Chapter 3

How much pain is there, where is it and where might it be coming from?

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TRIGGER POINTS

Pain in the back can frequently be the result of referred pain from active myofascial trigger points (TrPs), and the maps in Figure 3.1A–I can help to identify where these might be located.

Working backwards from the site of the pain, it is a simple matter to identify the probable location of the trigger point(s) that may be feeding pain into the distressed tissues (Simons et al 1999).

Definitions of active and latent trigger points are found in Box 3.1.

TRIGGER POINT PALPATION SITES

Raymond Nimmo (1957), a pioneer of the early years of research into trigger points compiled useful information as to where to palpate for trigger points referring to specific areas:

- 'Firm pressure on the superior border of the sacrum, between the iliac spine and the sacral spinous process, produces pressure on the SI ligament. Move the contact superiorly and inferiorly searching for sensitivity' (Nimmo 1966).

Triggers here are involved in all low back syndromes and 50% of all patients, according to Nimmo.

As in all descriptions given (below), it is suggested that you search both sides.

- Press just superiorly to the sacral base adjacent to the spine, medial to PSIS. This is the iliolumbar ligament. Heavy pressure is required to find triggers which are involved in most low back problems.

Search both sides. A 90% incidence is reported.

- Hook your thumb under the sacrosciatic and sacrotuberous ligaments medial and inferior to the ischial tuberosity, lifting and stretching laterally if painful.

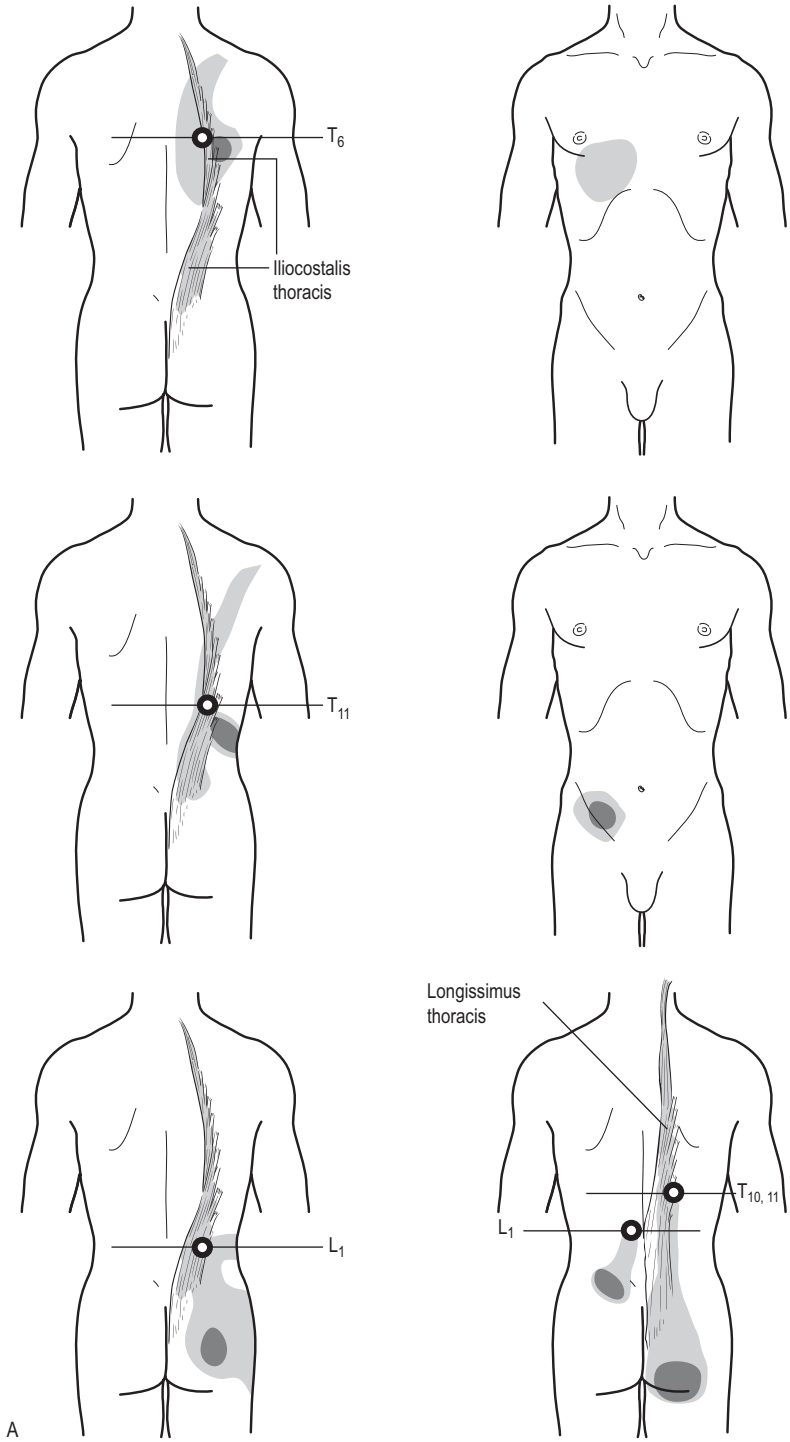
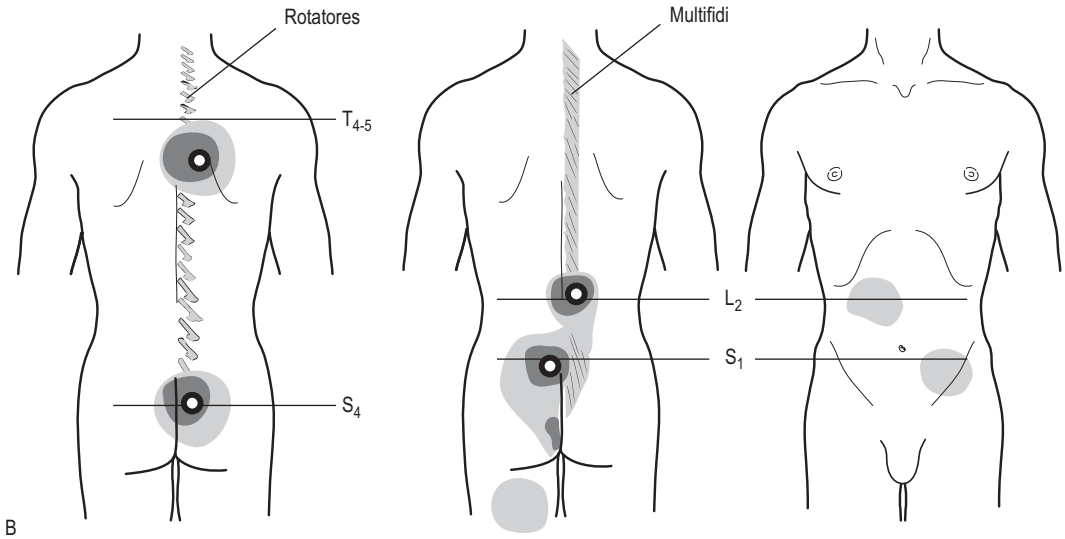


Figure 3.1 (A) Superficial paraspinal muscles collectively known as erector spinae have combined target zones which refer across most of the posterior surface of the body and anteriorly as well. (From Chaitow and DeLany 2000.)



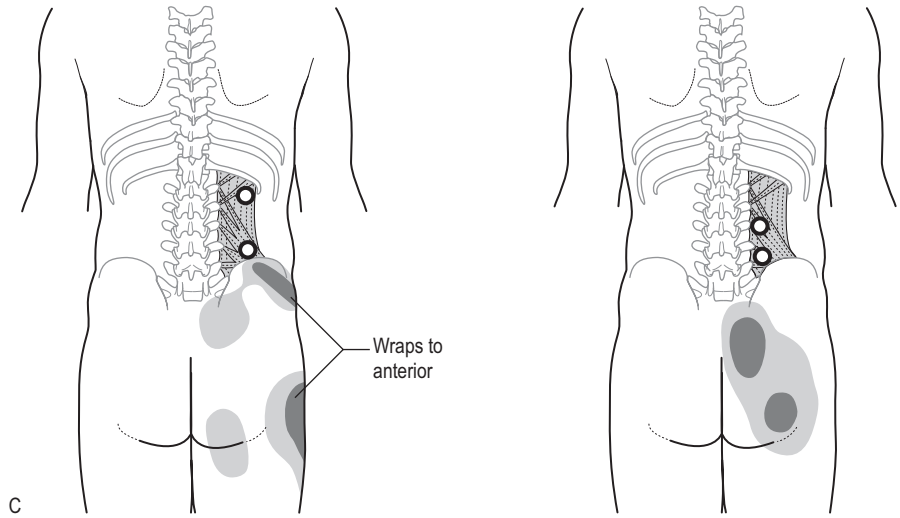


Figure 3.1, cont'd (B) Composite trigger point referral patterns of multifidi and rotators. (From Chaitow and DeLany 2000.) (C) Quadratus lumborum trigger points refer into SI joint, lower buttocks and wrap laterally along the iliac crest and hip region. A referral pattern into the lower abdomen region is not illustrated. (Adapted from Travell and Simons (1992), Fig. 4.1A, B.) (From Chaitow and DeLany 2002.)

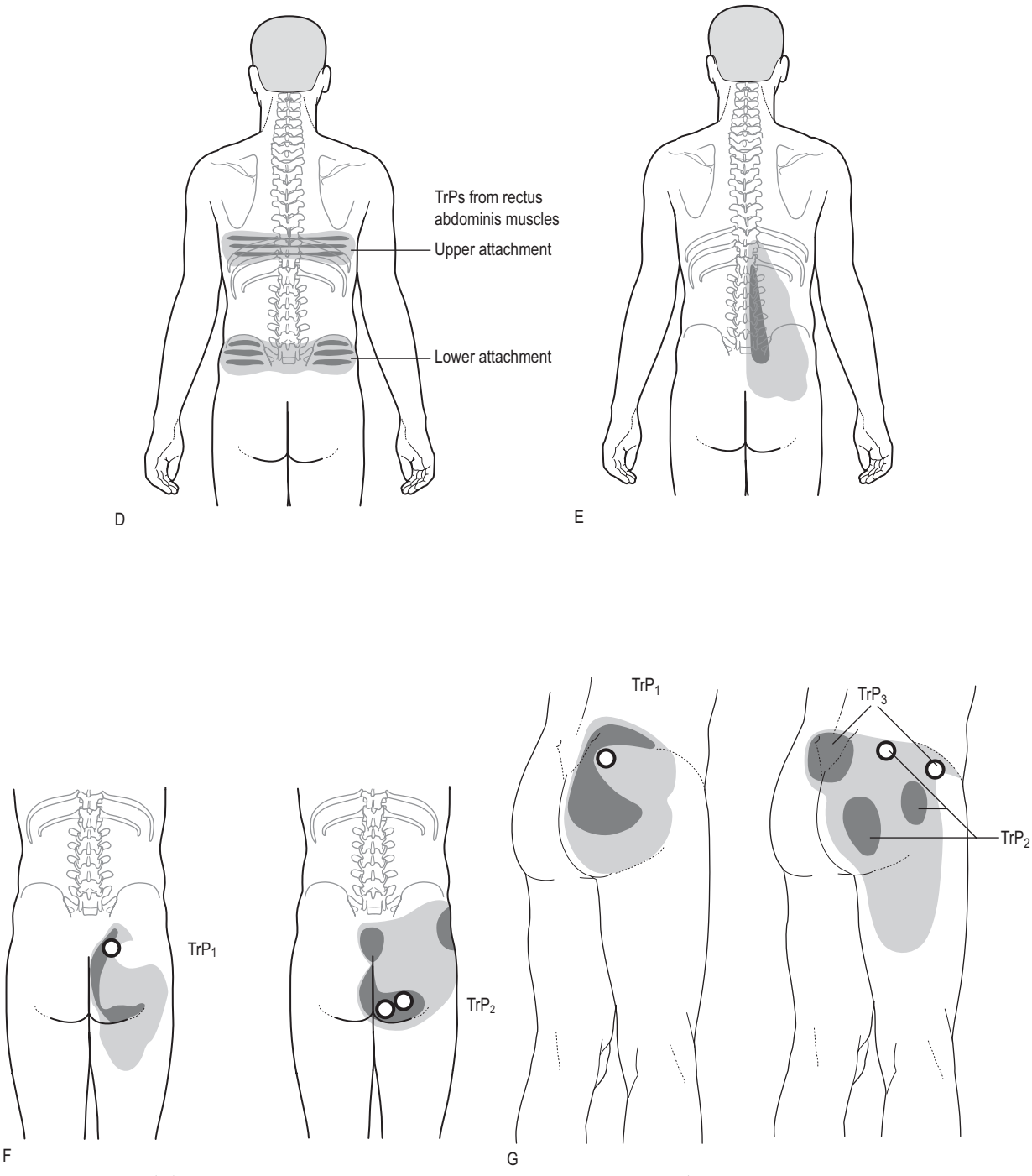
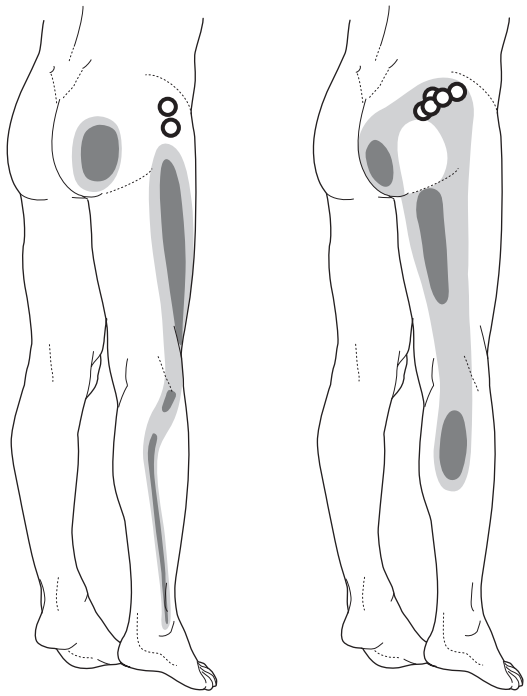


Figure 3.1, cont'd (D) Trigger point in rectus abdominis can refer posteriorly into the back. (Adapted with permission from Travell and Simons (1992).) (From Chaitow and DeLany 2002.) (E) Referral pattern for iliopsoas may continue further than illustrated into the sacrum and proximal medial buttocks. Additionally, it may refer into the upper anterior thigh (not illustrated). (Adapted with permission from Travell and Simons (1992).) (From Chaitow and DeLany 2002.) (F) The referred patterns of the gluteus maximus include the sacroiliac joint, sacrum, hip, ischium and coccyx. They can be the source of low backache, lumbago and coccygodynia. (Adapted with permission from Travell and Simons (1992).) (From Chaitow and DeLany 2002.) (G) Target referral zones for gluteus medius trigger points. (Adapted with permission from Travell and Simons (1992).) (From Chaitow and DeLany 2002.)



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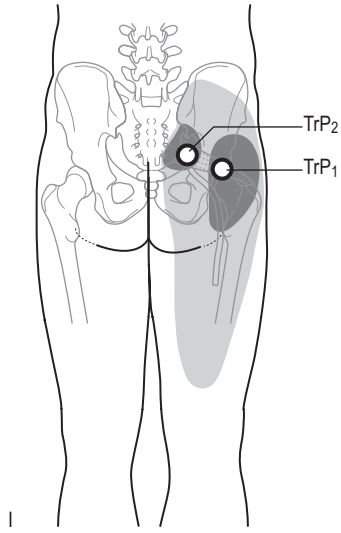

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Figure 3.1, cont'd (H) The 'pseudo-sciatica' referral patterns for gluteus minimus trigger points (From Chaitow and DeLany 2002.) (I) Awareness of the course of the sciatic nerve should be ever present on the practitioner's mind as examination of this region takes place. Target zone of referral of piriformis is also shown. (Adapted with permission from Travell & Simons 1992.) (From Chaitow and DeLany 2002.)

Nimmo reports a 30% incidence of triggers in these sites.

Note: Nimmo used a palm-held, rubber-tipped wooden T-bar, in order to apply pressure to areas requiring high poundage, such as the iliolumbar ligament.

- Medial pressure is applied by the thumb to the lateral border of quadratus lumborum, avoiding pressure on the tips of transverse processes, starting below the last rib down to the pelvic rim. A 'gummy' feel will be noted if contracture exists (plus sensitivity) in contrast to the resilient, homogeneous feel of normal muscle. Triggers here are often associated with low back problems. If latissimus dorsi is also involved, pain may radiate to the shoulder or arm.

An 80% incidence of trigger point activity is reported in these muscles, according to Nimmo's research.

- Search the area below the posterior aspect of the ilia for noxious points associated with gluteal muscles generally
- Search the central region of the belly of gluteus medius for triggers which can produce sciatic-type pain.

A 90% incidence is reported.

- Search midway between the trochanters and the superior crest of the ilium, in the central portion of gluteus minimus where a trigger point affecting the lateral aspect of, e.g. the foot, or duplicating sciatic-type pain, is common.

This also has a 90% incidence of triggers, as opposed to gluteus maximus, which produces active triggers in only 4% of patients with back pain.

- The point of intersection, where imaginary lines drawn from the posterior superior iliac spine (PSIS) to the trochanter, and from the ischial tuberosity to the anterior superior iliac spine (ASIS) meet, is the access point for contact with the insertion of the piriformis muscle
- If the line from the ASIS is taken to the coccyx, the intersection is over the belly of the piriformis. These two points should be palpated; if sensitivity is noted, the muscle requires treatment. Sciatic-type pain distribution to the knee is a common referred symptom.

A 40% incidence of triggers is reported by Nimmo.

- Hamstring trigger points lie about a hand's width above the knee joint in about 20% of patients
- With the supine patient's knees flexed, the therapist stands on the side to be examined. Place finger pads

Box 3.1 Active and latent trigger points

The pain characteristics of an active myofascial trigger point are:

- When pressure is applied, active trigger points are painful and either refer (i.e. symptoms are felt at a distance from the point of pressure) or radiate (i.e. symptoms spread from the point of pressure)
- Symptoms that are referred or that radiate include pain, tingling, numbness, burning, itching or other sensations, and most importantly, in an active trigger these symptoms are recognizable (familiar) to the person.

There are other signs of an active trigger point ('jump sign', palpable indications such as a taut band, fasciculation etc.).

The pain characteristics of a latent myofascial trigger point are:

- Commonly, the individual is not aware of the existence of a latent point until it is pressed (that is, unlike an active point, a latent one seldom produces spontaneous pain)
- When pressure is applied to a latent point it is usually painful, and it may refer (i.e. symptoms are felt at a distance from the point of pressure), or radiate (i.e. symptoms spread from the point of pressure)
- If the symptoms, whether pain, tingling, numbness, burning, itching or other sensations, are not familiar, or perhaps are sensations that the person used to have in the past, but has not experienced recently, then this is a latent myofascial trigger point.

Progression

Latent trigger points may become active trigger points at any time, perhaps becoming a 'common, everyday headache' or adding to, or expanding, the pattern of pain already being experienced for other reasons.

The change from latent to active may occur when the tissues are overused, strained by overload, chilled, stretched (particularly if this is rapid), shortened, traumatized (as in a motor vehicle accident or a fall or blow) or when other perpetuating factors (such as poor nutrition or shallow breathing) provide less than optimal conditions of tissue health.

Active trigger points may become latent trigger points with their referral patterns subsiding for brief or prolonged periods of time. They may then be reactivated with their referral patterns returning for no apparent reason.

Embryonic points

Any sensitive point in the soft tissues, that hurts unusually on pressure, but which does not radiate or refer, is termed an embryonic trigger point.

This is a disturbed or dysfunctional region of soft tissue that, over time, with sufficient additional stress input (overuse etc.), may become first a latent, and eventually, an active trigger point.

Attachment and central points

When a trigger point is situated near the center (belly) of a muscle, near the motor end-point, it is known as a central point. When it is situated close to the insertion/attachment of a muscle, it is known as an attachment point.

just superior to the ASIS, pressing towards the floor and then towards the feet, allowing access under the pelvic crest to contact the iliacus muscle. A gliding contact, followed by flexing of the contact fingers allows searching of this area for triggers.

A 90% incidence of triggers is reported by Nimmo.

- Access to the psoas muscle is suggested from the lateral margin of rectus abdominis, allowing finger contact to pass under the sigmoid on the left, and under the caecum on the right. This accesses the belly of psoas in non-obese patients. Another access is directly towards the spine from the midline (patient with flexed knees), some 7.5 cm below the umbilicus. On approaching the spine (denser feel), finger pad contact slides laterally over the body of the lumbar vertebrae (2, 3 or 4) towards the opposite side. This will contact the origin of psoas, a common site for triggers.

A 50–70% incidence of triggers is reported by Nimmo.

- Abductor longus and pectineus can be contacted with the patient in the same position, as thumbs glide along the abductor towards pubic attachment and then laterally to contact pectineus.

An incidence of 50% of patients have triggers in this muscle.

- Tensor fascia lata is best contacted with the patient side-lying, affected leg straight, supported by the flexed other leg. Triggers here can produce sciatic-type pain.

A 70% incidence of triggers is reported by Nimmo.

VISCERA AND BACK PAIN

We have seen in the previous chapter that impostor pain exists, sometimes arising in visceral organs and referring to the back. Refer back to Figure 2.3 for a

sense of just how important it is for the patient (and for you) for an accurate diagnosis to be made. You should never feel embarrassed to say to the patient that you want to be certain of the cause before starting treatment, and then to refer the patient to someone licensed to make that diagnosis. Your professionalism will be respected, and once you have the diagnosis, you will have the confidence to commence treatment with a reassured patient.

PELVIC PAIN

Pelvic pain, and problems of urgency and incontinence, may also at times be related to trigger points, although of course there may be many other causes of these symptoms, including infection, gynecological disease, pregnancy, weight problems, etc. Since the early 1950s there have been reports that symptoms such as cystitis could be created by trigger points in the abdominal muscles (Kelsey 1951). Travell & Simons (1983), the leading researchers into trigger points, reported that:

> Urinary frequency, urinary urgency and 'kidney' pain may be referred from trigger points in the skin of the lower abdominal muscles. Injection of an old appendectomy scar … has relieved frequency and urgency, and increased the bladder capacity significantly.

More recent research confirms this, and has shown that symptoms such as cystitis can often be relieved manually, as well as by injection (Oyama et al 2004, Weiss 2001).

MEASURING THE PAIN

Wolfe et al (1995) showed that although approximately 60% of women can tolerate 4 kg (±8 lbs) of pressure before reporting pain, approximately 90% of men can tolerate this amount of pressure without feeling what they would describe as pain. Less than 5% of women can tolerate 12 kg (±25 lbs) of pressure, while nearly 50% of men can do so. This gender difference is well worth remembering when using pressure to test pain levels.

It is important to have ways of easily recording the person's present sense of pain (Melzack & Katz 1999), so that there is a record that can be compared with treatment progress.

You need to know:

- where the pain is
- what it feels like to the patient (words such as ache, sharp, burning, etc.)
- what other symptoms (inflammation for example, or a fever) accompany the pain
- whether any of the symptoms are constant or fluctuating
- what aggravates the pain and what makes it easier
- the times of day when pain is most obvious (In bed at night? When moving about? After moving about and sitting?)
- what activities are prevented by the pain ('I cannot (or it is difficult to) walk, sit down, carry anything', etc.).

Tools for measuring pain

There are a variety of 'tools' that can help to record symptoms such as pain, ranging from questionnaires, to simple paper based measuring scales, as well as instruments such as a pressure gauge, an algometer.

There are various types of algometer. Some are simple spring-loaded, hand-held devices, while others use digital technology. Algometers are discussed further below.

Rating scales (Fig. 3.2A–C)

The simplest measuring device, the verbal rating scale (VRS) (Fig. 3.2A), records on paper, or a computer, what a patient reports, i.e. whether there is 'no pain', 'mild pain', 'moderate pain', 'severe pain' or 'agonizing pain' (Jensen & Karoly 1991).

A numerical rating scale (NRS) This method uses a series of numbers (0–100, or 0–10)

- No pain would equal 0
- Worst pain possible would equal the highest number on the scale.

The patient is asked to apply a numerical value to the pain. This is recorded along with the date.

Using an NRS (Fig. 3.2B), is a common and fairly accurate method for measuring the intensity of pain, but does not take account of the 'meaning' the patient gives to the pain (Hong et al 1996).

The visual analogue scale (VAS) This widely used method consists of a 10 cm line drawn on paper, with marks at each end, and at each cm.

- The 0 end of the line equals no pain at all
- The 10 cm end equals the worst pain possible.

The patient marks the line at the level of their pain. The VAS (Fig. 3.2C), can be used to measure progress by comparing the pain scores over time. The VAS has been found to be accurate when used for anyone over the age of 5 years.

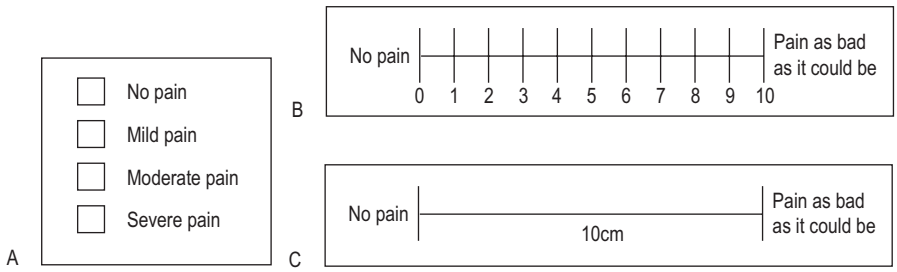


Figure 3.2 (A) A verbal rating scale. The patient is instructed to mark the verbal description that best represents their pain. (B) A numerical rating scale. The patient is instructed to mark the numbered vertical line as appropriate. (C) A horizontal visual analogue scale for pain intensity. (After Kolt and Andersen 2004.)

Questionnaires

A variety of questionnaires exist, such as the McGill Pain Questionnaire (Fig. 3.3), the Short McGill Questionnaire, and many others. The shorter version lists a number of words that describe pain (such as throbbing, shooting, stabbing, heavy, sickening, fearful). The use of such questionnaires requires training so that accurate interpretation can be made of the patient's answers, therefore, apart from acknowledging that they can be very useful, the McGill (and other) questionnaires will not be discussed in this book. There are a number of ways of getting further information, the simplest being to conduct a web-search using the 'McGill questionnaire' for the keywords.

Pain drawings

It can be useful for the patient to color the areas of their pain on a simple outline of the human body, using a red pencil (Fig. 3.4A).

The patient should write single word descriptions of the pain in different areas: throbbing, aching, etc., or a simple code can be used, for example:

- xx = burning pain
- !! = stabbing pain
- 00 = aching, and so on.

This records both the location, and the nature, of the person's pain, and can be compared with similar records at future visits.

The shaded or colored areas can be very useful when searching for trigger points, in combination with the body maps provided earlier in this chapter.

A single sheet of paper can easily contain a VAS, a shortened McGill Questionnaire, as well as a series of simple questions such as those illustrated in Figure 3.4B.

Pain threshold

Applying pressure safely requires sensitivity. We need to be able to sense when tissue tension/resistance is being 'met', as we palpate, and when tension is being overcome.

When applying pressure you may ask the patient: 'Does it hurt?', 'Does it refer?' To make sense of the answer it is important to have an idea of how much pressure you are using.

The term 'pain threshold' is used to describe the least amount of pressure needed to produce a report of pain, and/or referred symptoms, when a trigger point is being compressed (Fryer & Hodgson 2005).

It is important to know how much pressure is required to produce pain, and/or referred symptoms, and whether the amount of pressure being used has changed after treatment, or whether the pain threshold is different the next time the patient comes for treatment.

It would not be helpful to hear: 'Yes it still hurts' only because you are pressing much harder!

When testing for trigger point activity, we should be able to apply a moderate amount of force, just enough to cause no more than a sense of pressure (not pain) in normal tissues, and to be always able to apply the same amount of effort whenever we test in this way. We should be able to apply enough pressure to produce the trigger point referral pain, and know that the same pressure, after treatment, no longer causes pain referral.

How can a person learn to apply a particular amount of pressure, and no more?

It has been shown that, using a simple technology (such as bathroom scales), physical therapy students can be taught to accurately produce specific degrees of pressure on request. Students are tested applying

McGill Pain Questionnaire

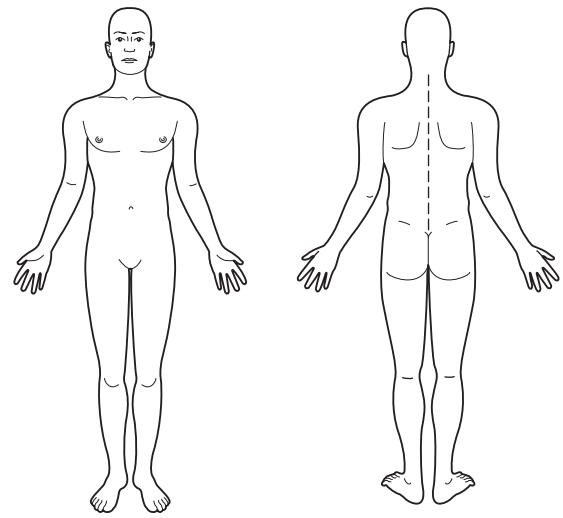
Patient's name _____ Date _____ Time _____ am/pm

PRI: S _____ A _____ E _____ M _____ PRI(T) _____ PPI _____

(1–10) (11–15) (16) (17–20) (1–20)

1 FLICKERING	11 TIRING	
QUIVERING	EXHAUSTING	
PULSING	12 SICKENING	
THROBBING	SUFFOCATING	
BEATING	13 FEARFUL	
POUNDING	FRIGHTFUL	
2 JUMPING	TERRIFYING	
FLASHING	14 PUNISHING	
SHOOTING	GRUELLING	
3 PRICKING	CRUEL	
BORING	VICIOUS	
DRILLING	KILLING	
STABBING	15 WRETCHED	
LANCINATING	BLINDING	
4 SHARP	16 ANNOYING	
CUTTING	TROUBLESOME	
LACERATING	MISERABLE	
5 PINCHING	INTENSE	
PRESSING	UNBEARABLE	
GNAWING	17 SPREADING	
CRAMPING	RADIATING	
CRUSHING	PENETRATING	
6 TUGGING	PIERCING	
PULLING	18 TIGHT	
WRENCHING	NUMB	
7 HOT	DRAWING	
BURNING	SQUEEZING	
SCALDING	TEARING	
SEARING	19 COOL	
8 TINGLING	COLD	
ITCHY	FREEZING	
SMARTING	20 NAGGING	
STINGING	NAUSEATING	
9 DULL	AGONIZING	
SORE	DREADFUL	
HURTING	TORTURING	
ACHING	**PPI**	
HEAVY	0 NO PAIN	
10 TENDER	1 MILD	
TAUT	2 DISCOMFORTING	
RASPING	3 DISTRESSING	
SPLITTING	4 HORRIBLE	
	5 EXCRUCIATING	

BRIEF	RHYTHMIC	CONTINUOUS
MOMENTARY	PERIODIC	STEADY
TRANSIENT	INTERMITTENT	CONSTANT



E = EXTERNAL

I = INTERNAL

COMMENTS:

Figure 3.3 McGill Pain Questionnaire. The rank values for each descriptor fall into four main groups: S, sensory; A, affective; E, evaluative; M, miscellaneous. PRI, pain rating index, is the sum of the rank values; PPI, present pain index, is based on a scale of 0–5 (from Melzack R 1975 Pain, 1, The McGill Pain Questionnaire: Major properties and scoring methods, p 227–299, with permission from the International Society for the Study of Pain).

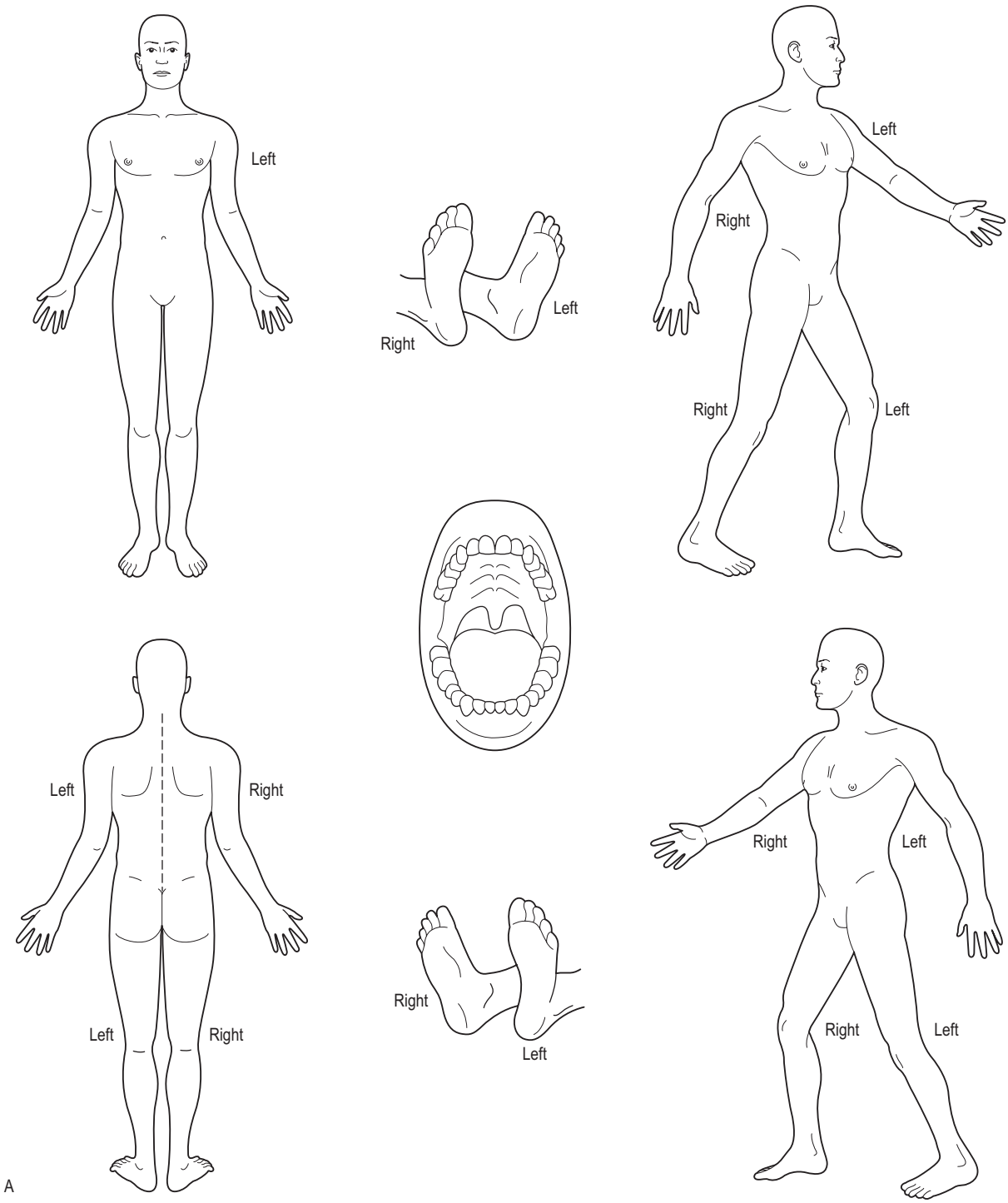


Figure 3.4 (A) Outlines of human body onto which patient sketches patterns of pain.

NAME _____ DATE _____

Please tick any of the words that describe your pain under the column that describes its intensity.

	None	Mild	Moderate	Severe
Throbbing				
Shooting				
Stabbing				
Cramping				
Gnawing				
Hot-Burning				
Aching				
Heavy				
Tender				
Splitting				
Tiring-Exhausting				
Sickening				
Fearful				
Punishing-Cruel				

Your Pain is:

On Most Days ..... No Pain Mild
Discomforting Distressing
Horrible Excruciating

At Its Worst ..... No Pain Mild
Discomforting Distressing
Horrible Excruciating

At Its Best ..... No Pain Mild
Discomforting Distressing
Horrible Excruciating

TODAY No Pain Mild
Discomforting Distressing
Horrible Excruciating

How many hours of the day are you in pain? .....
How many days per week are you in pain? .....
How many weeks per year are you in pain? .....
What Drugs Have You Taken Today? .....

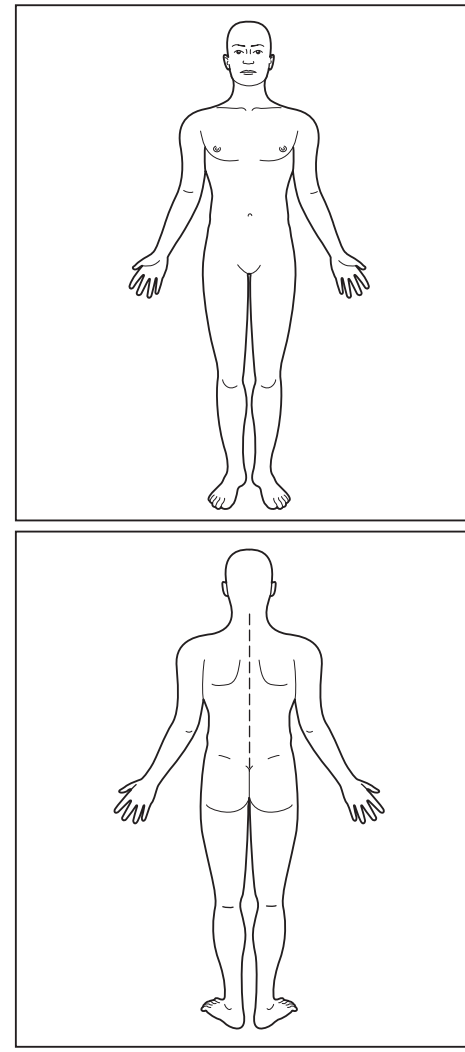
.....

Your Pain Today - Tick along scale below

No Pain [_____**] Worst Possible Pain**

PLEASE DRAW YOUR PAIN

xxx	Burning	= =	Numbness
!!	Stabbing	**	Cramping
oo	Aching	?	Other



B

Figure 3.4, cont'd (B) Pain chart for gathering descriptive terms from the patient, and for sketching pain patterns. (From Chaitow and Fritz 2006.)

pressure to lumbar muscles. After training, using bathroom scales, the students can usually apply precise amounts of pressure on request (Keating et al 1993).

Algometer

A basic algometer is a hand-held, spring-loaded, rubber-tipped, pressure-measuring device, that offers a means of achieving standardized pressure application. Using an algometer, sufficient pressure to produce pain is applied to preselected points, at a precise 90° angle to the skin. The measurement is taken when pain is reported.

An electronic version of this type of algometer allows recording of pressures applied, however these forms of algometer are used independently of actual treatment, to obtain feedback from the patient, to register the pressure being used when pain levels reach tolerance (see Fig. 3.5A,B).

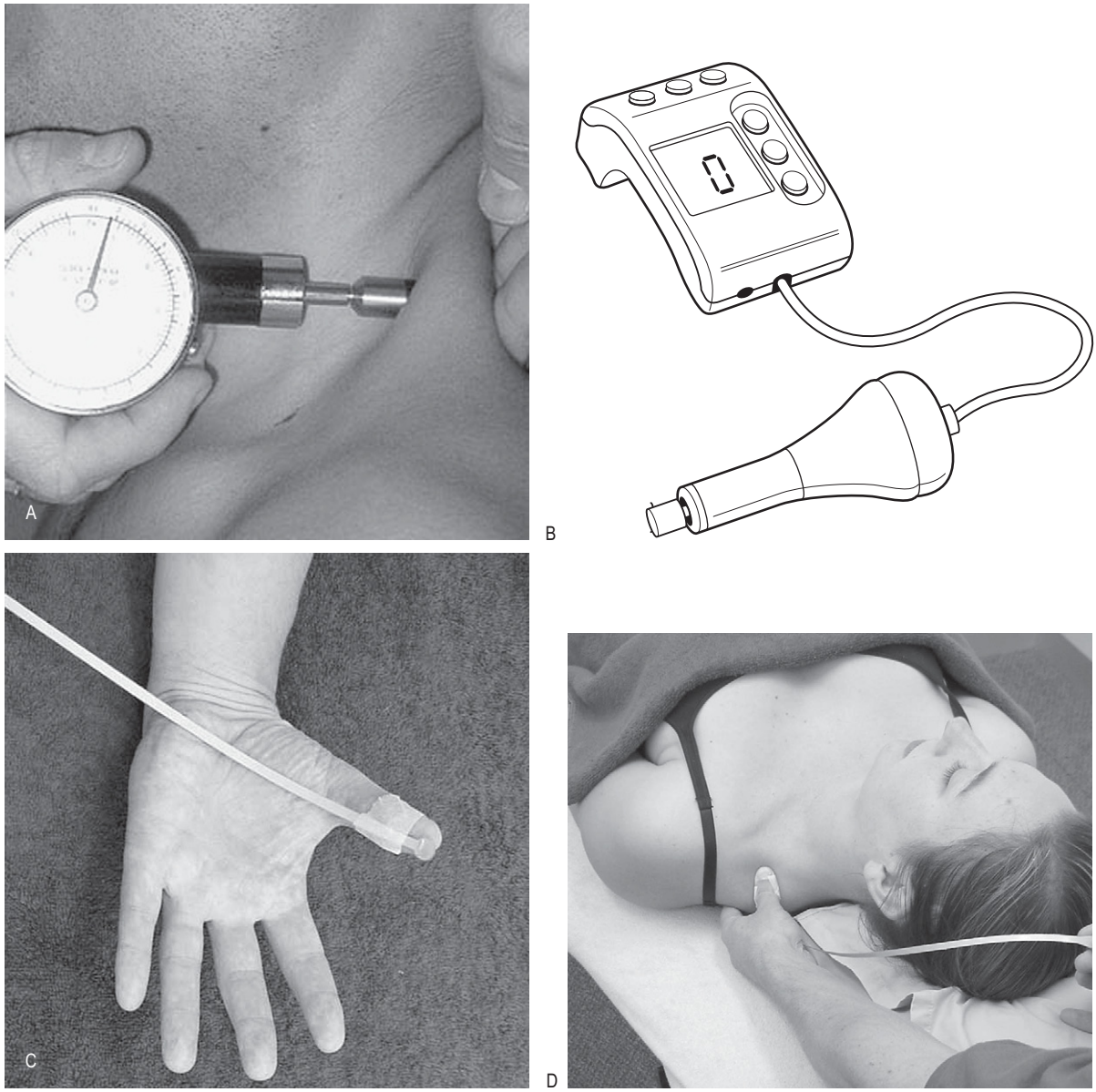


Figure 3.5 (A) Mechanical pressure algometer being used to measure applied pressure. (B) A version of an electronic algometer. (C) Electronic algometer pressure pad attached to thumb (and to computer). (D) Electronic algometer being used to evaluate pressure being applied to upper trapezius trigger point. (From Chaitow and Fritz 2006.)

A variety of other algometer designs exist, including a sophisticated version that is attached to the thumb or finger, with a lead running to an electronic sensor that is itself connected to a computer. This gives very precise readouts of the amount of pressure being applied by the finger or thumb during treatment (Fig. 3.5C,D)

Baldry (1993) suggests that algometers should be used to measure the degree of pressure required to produce symptoms, 'before and after deactivation of a trigger point, because when treatment is successful, the pressure threshold over the trigger point increases'.

If an algometer is not available, and in order to encourage only appropriate amounts of pressure being applied, it may be useful to practice simple palpation exercises such as those described below.

TISSUE 'LEVELS'

Palpation exercise

Pick (1999) has useful suggestions regarding the levels of tissue that you should try to reach by application of pressure, to be used in assessment and treatment. He describes the different levels of tissues you should be aiming for as follows.

Surface level

This is the first contact, molding to the contours of the structure, no actual pressure. This is just touching, without any pressure at all and is used to start treatment via the skin.

Working level

'The working level' is the level at which most manipulative procedures begin. Within this level, the practitioner can feel pliable counter-resistance to the applied force. The contact feels non-invasive and is usually well within the comfort zone of the subjects. Here the practitioner will find maximum control over the intracranial structures (Fig. 3.6).

Rejection levels

Pick suggests these levels are reached when tissue resistance is overcome, and discomfort/pain is reported. Rejection will occur at different degrees of pressure, in different areas and in different circumstances.

So how much pressure should be used?

1 *When working with the skin*: Surface level
2 *When palpating for trigger points*: Working level
3 *When testing for pain responses, and when treating trigger points*: Rejection level.

When you are at this rejection level, there is a feeling of the tissues pushing you away, you have to overcome the resistance to achieve a sustained compression.

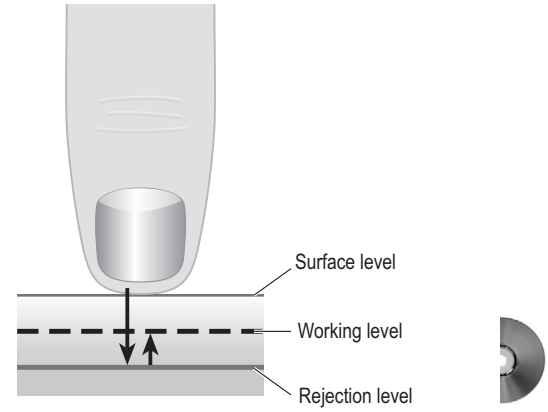


Figure 3.6 The concept of a 'working level'. Surface level involves touch without any pressure at all. Rejection level is where pressure meets a sense of the tissues 'pushing back' defensively. By reducing pressure slightly from the rejection level, the contact arrives at the working level, where perception of tissue change should be keenest, as well as there being an ability to distinguish normal from abnormal tissue (hypertonic, fibrotic, edematous, etc.) (After Dr Marc Pick DC 1999.) (From Chaitow 2005.)

KEY POINTS

- It is useful to have a record of the level of a patient's pain from the first visit, so that comparisons can be made over time
- There are variety of ways of achieving a record, ranging from simple questions and answers, to use of various scales and questionnaires
- The algometer (pressure gauge) is a tool that provides information as to how much pressure is needed to produce pain
- It is possible to develop sensitive palpation skills that allow a uniform amount of pressure to be used when testing the sensitivity of a patient, or a local point
- Information can and should be recorded so that progress (or no progress) can be measured accurately.

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