most at ease. The patient holds this phase for as long as is comfortable, one or more times, until improved function is noted (Dickey 1989, Kimberly 1980).

- This evaluation is communicated to the patient, who is asked to hold the breath in the phase that induces maximum ease, for as long as is comfortable.
- The practitioner should be maintaining contact on the rib in order to achieve the maximal degree of ease.
- Any sense that tension, 'bind', is returning calls for a slight modification (fine-tuning) in the direction in which the rib is being held.

The patient may need to repeat the breathing phase several times in order to achieve freedom of motion for a restricted rib at any treatment session, which should be repeated not less than weekly until the ribs have all been released to the degree that is possible.

SCS techniques for rib dysfunction correction outlined in Chapter 3 can also be employed in order to support this method.

Improving lymphatic drainage

In patients who have undergone surgery, there may well be lymphatic stasis, as evidenced by swelling/edema in the region of the posterior axillary fold.

Dickey (1989) suggests that the practitioner should: 'Assess the tissue preference patterns of the upper arm and the forearm, independently'. Once established, both sites should be taken towards the direction of the tissue preference, 'with slight compression through the elbow and the shoulder until he or she perceives the tension relaxing'. This approach is repeated at each visit until tissue drainage is normal.

It is not difficult to see the similarities between the postoperative methods suggested by Dickey and the concepts of SCS and functional technique as described elsewhere in the book (see in particular the various aspects of the Spencer sequence as described in Chapter 3, and also Hoover's clavicle and thoracic exercises in Chapter 6).

The commonality is the sensing of directions of ease in tissues, along with a supportive, noninvasive holding of the tissues in that state until resolution occurs, whether the structures being treated are osseous (ribs, shoulder joint, clavicle) or soft (fascia, muscle).

Unlike SCS, these methods do not involve the use of pain-monitoring points, with the position of maximal ease being achieved entirely by means of palpation assessment.

Positional release in pregnancy

Stiles (1976) has discussed the value of positional release methods in treating a wide range of problems arising in hospitalized patients, including those who are pregnant. Pregnant patients commonly complain of pain in the back and/or legs. This usually can be relieved by osteopathic care, particularly functional techniques (see Chapter 6 for details of treatment of somatic dysfunction in the lumbar area, sacrum, pelvis, and lower extremities). Functional techniques also allow for continued manipulative care right up to the time of delivery.

SCS methods in bed-bound hospital patients

The potential value and importance of methods that are noninvasive and easily adapted to bedridden patients, or those in considerable pain or distress, speaks for itself.

The methods themselves are outlined by osteopathic physician Harold Schwartz, who for many years applied SCS methods to a severely ill, bed-bound population in hospital settings. This involved patients in medical and surgical, obstetric and pediatric wards, including pre- and post-surgical patients, some of whom had undergone cystotomy, gastrotomy and other major surgery.

Schwartz (1986) confirms Jones's assertion that all counterstrain positions are capable of being modified and successfully applied to bed-bound patients, saying that, 'without exception, this observation has been found to be valid'. (See Chapter 3 for suggested positions for bed-bound patients.)

Goodheart's positional release innovations

George Goodheart, the main developer of applied kinesiology, has adapted many aspects of Jones's original work in ways that make it more accessible, reducing the need for the constant reference to, or memorizing of, lists and illustrations of the positions of hundreds of specifically sited tender points that Jones described in his years of research (and as used in Chapter 3).

As briefly outlined in Chapter 1, Goodheart (1984) suggests that:

- A suitable tender point should be sought in muscles antagonistic to those that are active when pain or restriction is observed or reported.
- In such circumstances, the antagonist muscles to those operating at the time pain is noted (or restriction observed or palpated) will be those that house the tender point(s), and these are identified by palpation.
- Another way of understanding this concept is to consider that tender points will usually be found in tissues that have shortened.

Examples:

- If turning the head to the right is either painful or restricted, the muscles that produce that action would be those on the right of the neck, as well as the left sternocleidomastoid muscle.
- Restriction in rotation to the right might well relate to shortening (or dysfunction) involving the muscles on the left.
- According to Goodheart's guidelines ('*seek tender points in antagonist muscle to those active when pain or restriction is noted*'), it is in these shortened structures that a tender point can be found, and used as a monitor during SCS positioning.
- Palpation for suitable tender points should be carried out in the muscles on the left side of the neck, as well as in right side sternomastoid (as this helps to turn the head to the left).
- It is very important to avoid confusion that can occur if a tender point is sought in the tissues *opposite the site of pain on movement*.
- The appropriate tender point will be located in the antagonists to the muscles *active in producing the painful or restricted movement*.
- Once located, the point would be used as a monitor as in all SCS procedures.

Is the muscle weak or strong?

Goodheart suggested a simple test to identify a tender point's usefulness.

- If the muscle containing the tender point tests as weak following a maximal 3-second isometric contraction, after first testing strong, it will benefit from positional release (Walther 1988).
- When a positional release treatment is successful, this same protocol suggests that the muscle will no longer weaken after a short, strong, isometric contraction.

Different focus

Whereas Jones's use of SCS is largely focused towards treatment of painful conditions, Goodheart has focused on improving the neuromuscular function of muscles, using SCS, even if no pain is present.

Goodheart's associate, David Walther, notes that:

> *Neuromuscular dysfunction that responds to strain/counterstrain technique may be from recent trauma, or be buried in the patient's history.*

Goodheart and Walther agree with the interpretation of the role of neurological imbalance, which Jones and Korr (Korr 1975) have described as a key factor leading to many forms of soft-tissue and joint dysfunction (see Chapter 3), in which antagonistic muscles fail to return to neurological equilibrium following acute or chronic strain.

When this happens, an abnormal neuromuscular pattern is established that benefits from being held in 'ease' during a positional release treatment. The muscles that have shortened in the process of strain, and not those stretched (where pain is commonly noted), are the tissues that are used in the process of rebalancing.

'Understanding that the cause of the continued pain one suffers in a SCS condition is usually not at the location of pain but in an antagonistic muscle is the most important step in solving the problem', says Walther (1988).

The tender point might lie in muscle, tendon or ligament but the perpetuating factor is the imbalance in the spindle cell mechanisms. Since the patient can usually easily describe which movements increase the pain (or which are restricted) the search sites for tender areas are easily decided.

Self-help advice

Goodheart's approach can usually be taught to patients for self-help or first-aid use. If taught appropriately, simple stiffness and discomfort can be self-treated.

The patient may have an explanation offered, such as:

- If you wake with a stiff neck, test to see which direction of movement is stiffest, or hurts most.
- From that position, take your head back to its comfortable resting position, and as you do so feel to see which muscles are working to get you there.
- In these muscles, opposite those working when the painful or restricted movement is made, feel around for a very tender point.
- Once you have found this, gently position your head to take the pain away from the point you are lightly pressing – without creating any new pain.
- Once you have done this stay in that 'ease' position for several minutes then slowly return to normal, and see if the stiffness or pain has reduced. It will usually be much better.

More examples of self-help SCS methods are given in Chapter 5.

Reducing the time the position of ease is held

Goodheart has found that it is possible to reduce the length of time during which the position of ease is held, without losing the therapeutic benefits derived from the neurological and/or circulatory effects (as described in Chapter 3) offered by that position being maintained for 90 seconds.

There are two elements to Goodheart's innovation:

1. When the position of ease has been located, a 'respiration assist' is added. The nature of the respiratory strategy used depends upon the location of the tender point: if it lies on the anterior surface of the body, inhalation is used, and if on the posterior aspect, exhalation is used. This phase of breathing is held for as long as is comfortable, during which time the practitioner adds the second element.
2. A stretching of the tissues being palpated (the tender point) is introduced by means of the practitioner's fingers being spread over the tissues (Fig. 4.4).

Walther explains this approach as follows:

The patient takes a deep breath [the inhalation or exhalation phase being held, depending on anterior or posterior location of point] and holds it while the physician spreads his fingers over the previously tender point. The patient is maintained in the 'fine-tuned' position with the physician's fingers spreading the point and respiration assist for 30 seconds, as opposed to 90 seconds required without the assisting factors. On completion the patient is slowly and passively returned to a neutral position.

Is Goodheart's 'respiration assist' instruction too simplistic?

It is necessary to look a little beyond the fact that clinical experience often supports Goodheart's breathing guidelines in application of SCS, in order to gain an understanding of what might be happening physiologically.

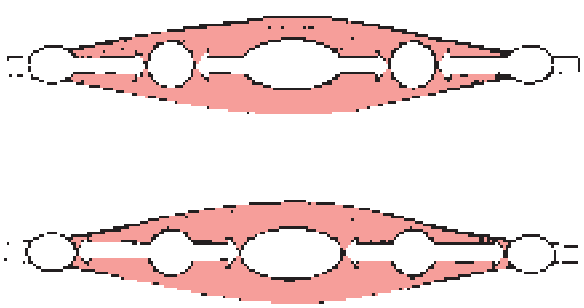

Figure 4.4 Proprioceptive manipulation of muscles. Pressure directed away from the belly of a muscle (B) towards the Golgi tendon organs (A) produces relaxation of the muscle, while pressure towards the belly of a muscle (B) from the region of the Golgi tendon organs (A) tones/'strengthens' it. Pressure near the belly of the muscle (B) towards the muscle spindle (C) weakens it, while pressure away from the spindle (C), near the belly (B), tones/'strengthens' it.

Cummings & Howell (1990) have demonstrated the effects of respiration on myofascial tension, showing that there is a mechanical effect of respiration on resting myofascial tissue (using the elbow flexors as the tissue being evaluated). They quote the work of Kisselkova (1976), who reported that resting EMG activity of the biceps brachii, quadriceps femoris and gastrocnemius muscles, for example, 'cycled with respiration following bicycle ergonometer exercise, thus demonstrating that non-respiratory muscles receive input from the respiratory centres'.

The conclusion was that, 'these studies document both a mechanically and a neurologically mediated influence on the tension produced by myofascial tissues, which gives objective verification of the clinically observed influence of respiration on the musculoskeletal system and validation of its potential role in manipulative therapy'.

But what is that role?

Lewit (1999) has helped to create subdivisions in the simplistic picture of 'breathing in enhances effort' and 'breathing out enhances movement'.

Among the relationships Lewit has identified are that:

- movement into flexion of the lumbar and cervical spines is assisted by exhalation, and
- movement into extension of the lumbar and cervical spine is assisted by inhalation, whereas
- movement into extension of the thoracic spine is assisted by exhalation, while
- thoracic flexion is enhanced by inhalation.

The influences of breathing on the tone of extensor and flexor muscles would therefore seem to be somewhat more complex than Goodheart's suggestions indicate, with an increase in tone being evident in the extensors of the thoracic spine during exhalation, while, at the same time, the flexors of the cervical and lumbar spine are also toned.

Similarly, inhalation increases tone in the flexors of the thoracic spine and the extensors of the cervical and lumbar regions.

Goodheart's proposed pattern of breathing during application of SCS would therefore increase tone in some of the tissues being treated, while inhibiting their antagonists.

Since the 'finger spread', which he also advocates during SCS, increases strength/tone in the tissues being treated, the use of a held breath would seem to require more discrimination than the simple injunction to hold the breath during inhalation when treating flexor muscles, and during exhalation when treating extensors.

What does the finger spread do?

SCS methods act upon the muscle spindles that lie throughout the muscle, with greatest concentration in the center, around the belly (Gowitzke & Milner 1980).

There are many more spindles found in muscles with an active (phasic) function than are found in those with a stabilizing, postural (tonic) function.

The role of spindles (based on the complex interplay between intra- and extrafusal fibers) is as a length comparator, as well as a means for supplying the central nervous system with information as to the rate of change (Figs 4.4 and 4.5). Spindles also exert an effect on the strength displayed by the muscle, a phenomenon used in applied kinesiology (AK) and which Goodheart has incorporated into his version of SCS methodology.

Spindle density is not uniform; for example, muscles in the cervical region contain a high density of muscle spindles, especially the deep suboccipital muscles.

Peck et al (1984) report that:

- rectus capitis posterior minor muscles are rich in proprioceptors, containing an average of 36 spindles/g muscle
- rectus capitis posterior major muscles average 30.5 spindles/g muscle
- in contrast, the splenius capitis contains 7.6 spindles/g muscle
- gluteus maximus contains only 0.8 spindles/g muscle.

'Manipulating' the spindles

If the practitioner's thumbs are placed about 5cm apart over the belly of the muscle, where spindles are

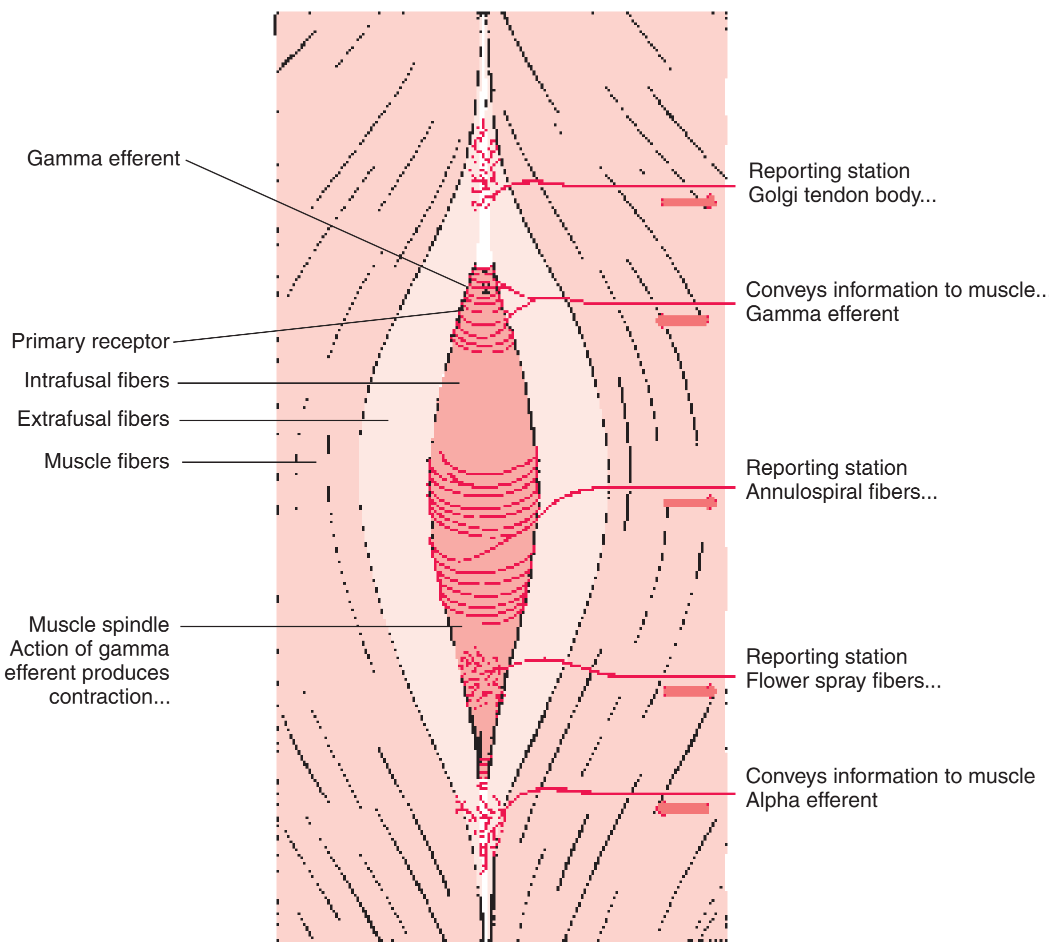

Figure 4.5 Illustration of muscle spindles, showing Golgi tendon organs and neural pathways to and from these reporting stations.

most densely sited, and heavy pressure is exerted by the thumbs pushing towards each other – parallel with the fibers of the muscle in question – a weakening effect will be noted if the muscle has been previously tested and is now tested again (see Fig. 4.4).

The explanation lies in the neurology, as Walther (1988) explains:

> *The digital maneuver appears to take pressure off the intrafusal muscle fibers, causing a decrease in the afferent nerve impulse and, in turn, causing temporary [minutes at most] inhibition of the extrafusal fibers.*

If this experiment fails at first it may be because the precise location of spindles has not been influenced and repetition is called for (and this is especially likely in muscles with sparse spindle presence, such as gluteus maximus; see above regarding spindle density).

This effect of 'weakening' a muscle can be reversed by means of the precisely opposite manipulation of the spindles, in which the thumbs pressing into the tissues are 'pulled' apart. This will only 'strengthen' a hypotonic or inhibited, weak muscle and will not enhance the strength of an already strong one.

Recall that Goodheart suggests applying SCS techniques to muscles only when they initially test as being of 'normal' strength, and then test as weak following a short – 3-second – isometric contraction. This is thought to indicate a neuromuscular imbalance, possibly involving neuromuscular spindle cell function.

The introduction of a spread of the fingers over the spindle cells, during the time in which the tissues in which the spindles lie are being held in a position of ease, strengthens the muscle and inhibits the antagonist to that muscle; a combination of influences that apparently enhances the process of balancing neuromuscular function and reduces the time required for the spindle to 'reset'.

Testing the muscle by means of a short strong isometric contraction after an SCS treatment should subsequently fail to result in its weakening, according to Goodheart's approach.

Psoas treatment using Goodheart's protocol

The supine patient is asked to contract the hip flexors maximally against the practitioner's resistance, by means of hip flexion, adduction and external rotation, for 3 seconds (Fig. 4.6A).

- If the muscle tests as being weaker than previously, it is considered suitable for Goodheart's SCS approach.
- The tender point for psoas usually lies in the belly of the muscle where it crosses the pubic bone.
- This is palpated by a finger and thumb, or two fingers, while the hip is taken into flexion in order to shorten psoas.
- Fine-tuning is introduced to remove sensitivity from the palpated point (Fig. 4.6B).

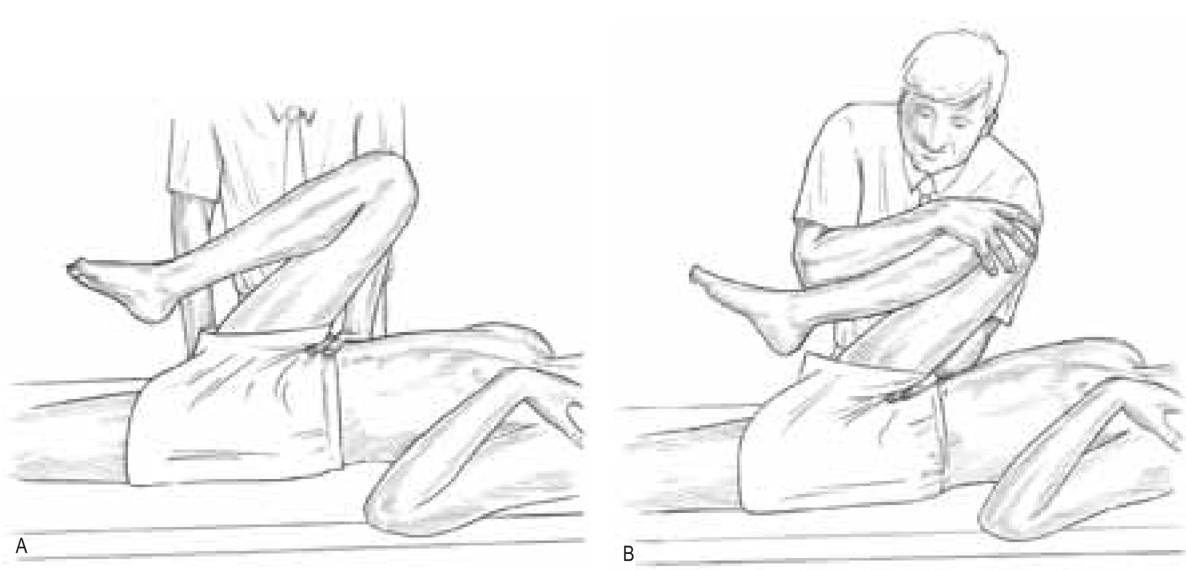

Figure 4.6 Treatment of psoas dysfunction using Goodheart's protocol to achieve ease. (A) hand position, (B) final position of ease.

- Goodheart's refinements are now added, as the patient is asked to inhale deeply and to hold the breath, while at the same time the practitioner strongly spreads the fingers that are in contact with the tender point.
- This is held for 30 seconds, with the patient being told to let the breath go when he feels any sign of strain in holding it.
- After 30 seconds, the patient's leg is very slowly and passively returned to a neutral position.
- A retest of the effects of a short strong isometric contraction should no longer produce a weakening effect, and symptoms of psoas imbalance should be reduced or normalized.

Goodheart's and Morrison's techniques

Different uses of what appear to be SCS mechanisms have been evolved by clinicians such as George Goodheart and Marsh Morrison (see induration technique described in Chapter 1, and the inguinal lift method, later in this chapter).

Coccygeal ('filum terminale cephalad') lift

Goodheart described a method that relies on the crowding, or slackening, of spinal dural tissues, with the coccyx being used as the means of achieving this.

Startling results in terms of improved function and release of hypertonicity in areas some distance from the point of application are claimed (Goodheart 1985). Goodheart's term for this is a 'filum terminale cephalad lift': it is proposed that this be shortened to 'coccygeal lift', at least in this text.

This method focuses on normalizing flexion/extension dysfunction between the spinal column and the spinal cord, despite the spiral nature of the manner in which the spine copes with forced flexion (Illi 1951).

Goodheart and Walther report that there is frequently a dramatic lengthening of the spinal column after application of this procedure, with Goodheart mentioning specifically that, in good health, there should be no difference greater than about half an inch in the measured length of the spinal column sitting, standing and lying, using a tapeless measure which is rolled along the length of the spine.

Goodheart quotes from the work of Upledger and of Breig in order to substantiate physiological and pathological observations which he makes relating to the dura, its normal freedom of movement, and some of its potential for problem-causing when restricted (Breig 1978, Upledger 1984).

Breig states that, using radiography, microscopic examination and mechano-elastic models, it has been shown that there are deforming forces, which relate to normal movements of the spine, impinging on the spinal cord and meninges, from the brainstem to the conus medullaris and the spinal nerves.

Upledger, in discussion of the physiological motion of the central nervous system, recalls that, when assisting in neurosurgery in 1971, in which extradural calcification was being removed from the posterior aspect of the dural tube in the midcervical region, his task was to hold the dura with two pairs of forceps during the procedure. However, he states:

> *The membrane would not hold still, the fully anaesthetized patient was in a sitting position … and it became apparent that the movement of the dural membrane was rhythmical, independent of the patient's cardiac or respiratory rhythms.*

Goodheart states:

> *Tension can be exerted where the foramen magnum is attached to the dura, and also at the 1st, 2nd and 3rd cervicals, which if they are in a state of fixation can limit motion. The dural tube is completely free of any dural attachment all the way down to the 2nd anterior sacral segment where finally the filum terminale attaches to the posterior portion of the 1st coccygeal segment. The release which comes from the coccygeal lift cannot be just a linear longitudinal tension problem. The body is intricately simple and simply intricate and once we understand the closed kinematic chain and the concept of the finite length of the dura, we can see how spinal adjustments can sometimes allow compensations to take place.*

What is happening during this 'lift'?

The anatomy of what is happening and the process of using this procedure is briefly explained as follows (Sutherland 1939, Williams & Warwick 1980):

- The dura mater attaches firmly to the foramen magnum, axis and third cervical vertebrae, and possibly to the atlas, with a direct effect on the meninges.
- Its caudad attachments are to the dorsum of the first coccygeal segment by means of a long filament, the filum terminale.
- Flexion of the spine alters the length of the intervertebral canal, while the cord and the dura have a finite length (the dura being approximately 2.5 inches longer than the cord, allowing some degree of slack when the individual sits), which Goodheart reasons requires some form of 'arrangement' between the caudal and the cephalad attachments of the dura, a 'take-up' mechanism to allow for maintenance of proper tension on the cord.

- Measurement of the distance between the external occipital protuberance to the tip of the coccyx shows very little variation from the standing to the sitting and lying positions.
- However, if all the contours between these points are measured in the different positions, a wide variation is found: the greater the degree of difference the more likely there is to be spinal dysfunction and, Goodheart postulates, dural restriction and possible meningeal tension.
- Tender areas of the neck flexors or extensors are used as the means of monitoring the lift of the coccyx which is to follow: as the palpated pain and/or hypertonicity eases, so is the ideal degree of lift being approached.

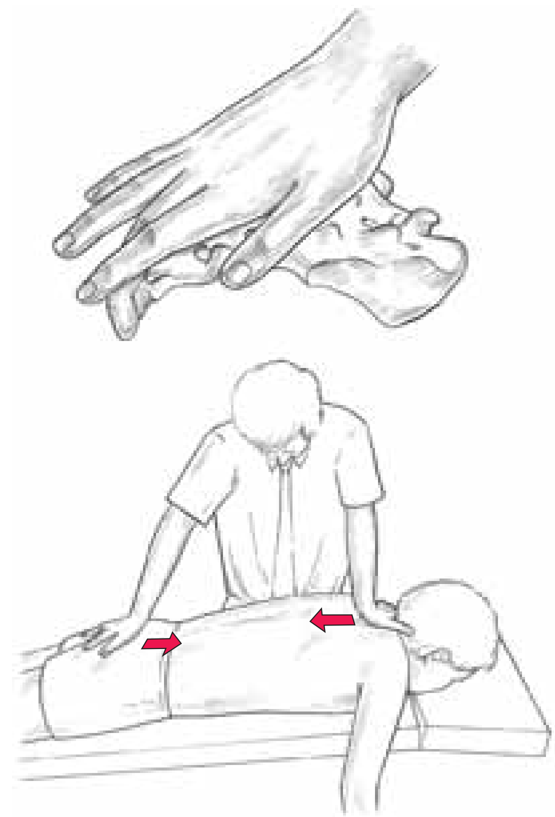

Figure 4.7A and B Goodheart's coccygeal lift technique for release of dural restrictions (see text). Practitioner's left hand is monitoring sensitivity ('tender point') in the cervical region as the coccyx is eased towards the head.

Method

- With the patient prone, the practitioner stands at waist level.
- After palpation and identification of the area of greatest discomfort and/or hypertonicity in the cervical spinal musculature with the practitioner's cephalad hand, the index finger of the caudad hand is placed so that the tip of the index or middle finger is on the very tip of the coccyx, while the hand and fingers follow precisely the contours of the coccyx and sacrum (Figs 4.7A and B).
- This contact slowly and gently takes out the available slack as it lifts the coccyx, along its entire length including the tip, directly towards the painful contact on the neck, using anything up to 15lb (7kg) of force.
- If the painful monitoring point does not ease dramatically, the direction of lift is altered (by a few degrees only) slightly towards one shoulder or the other.
- Once the pain has been removed from the neck point, and without inducing additional pain in the coccyx, this position is maintained for up to one minute.
- Additional ease to the restricted or torsioned dural sleeve can be achieved by using the hand palpating the cervical structures to impart a gentle caudal traction by holding the occipital area in such a way as to lightly compress it, while easing it towards the sacrum (so moving the upper three cervical segments inferiorly) as the patient exhales.
- This hold is maintained for four or five cycles of breathing.

Goodheart and others report dramatic changes in function following use of this procedure, including lengthening of the spine so that it measures equally in all positions, reduction in cervical dysfunction, removal of chronic headaches and release of tension in psoas and piriformis.

Variations

The author has commonly found that the following variations make application of the coccygeal lift less difficult to achieve:

- Once identified, the patient can be requested to apply the compressive force to the cervical tender point being used as a monitor until ease is achieved.
- This frees the practitioner so that positioning and application of the coccygeal lift is less stressful.
- The position described above, as advised by Goodheart and Walther, can be awkward if the practitioner is slight and the patient tall.
- A side-lying position of the patient allows for a less uncomfortable (for the practitioner) application of the procedure.

- In this instance, the patient monitors the pain in the cervical area once the practitioner has identified it.
- The practitioner stands at upper thigh level, behind the side-lying patient, and, using the fifth finger aspect of the cephalad hand, makes contact along the whole length of the coccyx (the tip of which is cushioned in the hyperthenar eminence), with the elbow braced against his own hip/abdomen area.
- The force required to achieve the lift is applied by means of the practitioner leaning into the hand contact, while the caudad hand stabilizes the anterior pelvis of the patient.
- As in Jones's SCS methods, the patient reports on the changes in palpated pain levels until a 70% reduction is achieved.

Morrison's 'inguinal lift'

American chiropractor Marsh Morrison was responsible for popularizing a number of methods that bear a close resemblance to SCS, and which certainly fall into the context of positional release methods.

His 'induration' technique was described in Chapter 1, and in this chapter a method that has a passing similarity to Goodheart's coccygeal lift method, is described.

Morrison maintained that most women who periodically wear high heels present with a degree of what he termed 'pelvic slippage' that is associated with undue pelvic and low back stress (Morrison 1969).

The use of the inguinal lift is meant to enable low back manipulation and mobilization methods to be more effective, by balancing ligamentous and muscular tension patterns. Morrison recommended its application when low back problems failed to respond to more usual methods, since he maintained that the pelvic imbalance could act to prevent the normalization of spinal dysfunction.

Method

- The patient lies supine with legs apart.
- The superior margin of the pubis should be palpated, close to the inguinal area.
- Pain will be found on the side of 'slippage'.
- This painful site is palpated by the patient and the same reporting of a numerical value for the pain as was described in detail in Chapter 3 should be used, with the objective of reducing pain during the procedure, from a starting level of 10, by at least 70%.
- The patient (if male) should be asked to hold the genitals towards the non-treated side.
- Whether the patient is male or female, a second person should be in the room, since the practitioner is in a vulnerable position when engaging the inguinal area.
- The practitioner stands to the side of the patient, just below waist level on the side to be treated, and places the flat table-side hand on the inner thigh so that the web between finger and thumb comes into contact with the tendon of gracilis, at the ischiopubic junction.
- It is important to have the contact hand on the gracilis tendon relaxed, not rigid, with the 'lift' effort being introduced via a whole-body effort, rather than by means of pushing with that hand, in order to minimize the potential sensitivity of the region.
- Light pressure, superiorly directed, is then made to assess for discomfort.
- If the pressure is tolerable, the hemipelvis on the affected side is 'lifted' towards the shoulder on that side until pain reduces adequately in the palpated tender point, and this position is held for 30 seconds.
- The author has found that introduction of a degree of lift towards the ceiling via the contact hand (sometimes involving support from the other hand) often allows for a greater degree of pain reduction in the palpated point.

Morrison described 'multiple releases' of tension in supporting soft tissues, as well as a more balanced pelvic mechanism.

The author confirms that this is an extremely valuable method that can be applied to lower abdominal 'tension' as well as to pelvic imbalances.

By removing the tension from highly stressed ligamentous and other soft tissues in the pelvis, some degree of rebalancing normalization occurs. Whether this involves the same mechanisms as are thought to occur when SCS is applied, or whether it relates directly to Goodheart's coccygeal lift method, remains for further evaluation. It is an example of positional release, involving a palpated pain point being used as a monitor, and so fits well with SCS methodology.

Positional release and cranial treatment

There is little if any debate regarding the pliability and plasticity of infant skulls. However, in order for cranial manipulation of adults, as currently taught and practiced, to be taken seriously, it is necessary to establish whether or not there is evidence of verifiable motion between the cranial bones during and throughout adult life.

Sutherland (1939) observed mobile articulation between the cranial bones almost 100 years ago and researched the relevance of this for the rest of his life. He also described the influence of the intracranial ligaments and fascia on cranial motion, which he suggested acted (at least in part for they certainly have other functions) to balance motion within the skull.

Sutherland further suggested that there existed what he termed a 'primary respiratory mechanism' which was the motive force for cranial motion. This mechanism, he believed, was the result of the influence of a rhythmic action of the brain, which led to repetitive dilatation and contraction of cerebral ventricles and which was thereby instrumental in the pumping of cerebrospinal fluid (CSF).

The reciprocal tension membranes (mainly the tentorium cerebelli and the falx cerebri), which are themselves extensions of the meninges, along with other contiguous and continuous dural structures, received detailed attention from Sutherland. He described these soft tissues as taking part in a movement sequence which, because of their direct link (via the dura and the cord) between the occiput and the sacrum, produced a total craniosacral movement sequence in which, as cranial motion took place, force was transmitted via the dura to the sacrum, producing in it an involuntary motion.

Five key elements of the cranial hypothesis that Sutherland (1939) proposed were:

- an inherent motility of the brain and spinal cord
- fluctuating CSF
- motility of intracranial and spinal membranes
- mobility of the bones of the skull
- involuntary sacral motion between the ilia.

How do these propositions stand up to examination?

The evidence is that inherent motility of the brain has been proven (Frymann 1971); however, the impact of this function on cranial bone mobility is possibly less than Sutherland imagined. Cranial motion probably contributes towards the composite of forces/pulses which it has been suggested go towards producing what is known as the cranial rhythmic impulse – CRI (Greenman 1989, Magoun 1976, McPartland & Mein 1997).

The CSF fluctuates, but its role remains unclear in terms of cranial motion. Whether it helps drive the observed motion of the brain, or whether its motion is a by-product of cranial (and brain) motion remains uncertain.

The intracranial membranous structures (falx, etc.) are clearly important, since they attach strongly to the internal skull and give shape to the venous sinuses.

Dysfunction involving the cranial bones must therefore influence the status of these soft-tissue structures, which strongly attach to them, and vice versa. To what degree they influence sacral motion is, however, questionable.

The bones of the skull can undoubtedly move at their sutures, albeit to a minute degree (Zanakis 1996). Whether this capacity is simply plasticity that allows accommodation to intra- and extracranial forces, or whether the constant rhythmical motion, the CRI, drives a distinct cranial motion, is debatable.

The clinical implications of restrictions of the cranial articulations seem to be proven, although dispute exists as to precise implications.

There seems to be involuntary motion of the sacrum between the ilia, but the means whereby this occurs remains unclear (or at least unproven), as does the significance of this motion in terms of cranial mechanics.

In adults, most cranial treatments that attempt to normalize perceived restrictions, or to influence function, involve indirect, positional release-type techniques.

Treatment of cranial structures

John Upledger, the internationally acknowledged craniosacral expert, suggests that in order for cranial structures to be satisfactorily and safely treated, 'indirect' approaches are best (Upledger & Vredevoogd 1983).

By following any restricted structure to its easy unforced limit, in the direction towards which it moves most easily ('the direction towards which it exhibits the greatest range of inherent motion'), a sense may be noted in which the tissues seem to 'push back' from that extreme position, at which time the practitioner is advised to become 'immovable', not forcing the tissues against the resistance barrier, or trying to urge it towards greater 'ease', but simply refusing to allow movement.

Upledger et al (1979) explain that, 'it is the inherent motion of the structure as it attempts to return to neutral, that pushes against you'.

It is not within the scope of this text to fully explore these concepts, some of which have been validated by animal and human research. However, a brief summary is needed in order for positional release applications to the cranial structures to be understood in the context of their clinical use (Chaitow 1999, Marmarou et al 1975, Moskalenko et al 1961, Upledger & Vredevoogd 1983).

Greenman (1989) summarizes cranial flexibility as follows:

> *Craniosacral motion involves a combination of articular mobility and change in the tensions within the (intracranial) membranes. It is through the membranes' attachment that the synchronous movement of the cranium and the sacrum occurs.*

During cranial motion, he explains:

The sutures appear to be organized to permit and guide certain types of movement between the cranial bones. These are intimately attached to the dura, and the sutures contain vascular and nervous system elements. The fibers within the sutures appear to be present in directions, which permit and yield to certain motions.

In one model of cranial theory the movement of the cranial elements is said to be driven, at least in part, by a coiling and uncoiling process in which the cerebral hemispheres appear to swing upwards during what is known as cranial flexion, and then to descend again during the extension mode of the cranial cycle.

As the flexion phase occurs, the paired and unpaired bones of the head are thought to respond in symmetrical fashion, which is both palpable and capable of being assessed for restriction.

A variety of other theories exist to explain cranial motion (Heisey & Adams 1993), ranging from biomechanical explanations, in which respiration and muscular activity are the prime movers, to circulatory models, in which venomotion and CSF fluctuations are responsible, and even compound 'entrainment' theories in which the body's multiple oscillations and pulsations combine to form harmonic influences (McPartland & Mein 1997). The truth is that while an undoubted, if minute (Lewandowski et al 1996), degree of motility (self-actuated movement) and mobility (movement induced by external features) can be demonstrated at the cranial sutures, many explanations for the mechanisms involved are as yet based on conjecture.

Motions noted at the sphenobasilar junction

During cranial flexion it is suggested by Upledger & Vredevoogd (1983) and others that the following movements take place simultaneously (it is important to realize that cranial motion is a plastic one rather than one involving gross movement):

- a reduction in the vertical diameter of the skull
- a reduction in the anteroposterior diameter
- an increase in the cranial transverse diameter.

These 'movements' are extremely small, in the region of 0.25 mm (250 microns) at the sagittal suture (Zanakis 1996).

Put simply, this means the skull gets 'flatter', narrower from front to back, and wider from side to side. This is all said to happen as the occiput is described as easing forwards at its base, causing the sphenoid to rise at its synchondrosis (Figs 4.8A and B).

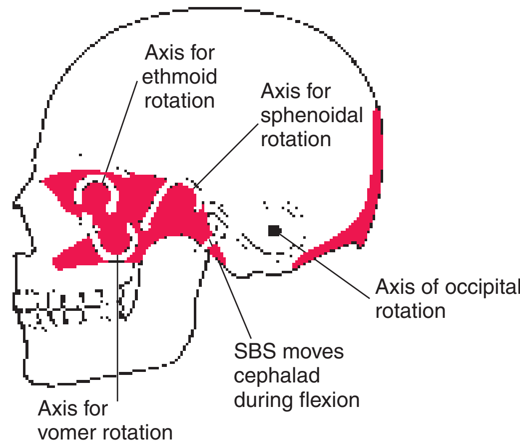

Figure 4.8A Schematic representation of cranial motion. During flexion, the occiput is thought to move anterosuperior, which causes the sphenoid to rise at its synchondrosis. Simultaneous movement occurs in the frontal, facial and nasal bones as indicated. The extension phase of this motion involves a return to a neutral position. SBS, sphenobasilar synchondrosis.

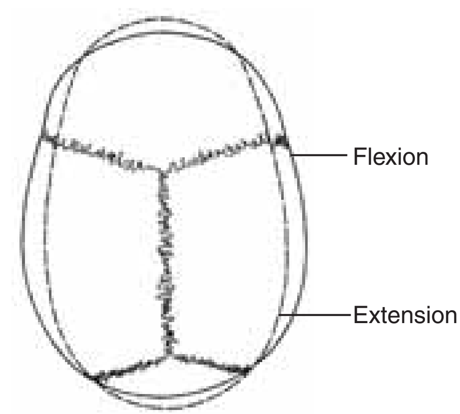

Figure 4.8B The flexion phase of cranial motion ('inhalation phase') causes the skull as a whole to widen and flatten.

Because of its unique structure, this then causes the great wings of the sphenoid to rotate anteriorly, followed by the frontal and facial bones. The temporals and other cranial bones are then said to accommodate this motion by externally rotating.

Two cranial exercises

Two exercises are described below that should allow the reader to get a sense of the subtlety of cranial methodology, and of the influence of positioning in order to effect a change.

Caution

D'Ambrogio & Roth (1997) caution that:

> *With any cranial treatment it is recommended that certain precautions be taken. Symptoms and signs of space-occupying lesions and acute head trauma are clear contraindications. A history of seizures or previous cerebrovascular accident should be approached with caution.*

1. Exercise in sphenobasilar assessment and treatment

- A useful exercise can be performed in which the model/patient is supine and the practitioner sits to the right or left near the head of the table.
- The caudad hand rests on the table holding the occipital area so that the occipital squama closest to the practitioner rests on the hyperthenar eminence while the tips of the fingers support the opposite occipital angle (Fig. 4.9).
- The cephalad hand rests over the frontal bone so that the thumb lies on one great wing and the tips of the fingers on the other great wing, with as little contact as possible on the frontal bone.
- If the hand is small, the contacts can be made on the lateral angles of the frontal bone.
- It is necessary to sit quietly in this position for some minutes in an attempt to palpate cranial motion.
- As sphenobasilar flexion commences (as a sense of 'fullness' is noted in the palpating hand), apparent occipital movement may be noted in a caudad and anterior direction; simultaneously the great wings of the sphenoid may seem to rotate anteriorly and caudally around their transverse axis.

Figure 4.9 Sphenobasilar assessment: hand positions.

- Encouragement of these motions can be introduced in order to assess any existing restriction.
- This is achieved by using very light (grams rather than ounces) pressure in the appropriate directions to impede the movement described.
- During sphenobasilar extension (as the sense of fullness in the palpating hand recedes), a return to neutral may be noted, as the hands appear to return to the starting position.
- Whichever of these motions (flexion, extension) is assessed as being *least* restricted should then be encouraged.
- As this is done, a very slight 'yielding' motion may be noted at the end of the range.
- The tissues should be held in this direction of greatest ease until a sense occurs of the tissues 'pushing back' towards the neutral position.
- A great deal of sensitivity is needed in order to achieve this successfully.

Note It is worth emphasizing the author's belief that while the cranial movements described may be palpated and perceived by the sensitive individual, precisely what is moving, and what moves it, remains unproven. The description of cranial motion given above expresses Upledger's (1984) belief as to what is happening (which is widely held to be 'true' in craniosacral circles) but remains unproven (Chaitow 2005).

2. Temporal freedom of movement exercise (Figs 4.10A and B)

- Sit at the head of the supine model/patient.
- Interlock your fingers (or have the hands cupped, with one in the other) so that the head is cradled, your thumbs are on, and are parallel with, the anterior surfaces of the mastoid processes, while the thenar eminences support the mastoid portion of the bone.
- Your index fingers should cross each other and be in direct contact.
- Assess the freedom of flexion of one side and then the other.
- This is achieved by focusing on the thumb contact on one side at a time.
- As the temporal bones move into the flexion phase the mastoid appears to ease very slightly posteriorly and medially (see Fig. 4.9B)
- This is more a sense of 'give' or plasticity, than actual movement.
- Assess one side and then the other several times, using a very small amount of contact pressure – no more than would be comfortable were this applied to your open eye.

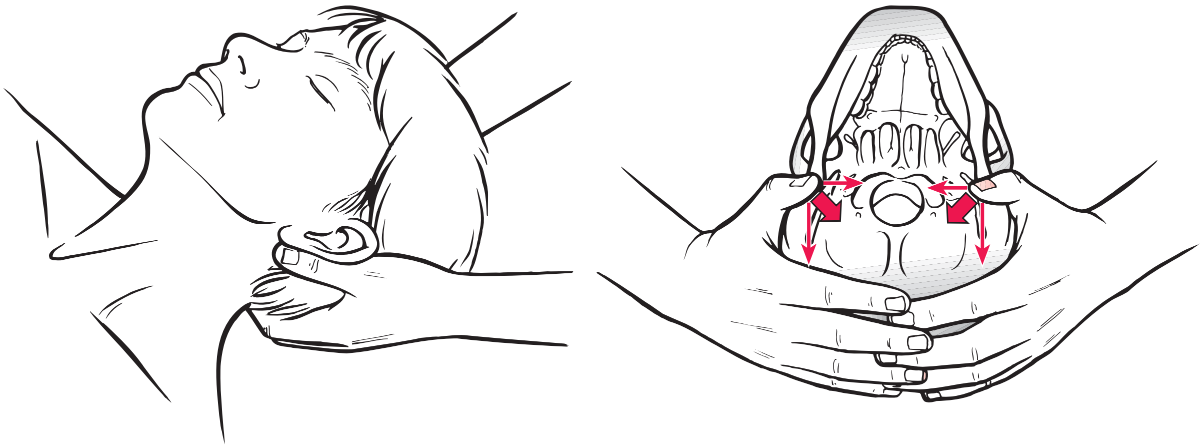

Figure 4.10 (A) Hand and thumb positions for temporal freedom exercise. (B) Directions of motion of the mastoid to encourage temporal flexion. (From Chaitow 1999.)

- By pivoting the middle joints of your index fingers against each other in rhythm with cranial flexion and extension (a very slight sense of fullness in the palms of the hands equates with the flexion phase), this can be achieved without use of actual hand or thumb strength.
- The amount of pressure introduced at the mastoid should be in grams only, and should only be attempting to evaluate whether there is symmetry of easy motion on each side.
- Test slight variations in the directions of applied pressure (grams only) as shown on Figure 4.10B.
- If one side appears to 'move' more freely into flexion, to be more resilient, more plastic, have more give, this is the side of relative freedom of movement.
- To evaluate whether this can be modified towards better balance (equal degree of freedom of movement bilaterally) ease the 'free' side towards its direction of free movement (posteromedially) and hold it there, while at the same time placing the thumb on the other side posterior to the mastoid in order to ease it anterolaterally.
- Hold this for four or five cycles of inhalation/exhalation, or until a sense of pressure against your palpating thumbs is noted.
- At that time release the pressure (grams only!) and reassess to see whether the exercise has created a more balanced sense of motion or plasticity.

Jones's SCS cranial approach

The developer of SCS, Laurence Jones, has also focused attention on cranial dysfunction (Jones 1981) and suggests specific corrective methods for pain ('tender points') or restrictions (Figs 4.11A, B and C).

It may be useful to superimpose these cranial points onto the image shown in Figure 4.11D, showing the superficial muscles of the neck and head.

Consider also the compression/crowding measures suggested (below) to treat these tender points, and how this would modify, shorten, crowd particular structures, particularly if the concept of tensegrity is considered (see Box 3.1).

Locating cranial tender points

Locating the tender points listed below and illustrated in Figure 4.11 (based on Jones's extensive research and clinical experience) is a matter of gentle fingertip palpation.

Despite there being only a very shallow layer of muscle in most of the locations described, trigger points are commonly located on the cranium, and care is needed as to how much pressure is applied.

The suggestion is that the palpating digit should produce just enough discomfort for the patient to register the sensitivity and be able to report on the easing of intensity as positional release is attempted.

How much force?

The author believes that the amount of effort required to produce 'ease' when working on the cranium should be minimal, and should not exceed ounces.

The opinions expressed by others are listed below.

- Jones (1981) speaks of 10 lb (5 kg) of pressure and more.
- D'Ambrogio & Roth (1997) suggest no more than 1 lb (0.5 kg) of pressure (this is the degree of force advocated by this text as a maximum, less if possible).
- Upledger (1984), however, believes 5 g of pressure to be adequate.

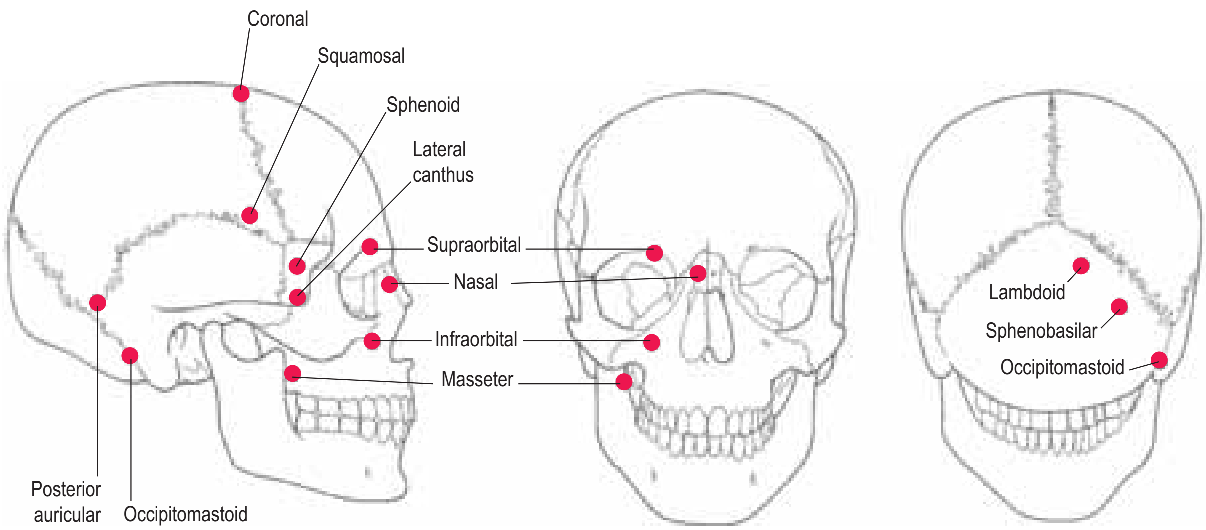

Figure 4.11A, B and C Jones's cranial tender point locations.

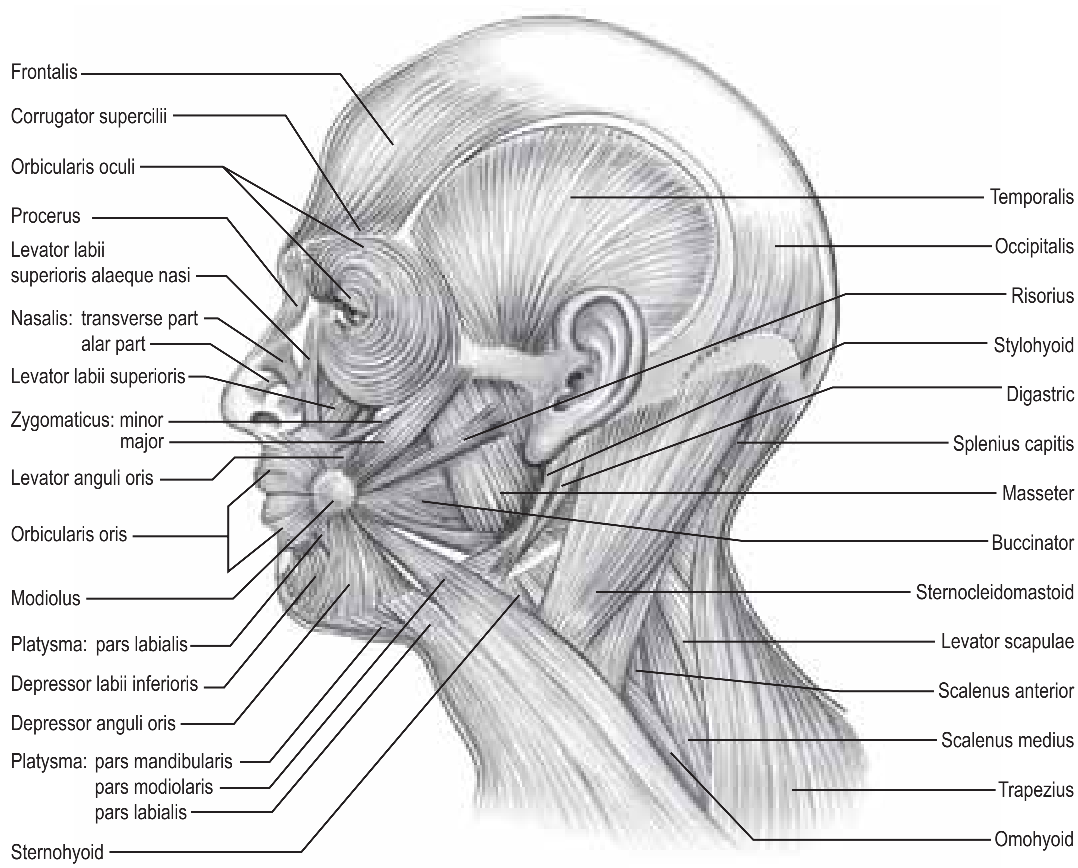

Figure 4.11D Muscles of the head and neck (superficial lateral view) including circumorbital, buccolabial, nasal, epicranial, masticatory and cervical groups. The articular muscles are omitted. Risorius, a variable muscle, here has two fasciculi, of which the lower one is unlabelled. The laminae of the direct labial tractors to both upper and lower lips have been transected to reveal orbicularis oris underneath. (From *Gray's Anatomy*, 38th edn.)

- Pick (1999) has described a practical method for evaluating the ideal 'working' level in different tissues, those that are close to bone and those that have many layers of soft tissue between the surface and bone (Fig. 4.12).

When positioning tissues into ease, varying but light forces should be used in order to ease the palpated pain/sensitivity. Once this has been achieved, the instructions in the text to 'hold the position for up to 90 seconds' will be seen.

It is worth keeping the words of Upledger in mind, regarding 'sensing' the tissues 'pushing back', at which time it is suggested that the structure be held towards the position of ease.

This approach is valid, although there is a difference between the underlying approaches of Jones and Upledger. While Upledger relates his guidelines to craniosacral therapy, Jones is clear that he does not:

> *By the time I had begun to adapt my method to treat cranial disorders, I had acquired an abiding faith in the reliability of the tender points to report the efficacy of treatment. I claim no mechanical understanding of the skull, but I am able to relieve most cranial problems simply by relying on feedback from the tender points. The method probably is not comparable to the cranial studies developed by Dr WG Sutherland (cranial osteopath) but it is much easier to learn and it does an excellent job. On these terms I am willing to forgo mechanical understanding.*

As indicated, the amount of pressure suggested by Jones displays his lack of awareness of (or belief in) the delicacy of the cranial structure, and so the recommended degree of pressure described in the methods outlined below is a scaled down version of Jones's recommendations, and is in line with craniosacral levels of force – ounces (grams) or less, rather than pounds (kilos).

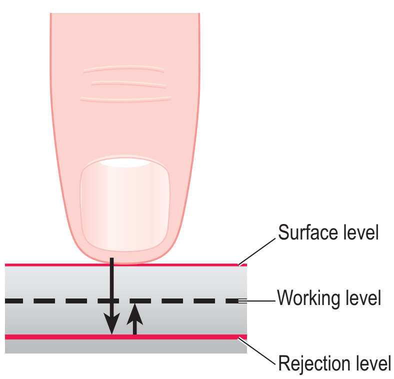

Figure 4.12 The concept of a 'working level'. Surface level involves touch without any pressure at all. Rejection level is where pressure meets a sense of the tissues 'pushing back', defensively. By reducing pressure slightly from the rejection level, the contact arrives at the working level, where perception of tissue change should be keenest, as well as there being an ability to distinguish normal from abnormal tissue (hypertonic, fibrotic, edematous etc.). (From Chaitow 1999.)

Treatment of cranial dysfunction using Jones's tender points

Jones reports that suitable treatment of dysfunction using the tender points numbered and described below, by positional release, can positively influence a variety of local problems and sensitivities (pain or sensitivity in the tender points, for example), as well as assisting in the resolution of a number of common complaints (Box 4.2).

1. Coronal and sagittal tender points

- The coronal tender point lies on the parietal bone, 1cm from the anterior medial corner where the coronal and sagittal sutures meet.
- Tender points may also be found on either side of the sagittal suture anywhere between the bregma and the lambda.
- With the patient supine and the practitioner seated at the head, the tender point is monitored while light pressure is applied caudally to the identical site on the non-affected parietal until sensitivity vanishes from the tender point (Fig. 4.13).
- This is held for up to 90 seconds.

2. Infraorbital (or maxillary) tender point

- The infraorbital (or maxillary) tender point is located close to the emergence of the infraorbital nerve (Fig. 4.14).
- Sensitivity here is commonly associated with sinus headache symptoms.
- The patient is supine with the practitioner seated at the head of the table.
- The interlocked hands of the practitioner are placed over the face so that the middles of the palms of the hands rest over the cheekbones.
- Pressure (very light) is applied obliquely, medially and posteriorly, with both hands – as though the heels of the hands are being brought together.
- Mild discomfort is often noted even with light pressure (ounces only, not the 8lb suggested by Jones!).
- This compressive effort needs to be sustained until a marked feeling of decongestion is reported, along with relief of any sense of pressure previously felt behind the nose.

Box 4.2 Common complaints assisted by treatment of cranial tender points

Infraorbital tender point:
- Periorbital headaches
- Maxillary sinus problems

Lateral canthus tender point:
- Upper dental neuritis

Masseter tender point:
- Earache
- Lower dental neuritis

Nasal tender point:
- Periorbital headaches
- Nasal congestion

Occipitomastoid tender point:
- Frontal and periorbital headaches
- Earache
- Vertigo
- Dysphagia

Posterior auricular tender point:
- Tinnitus

Sphenoid tender point:
- Upper dental neuritis

Squamosal tender point:
- Periorbital headaches
- Upper dental neuritis

Zygomatic tender point:
- Tinnitus
- Earache

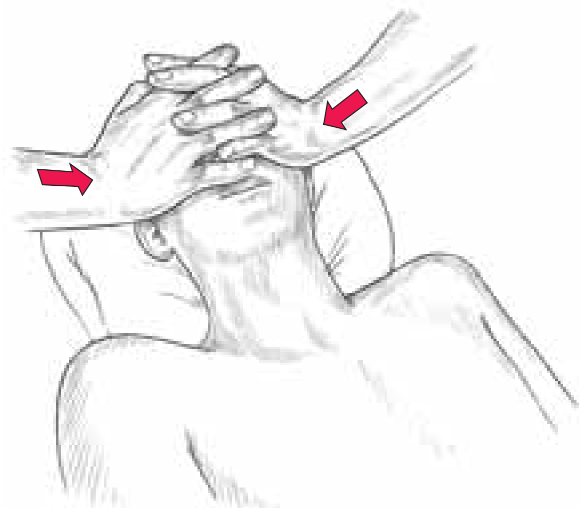

Figure 4.14 Infraorbital tender points, palpation and treatment contacts (only ounces of pressure at most).

3. Lambdoidal dysfunction

- The lambdoidal dysfunction tender point lies on the occipital bone, just medial to the lambdoidal suture approximately 2.5 cm below the level of the lambda, obliquely above and slightly lateral to the inion.
- Positional release treatment is applied via light compression of precisely the same site on the contralateral side of the occipital bone (Fig. 4.15), until discomfort vanishes from the palpated tender point.
- The direction in which pressure is applied can vary from an anterior direction to a medial one, whichever produces ease in the tenderness, involving a light pressure of the treatment area towards the tender point site.

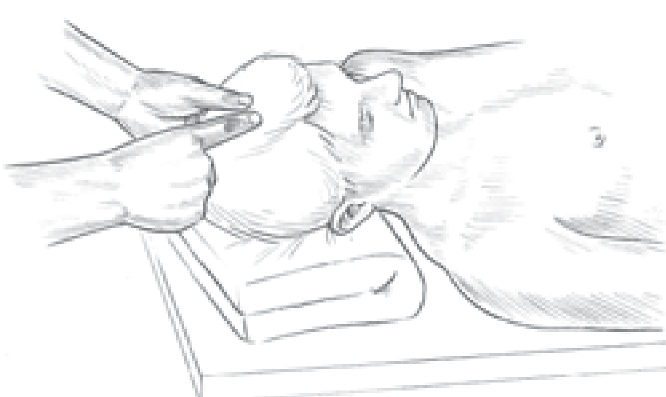

Figure 4.13 Coronal tender point, palpation and treatment contacts and hand positions.

Figure 4.15 Lambdoidal dysfunction palpation and treatment contacts and hand positions.

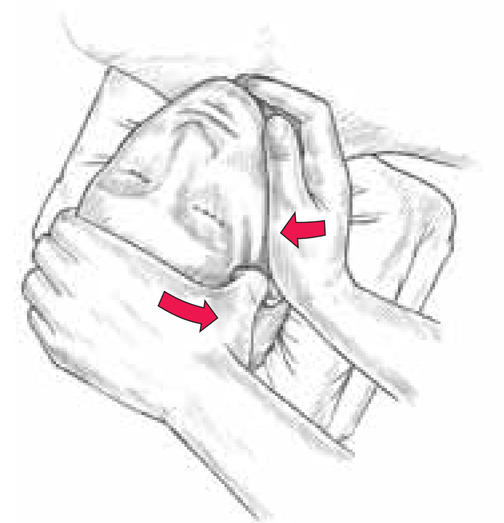

Figure 4.16 Lateral canthus (right side) dysfunction/tender point palpation and treatment contacts and hand positions.

- The patient should be seated or prone for easy access to the points (tender point and treatment point).

4. Lateral canthus

- The lateral canthus tender point lies in the temporal fossa, approximately 2cm lateral to the end of the lateral canthus.
- The practitioner is on the ipsilateral side and treatment to the supine patient involves the practitioner's cephalad hand spanning the frontal bone so that the thumb can rest on the tender point as a monitor (Fig. 4.16).
- The other hand, using the thenar eminence as a contact, applies superiorly directed pressure towards the palpating thumb, via a contact on the zygomatic bone and the zygomatic process of the maxilla.
- The palpating cephalad hand exerts light pressure on the frontal bone towards the zygoma, so crowding the tissues and articulations in the area.
- Varying directions of application of these forces should be attempted until sensitivity in the palpated point eases markedly.
- The position of ease is maintained for up to 90 seconds.

5. Masseter

- The masseter tender point lies on the anterior border of the ascending ramus of the mandible, and may be involved in temporomandibular (TMJ) dysfunction as well as mandibular neuritis.
- The patient should be supine, with the jaw slack and the mouth open approximately 1cm (Fig. 4.17).
- The practitioner is seated or stands on the non-affected side, the heel of the caudad hand resting on the point of the chin, applying very light pressure towards the affected side as the index finger of that hand monitors the tender point.
- The other hand, which lies on the dysfunctional side of the patient's head (on the parietal/temporal area), offers counterforce to the palpating hand's pressure via the heel of the hand which is stabilizing the head, while the fingers (which are just above the zygoma) lightly press towards the tender point.

6. Nasal dysfunction

- The nasal dysfunction tender point is located on the side of the bridge of the nose and, as this is palpated, tenderness is relieved by application of light pressure towards it from the same point on the contralateral side of the nose (Fig. 4.18).

7. Occipitomastoid

- The occipitomastoid tender point lies in a vertical depression just medial to the mastoid process approximately 3cm superior to its tip.
- The patient lies supine and the practitioner holds the head in both hands (Fig. 4.19), with one finger on the tender point.
- The heels of the hands contact the parietal bones, the practitioner making absolutely certain that they are superior to the suture line between it and the temporal bones.

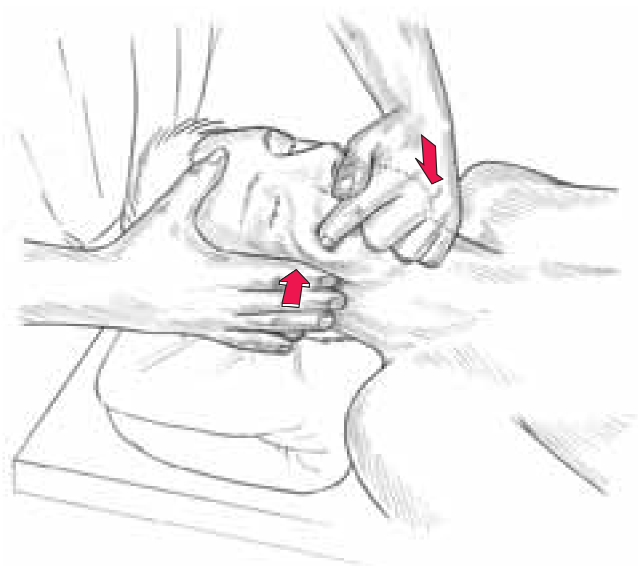

Figure 4.17 Masseter (right side) dysfunction/tender point palpation and treatment contacts and hand positions.

- A very slight (ounces at most) effort is introduced by each hand – one 'screwing' its contact clockwise and the other anticlockwise – until sensitivity vanishes from the tender point.
- The counter-rotation produced in this way attempts to cause the temporal bones to rotate in opposite directions around a transverse axis.
- The particular mechanics involved in the dysfunction will determine which side of the head, the ipsilateral or contralateral, requires a clockwise or an anticlockwise rotational effort.
- Once the tender point palpates as much less sensitive than previous to the introduction of counter-rotation, this is held for 90 seconds.

Figure 4.18 Nasal dysfunction/tender (right side) point palpation and treatment contacts and hand positions.

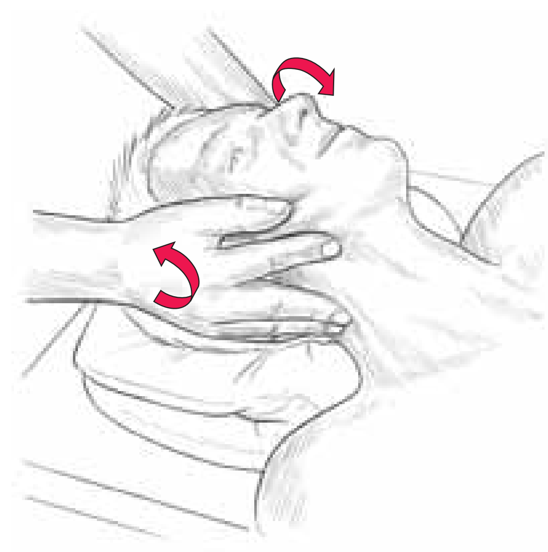

Figure 4.19 Occipitomastoid dysfunction/tender point palpation and treatment contacts and hand positions.

8. Posterior auricular

- The posterior auricular tender point lies in a slight depression approximately 4cm behind the pinna of the ear, just below its upper border (Fig. 4.20).
- Treatment requires the patient to be side-lying, with the affected side uppermost, resting on a small cushion which supports both the ear and zygoma of the contralateral side.
- Light pressure is applied to the parietal bone to 'bend' the skull 'sideward and over an anteroposterior axis' (Jones's words).
- Counterpressure can usefully be offered by the other hand.
- This should remove the pain from the tender point and should be held for up to 90 seconds.
- Jones reports that tinnitus and dizziness often respond well to easing of tenderness in this point.

9. Sphenobasilar

- The sphenobasilar tender point lies 2cm medial to the lambdoidal suture, above the level of the inion.
- Treatment (Fig. 4.21) involves the practitioner cupping the occipital bone (patient supine, practitioner seated at head of table) in one hand and the frontal bone in the other; tenderness in the point can be monitored by one of the fingers of the inferior hand cupping the occiput.
- Gentle counter-rotation to the frontal and occipital bones is then introduced, producing torsion through an anteroposterior axis.

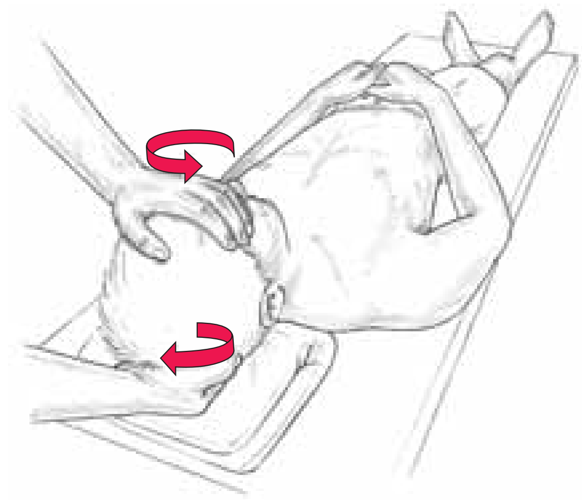

Figure 4.21 Sphenobasilar dysfunction/tender point palpation and treatment contacts and hand positions (use ounces of pressure at most).

- Counter-rotation (one hand going clockwise, the other counterclockwise) will be found to relieve the tender point sensitivity more effectively in one pair of directions than the other, and this should be maintained for 90 seconds.
- The amount of force introduced in these contacts should be minimal, involving ounces only.

Figure 4.20 Posterior auricular (right side) dysfunction/tender point palpation and treatment contacts and hand positions.

10. Sphenoid

- The sphenoid (or lateral sphenobasilar) tender point lies on the great wing of the sphenoid, in a depression close to the lateral ridge of the orbit.
- Jones notes that the temple on the affected side will normally palpate as more prominent than its pair and that the tenderness may relate to tension in the temporalis muscle, as well as to the eccentric stress on the sphenoid.
- Positional release treatment is achieved by the application of pressure (light, ounces only) with the heel of one hand from the contralateral great wing towards the monitoring index finger contact on the affected side, which offers counterpressure (Fig. 4.22).

11. Squamosal suture

- The tender point on the squamosal suture lies on the superior border of the temporal bone and is best palpated from above (Fig. 4.23).
- The patient should be side-lying with a pillow under the head and the affected side uppermost.
- Positional release is achieved by placement of three fingers above and parallel to the temporoparietal articulation, distracting the parietal bone away from the temporal bone.
- Light pressure only is required (grams or ounces at most).

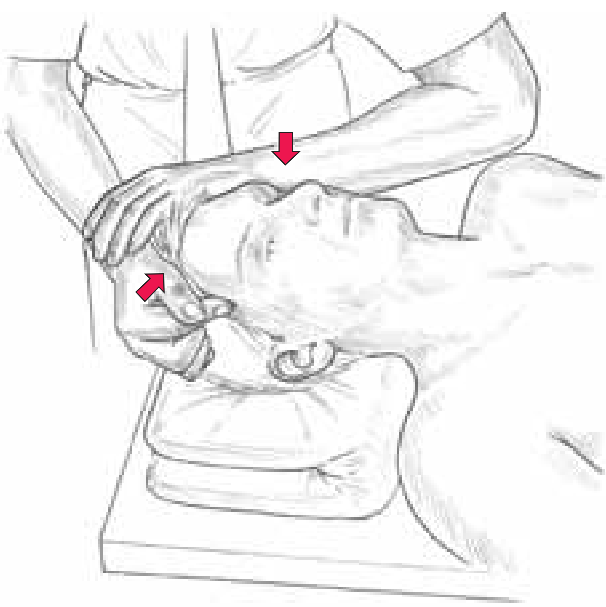

Figure 4.22 Sphenoid (right side) dysfunction/tender point palpation and treatment contacts and hand positions (use very light pressure only).

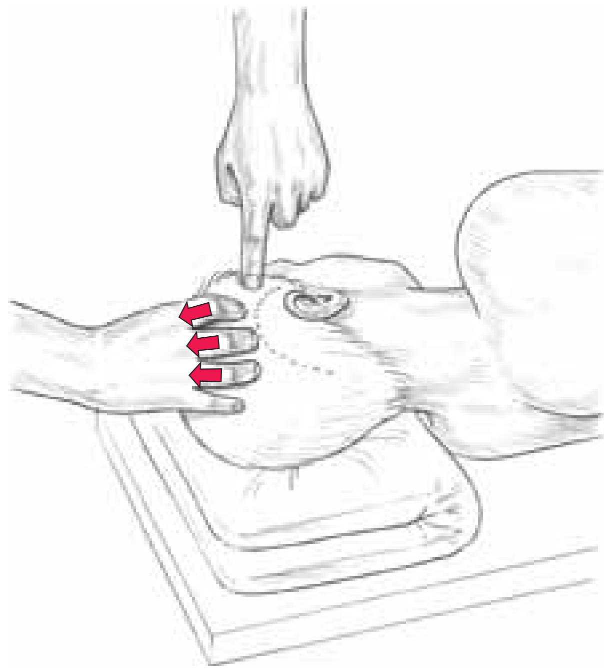

Figure 4.23 Squamosal (right side) dysfunction/tender point palpation and treatment contacts and hand positions.

- The angle of 'pull' should be varied until the pain noted from pressure on the tender point is reduced markedly or vanishes completely.
- This is held for 90 seconds or until a 'softening' warmth is noted.

Figure 4.24 Masseter muscle (right side) dysfunction/tender point palpation and treatment contacts and hand positions.

- If the tender point is more anterior, closer to the squamosal border, then the contact fingers would be placed on the frontal bone, and it is this that would be distracted obliquely away from the temporal bone in an anterosuperior direction, until pain is reduced or vanishes.

Jones reports that treating this point often relieves upper dental neuritis.

12. Zygomatic

The zygomatic tender point lies just above the zygomatic arch of the temporal bone, about 3cm anterior to the external auditory meatus.

Treatment is identical to that applied to the lateral canthus point (Fig. 4.16), except that the 'crowding' forces are applied approximately 4cm (1.5 inches) more posteriorly.

Positional release methods for TMJ problems

Method 1

DiGiovanna (Scariati 1991) describes a counterstrain method for treating tenderness in the masseter muscle (Fig. 4.24).

- The patient is supine and the practitioner sits at the head of the table.
- One finger monitors the tender point in the masseter muscle, below the zygomatic process.
- The patient is asked to relax the jaw and, with the free hand, the practitioner eases the jaw towards the affected side until the tender point is no longer painful.
- This is held for 90 seconds before a return is allowed to neutral and the point repalpated.

See also Figure 4.17.

Method 2 (TMJ compression and decompression)

Upledger uses a positional release via 'decompression' on the TMJ, as a preliminary to application of a gentle traction on the joint in order to disengage over-approximation.

The TMJ can be treated by a simple approach involving 'crowding' or compression followed by traction or decompression (Upledger & Vredevoogd 1983).

- The contact (no squeezing just a non-sliding contact) is on the skin.
- The palms and fingertips are placed on the skin of the cheeks of the supine patient as the practitioner sits at the head.
- Light traction on the skin pulls on connective tissue, which is attached to bone.

Figure 4.25A TMJ treatment crowding/compression stage of treatment (Upledger & Vredevoogd 1983).

Figure 4.25B Distraction/release phase of TMJ treatment.

- The skin is taken to a point of resistance as the hands are drawn cephalad (taking out the slack).
- This is held until any sense of the structures moving, or repositioning themselves, ceases – which could take a minute or more (Fig. 4.25A).
- At this time, skin traction is introduced in a caudad direction, and held at its easy resistance barrier in traction until all restriction has released – which can take some minutes (Fig. 4.25B).
- According to Upledger, this approach can produce multiple profound releases throughout the cranial mechanism, including the reciprocal tension membranes and sutures.

Method 3

Goodheart (Walther 1988) describes an in-the-mouth approach using SCS principles to treat the internal (most likely to be involved in problems associated with jaw closing) or external (most likely to be involved in jaw opening) pterygoid muscles.

- The patient is supine and the practitioner stands to one side.
- The patient is asked to open the mouth and the practitioner inserts a gloved index finger (caudad hand) which palpates beyond the last molar on the side on which she is standing (Fig. 4.26).
- The practitioner monitors the pain in the pterygoid muscle area with the index finger.
- The primary spinal motion for obtaining reduced tenderness in the pterygoid muscle is head and neck hyperflexion, with some lateral flexion and rotation.
- The position is changed until the maximum amount of pain is reduced in the pterygoid muscle.
- The patient remains passive while the head and neck are maneuvered to obtain the relief.
- When the optimal position is reached the patient takes a deep inspiration and holds it as long as possible.
- The practitioner holds the position for 30 or more seconds and then slowly and passively maneuvers the patient back to neutral.
- Re-evaluation is then performed, using digital pressure on the muscle.

These examples indicate the versatility and some of the variations of the application of osteopathic manipulative treatment, which in all instances incorporate positional release methods being used in a variety of ways, based on the needs of the particular condition and patient.

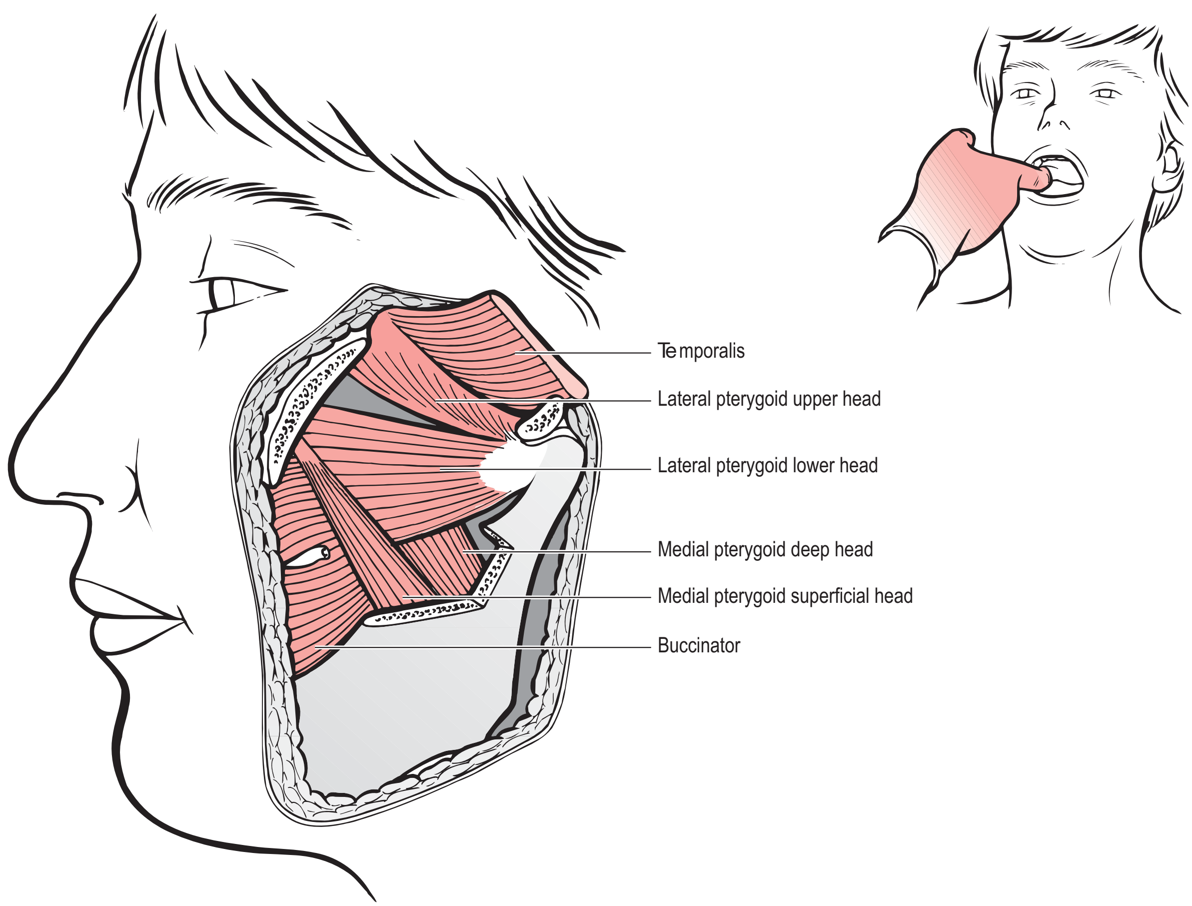

Figure 4.26 The pterygoid muscles, and hand position for palpating these on the right side. (From Chaitow 1999.)

References

Breig A 1978 Adverse mechanical tension in the CNS. John Wiley, New York

Chaitow L 1999 Cranial manipulation: theory and practice. Churchill Livingstone, Edinburgh

Chaitow L 2001 Muscle energy techniques, 2nd edn. Churchill Livingstone, Edinburgh

Cummings J, Howell J 1990 The role of respiration in the tension production of myofascial tissues. Journal of the American Osteopathic Association 90(9): 842

D'Ambrogio K, Roth G 1997 Positional release therapy. Mosby, St Louis

Dickey J 1989 Postoperative osteopathic manipulative management of median sternotomy patients. Journal of the American Osteopathic Association 89(10): 1309–1322

Frymann V 1971 A study of the rhythmic motions of the living cranium. Journal of the American Osteopathic Association 70: 828–945

Goodheart G 1984 Applied kinesiology – 1982 workshop procedure manual, 20th edn. Privately published, Detroit

Goodheart G 1985 Applied kinesiology – 1985 workshop procedure manual, 21st edn. Privately published, Detroit

Greenman P 1989 Principles of manual medicine. Williams & Wilkins, Baltimore

Heisey S, Adams T 1993 Role of cranial bone mobility in cranial compliance. Neurosurgery 33(5): 869–877

Illi F 1951 The vertebral column. National College of Chiropractic, Chicago

Jones L 1981 Strain and counterstrain. American Academy of Applied Osteopathy, Colorado Springs

Kimberly P (ed.) 1980 Outline of osteopathic manipulative procedures. Kirksville College of Osteopathic Medicine, Kirksville, MO

Kisselkova G 1976 Applied Physiology 46: 1093–1095

Korr I 1975 Proprioceptors and somatic dysfunction. Journal of the American Osteopathic Association 74: 638–650

Lewandoski M, Drasby E, Morgan M, Zanakis M F 1996 Kinematic system demonstrates cranial bone movement about the cranial sutures. Journal of the American Osteopathic Association 96(9): 551

Lewit K 1999 Manipulative therapy in rehabilitation of the locomotor system. Butterworths, London

McPartland J 1996 Side effects from cranial treatment. Journal of Bodywork and Movement Therapies 1(1): 2–5

McPartland J M, Mein J 1997 Entrainment and the cranial rhythmic impulse. Alternative Therapies in Health and Medicine 3: 40–45

Magoun H 1976 Osteopathy in the cranial field. Journal Printing Co, Kirksville, MO

Marmarou A, Shulman K, LaMorgese J 1975 Compartmental analysis of compliance and outflow resistance of CSF system. Journal of Neurosurgery 43: 523–534

Morrison M 1969 Lecture notes. Seminar, September 1969 at Charing Cross Hotel, London

Moskalenko V et al 1961 Cerebral pulsation in the closed cranial cavity. Izvestiia Academii Nauk Biologicheskaia 4: 620–629

Nicholas A, Oleski S 2002 Osteopathic manipulative treatment for postoperative pain. Journal of the American Osteopathic Association 102(9): Suppl 3

Noll D, Shores J, Gamber R 2000 Benefits of osteopathic manipulative treatment for hospitalized elderly patients with pneumonia. Journal of the American Osteopathic Association 100(12): 776–782

Owens C 1982 An endocrine interpretation of Chapman's reflexes. American Academy of Osteopathy, Newark, OH

Peck D, Buxton D F, Nitz A A 1984 Comparison of spindle concentrations in large and small muscles acting in parallel combinations. Journal of Morphology 180: 243–252

Pick M 1999 Cranial sutures. Eastland Press, Seattle

Radjieski J, Lumley M, Cantieri M 1998 Effect of osteopathic manipulative treatment on length of stay for pancreatitis: a randomized pilot study. Journal of the American Osteopathic Association 98(5): 264–272

Scariati P 1991 In: DiGiovanna E (ed.) An osteopathic approach to diagnosis and treatment. Lippincott, London

Schwartz H 1986 The use of counterstrain in an acutely ill in-hospital population. Journal of the American Osteopathic Association 86(7): 433–442

Stiles E 1976 Osteopathic manipulation in a hospital environment. Journal of the American Osteopathic Association 76: 243–258

Sutherland W 1939 The cranial bowl. Privately published, Mankato, MN

Travell J 1949 Basis for multiple use of local block of somatic areas. Mississippi Valley Medical Journal 71: 13–21

Upledger J 1984 Cranial sacral therapy. Eastland Press, Seattle

Upledger J, Vredevoogd J 1983 Craniosacral therapy. Eastland Press, Seattle

Upledger J et al 1979 Strain plethysmography and the cranial rhythm. Proceedings XIIth International Conference in Medicine and Biology, Jerusalem

Walther P 1988 Applied kinesiology synopsis. Systems DC, Pueblo, CO

Williams P, Warwick R 1980 Gray's anatomy. W B Saunders, Philadelphia

Zanakis N 1996 Studies of CRI in man using a tilt table. Journal of the American Osteopathic Association (96)9: 552

Zink G, Lawson W B 1979 An osteopathic structural examination and functional interpretation of the soma. Osteopathic Annals 7: 12–19.