

## Chapter 9

# Prevention



### CHAPTER CONTENTS

How vulnerable is the patient?	145
Single leg stance balance test	145
Progressive adaptive changes to soft tissue stressors	147
Upper and lower crossed syndromes	147
The therapist's role	148

If prevention is to be meaningful, then the basic causes of back pain should be avoided. This is, however, not always possible as congenital, in-born, features may be key features of the background to back problems. Additionally, a history of overuse, misuse and abuse (trauma) often accompanied by disuse may be beyond current influence. It is within that context that the present situation needs to be viewed, with as many factors that are capable of removal, improvement, reduction being attended to while at the same time functional improvement is initiated through exercise and therapeutic endeavor (Janda 1984). While there are many treatment methods that have been shown to reduce pain, for prevention of chronic pain, exercise is the proven best choice. Therefore, as soon as possible, self-treatment with exercise should be recommended.

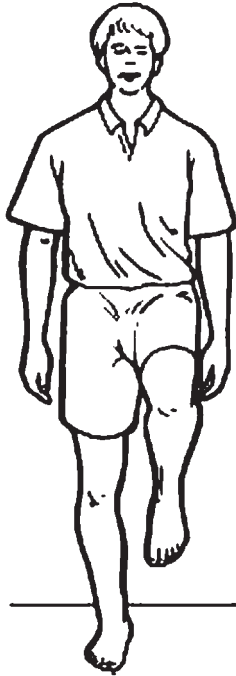
### **HOW VULNERABLE IS THE PATIENT?**

#### **Single leg stance balance test**

This is a reliable procedure (Bohannon et al 1984) for information regarding vulnerability/stability as well as for retraining. Fortunately, it requires no equipment other than a timer (Fig. 9.1).

#### *Procedure*

- The patient is instructed to raise one foot up without touching it to the support leg
- The knee can be raised to any comfortable height
- The patient is asked to balance for up to 30 s with eyes open
- After testing standing on one leg, the other should be tested
- When single leg standing with eyes open is successful for 30 s, the patient is asked to 'spot' something on a wall opposite, and to then close the eyes while visualizing that spot
- An attempt is made to balance for 30 s.



**Figure 9.1** Single-leg stance balance test. (Reproduced from Liebenson CS. Advice for clinician and patient: sensory-motor training. *Journal for Bodywork and Movement Therapies* 5(1):21–28, 2001).

### Scoring

The time is recorded when any of the following occurs:

- The raised foot touches the ground or more than lightly touches the other leg
- The stance foot changes (shifts) position or toes rise
- There is hopping on the stance leg
- The hands touch anything other than the person's own body.

By regularly (daily) practicing this balance exercise, the time achieved in balance with eyes closed will increase. Over time, more challenging balance exercises can be introduced, including the use of wobble boards and balance sandals (Figs 9.2, 9.3).

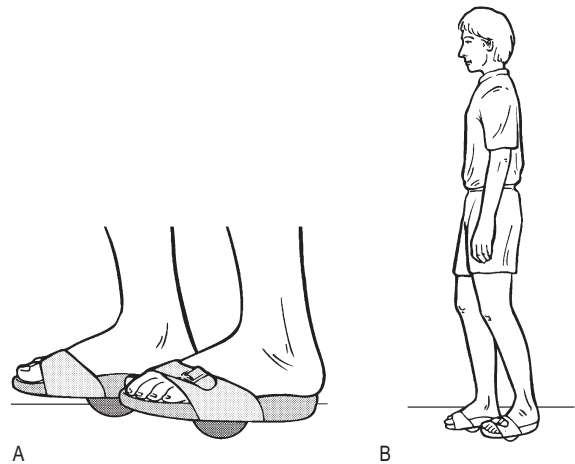
It is important to give patients home exercises to improve the self-management of their musculoskeletal condition. Balance training is very simple to use and requires very little, if any, equipment so it is ideal for self-care.

Regular attendance at tai chi classes/practice will help achieve similar enhanced balance and stability.

The list below highlights some of the key background features that may require attention, or at least awareness.



**Figure 9.2** Wobble board as used in balance retraining (available from OPTP (800) 367 7393 USA). (From Chaitow 2003.)



**Figure 9.3** (A) Balance sandals to assist retraining (available from OPTP (800) 367 7393 USA). (B) Walking on balance sandals. (From Chaitow 2003.)

Possible soft-tissue and joint stressors contributing to back pain:

- Congenital factors, such as short leg, small hemipelvis
- Birth injury, such as cranial trauma from forceps delivery, distorts the internal cranial fascia – tentorium cerebelli and falx cerebri. Because of body-wide fascial continuity, this can cause distortions elsewhere

- Overuse, misuse, or abuse of the musculoskeletal system in work, recreational settings or close environment (chairs, shoes, car seat, etc.)
- Habitual postural stress
- Habitual upper chest breathing pattern
- Trauma: either repetitive minor forms or major incidents
- Reflexive factors, including myofascial trigger points and viscerosomatic influences
- Chronic somatization influences generated by negative psychological and emotional factors and coping traits, including fear, anger, anxiety, depression, etc.
- Biochemical changes resulting from nutritional, toxic, endocrine, infectious and other influences.

With some of the listed ingredients (above) interacting with the unique attributes of the individual, it should be possible to recognize an evolution towards dysfunction as outlined below. If so, the functional and structural changes that are palpable, visible or recognizable through clinical assessment, should be addressed using appropriate manual and movement methods.

The formula to remember is:

- Reduce the adaptive load (reduce or stop doing those things that are adding to compensatory processes: better posture, better use patterns, better breathing, etc.)
- Improve function (mobilize, strengthen, loosen – as appropriate – allowing better handling of adaptive load).

Once these aspects are being addressed, self-regulation (homeostasis) ensures that improvement should follow.

## PROGRESSIVE ADAPTIVE CHANGES TO SOFT TISSUE STRESSORS

Progressive adaptive changes to soft tissue stressors (Digiovanna 1991, Greenman 1996, Janda 1982, Liebenson 1995) are as follows:

- 1 When tissues are stressed an initial 'alarm' response occurs in which tissues become hypertonic and/or painful
- 2 If such changes are other than short term, localized oxygen deficit is probable, together with retention of metabolic waste products, both of which result in discomfort or pain and the likelihood of an increased hypertonic response
- 3 The constant activity of the neural reporting stations in these tissues leads to increased neural sensitization and the development of a tendency to hyperreactivity (known in osteopathic medicine as 'facilitation')

- 4 Macrophages become activated – along with increased vascularity, fibroblast action and connective tissue production – leading to cross-linkage and shortening of tissues
- 5 Changes take place in the muscles as a result of hypertonicity which, if sustained, lead to progressive fibrotic modification
- 6 Sustained hypertonicity produces drag on tendinous attachment to the periosteum and the likelihood of (periosteal) pain and dysfunction in these tissues
- 7 If such stressed tendons or muscles cross joints, they become crowded and their function is modified
- 8 The antagonists of chronically hypertonic muscles are reciprocally inhibited; as a result, normal firing sequences of muscles may alter, e.g. excessive activity of synergist muscles occurs in order to take on the tasks of weakened (inhibited) prime movers, or synergists
- 9 Chronically shortened hypertonic structures have a sustained inhibitory effect on their antagonists
- 10 One example is the short, tight, erector spinae muscles and weakened (inhibited) abdominal muscles seen in the typical 'slouching,' potbellied, sway-back posture ('crossed syndrome', see below)
- 11 Another example is the inhibition of deep neck flexors associated with short tight neck extensor muscles, seen in the typical 'chin-poke' head position
- 12 Posture, breathing and general function becomes less efficient, and energy is wasted in maintaining unnatural levels of tone, with fatigue a natural result.

## UPPER AND LOWER CROSSED SYNDROMES

See Chapter 4 for more on this topic, and also Figure 4.9.

- Chain reactions of these dysfunctional patterns can occur, resulting from the shortening over time of postural muscles (type 1 fibers) and the inhibition and weakening (without shortening) of phasic muscles (type 2 fibers)
- Localized areas of hyperreactivity (facilitation) may evolve paraspinally, or in particular stress-prone regions of any myofascial structures, involving trigger points and other reflexively related changes
- These triggers themselves commonly become sources of pain and of further dysfunction

- Postural and functional changes will become apparent throughout the body, e.g. in relation to breathing pattern dysfunction ('upper chest breathing'), which can result from (for example) poor, slumped posture, and which cannot be easily normalized until the structural changes that encourage it are corrected
- Therapeutic input in response to such changes must address the multiple changes that have occurred, to reduce hypertonicity, resolve fibrotic changes, lengthen shortened structures, tone weakened/inhibited structures, mobilize joints, deactivate trigger points, as well as to remove habitual patterns of use that have added to or caused the dysfunctional patterns, including postural and respiratory re-education
- The musculoskeletal changes described previously may have biomechanical, biochemical, and psycho-

logical components, all of which must be understood and, if possible, modified or removed.

## THE THERAPIST'S ROLE

Your role as a therapist is to advise the patient as to the best way(s) of modifying this downward spiral, with therapy as a means of modifying the effects, and to encourage more normal function ideally through homework/self-management.

Long-term prevention depends on stopping the behaviors that produced the problem in the first place, or on reducing the impact of features that cannot be removed (arthritic changes, unbalanced leg length, for example).

In this context, focus on stress management, sleep and exercise patterns and emotional well-being, all play a major part.

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