

# Physiotherapy and pain

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## Summary

In recent years, traditional physiotherapy philosophies and approaches to pain have been faced with the challenging findings and outcomes of modern pain research. As a result, the profession has begun to embrace wider-reaching and more dynamic models of pain, and started to change its thinking and practice. An example here is how the recent integration of the biopsychosocial model is starting to impact on the way physiotherapists reason and work. In addition, pain research has challenged our interpretation of underlying mechanisms of pain and its origins and causes, as well as the efficacy and mechanisms of the interventions used.

This chapter reviews the development of and current practice in physiotherapy thinking and management of pain. It aims to provide two things: first, a significant background resource for physiotherapists on the current models and trends that physiotherapy leaders in the field of pain treatment and management are using and following; and second, a resource for medical and research colleagues who require a better understanding of where physiotherapy is going and how their local physiotherapist might be thinking and reasoning for patients with pain.

## INTRODUCTION

A great many current recommendations are starting to place *appropriate* physiotherapy and physical reactivation as central to strategies for the prevention of chronic pain-related incapacity (Main et al 2000a) and for the restoration of function in chronic pain disability (Harding & Williams 1995, Stanton-Hicks et al 1998, Watson 2000a). Additionally, physiotherapists in many UK hospitals are acting as extended scope practitioners and being entrusted to work in frontline screening and triaging of patients referred to orthopaedic and rheumatology clinics (Dacr-White et al 1999, Muncey 2002a). Skilled physiotherapists are thus beginning to lead a movement to reduce and ultimately, it is hoped, prevent the unnecessary over-medicalization of common musculoskeletal complaints (Ursin & Eriksen 2001).

In the mid to late 1980s, physiotherapists were encouraged to consider more critically their clinical decision-making or clinical reasoning (e.g. Jones 1987, 1992, Jones et al 1995, Payton 1985, Rothstein & Echternach 1986). In essence, therapists were being asked to think about their thinking, to be more reflective and critical, and to incorporate the best and most relevant biomedical knowledge into clinical decision-making. This was a significant leap from the constrained and usually prescriptive applications of various treatment modalities for pain based on questionable science, tradition, long-established but invalid dogma perpetrated in outdated textbooks, or the largely untested personal rules relating to a specified approach of a therapy 'guru' or decided on by unenthusiastic referring doctors

or specialists. More reliable data from outside physiotherapy's traditional zones of declarative knowledge were starting to be incorporated and making an impact. Physiotherapy wanted autonomy, with the freedom to adapt and choose more appropriately for the patient, and was making headway.

From the early to mid 1990s, small numbers of physiotherapists around the world started to take a great deal of interest in pain research (e.g. Butler 1998, Gifford & Butler 1997, Wittink & Michel 1997, Zusman 1992, 1994) as well as in cognitive-behavioural approaches used in pain management (e.g. Harding 1998a, Harding & Williams 1995). This has resulted in significant and impressive changes for the benefit of patients and to the surprise of many medically trained practitioners and researchers. Physiotherapists are no longer accepting the role of passive treatment applicators but are actively engaged in research and writing about pain and in testing the boundaries of the physiotherapy management potential (see works published in Butler 2000, Gifford 1998a, 2000, 2002a,b, Strong et al 2002, Wittink & Michel 1997).

The physiotherapy 'pain revolution' of the 1990s has chiefly been about empowerment with new knowledge, better explanations, and better reasoning to accompany what we do and try to achieve. It is also about our maturation as we grapple with the challenges it presents, with what we can offer, what we are good at, and how to best offer it. What we require in return from general medicine and pain science is respect and enthusiastic interaction. We have the relative luxury of time, but it needs to be used wisely and efficiently.

Physiotherapists are unique in that they are generally good listeners; take time to understand patients and explain things to them; and, when skilled, can positively empower pain sufferers to adapt, take control of, reconstruct and return their lives to better and more stable states. Physiotherapy is naturally multidimensional.

## THE PROBLEMS OF PAIN RESPONSE AND PASSIVE THERAPY

As in most other specialties, physiotherapy treatment of pain conditions has been largely dominated by a focus on finding a presumed pain source in a specific tissue and targeting it with some form of passively applied therapy. Also, the pain reduction achieved by the therapy is used as a guide to treatment efficacy and as proof of the correct tissue attribution. Hence a hypothesis of a hip source for anterior thigh pain would be confirmed when the pain response to hip movement or loading changed with therapy directed to the hip. Although this clinical logic seems reasonable, some care and rethinking are necessary (e.g. Butler 1998, Main & Watson 1999, Muncey 2000, 2002a, Waddell 1998). Useful points are as follows:

- The approach relies on pain response as an honest indicator of progress and recovery, and it not infrequently requires almost

continuous pain-focusing by the patient. Some have argued that this type of focus on pain, especially in susceptible individuals, may well help imprint the pain centrally (Gifford 1998b, Klaber Moffett 2000) and/or promote pain hypervigilance (Main 1983). Increasing attention to a given event is a fundamental feature of learning and has the potential to increase the perceived intensity of the pain. Further, clinicians need to recognize that responses to manual pain provocation tests can be affected by fear of an adverse outcome or fear of injury (Main & Watson 1999, Watson 2002). In other words, the pain reported may be more a reflection of patient anxiety than of the true state of the tissues.

- The approach tends to be linked to tissue abnormality. A major predictor of reduced function and increased disability relates to patient fear of structural damage, thus creating patients who are described as avoiders (Lethem et al 1983, Vlaeyen & Linton 2000, Zusman 1998). Maintaining a focus on pain and tissue abnormality, i.e. that hurt equates with harm, is cited as a significant barrier to functional recovery and a significant predictor of chronic pain and incapacity.
- Passive therapy, of whatever kind, may be responsible for creating unnecessary dependence on therapists and their treatment, and in so doing reduce the role of the patient in self-management (Clinical Standards Advisory Group 1994, Klaber Moffett 2002a, Waddell 1998). Patient dependence promotes the unhelpful belief that it is the clinician's role to cure the problem, and that the patient has little or no responsibility. Regardless of this criticism, there is evidence that manual or manipulative therapy can play a useful part in the management of some musculoskeletal conditions, for example cervicogenic headache (Jull et al 2002) and the early management of back pain (Clinical Standards Advisory Group 1994, Royal College of General Practice 1996).
- Because of the dominant focus on pain relief, therapists tend to fear or be very cautious about reintroducing some functional movements, the tenet being that function should be avoided until the pain has come adequately under control or been abolished. This thinking embraces the challengeable notion that because pain creates the disability, getting rid of it will resolve the disability. This has been shown to be a dubious paradigm. Many patients freed of pain still remain fearful of normal function (Waddell 1998). Patients will also miss out on the pain-relieving potential of function.
- The pain-dominated, 'in series' or 'only do one technique at a time' approach may well be a major barrier to overcome in physiotherapy training. The importance of maintenance of function if at all possible, or at least an early and graded return of function, has been strongly recommended for the prevention of chronic pain and pain-related incapacity.
- Pain can be influenced or modulated from virtually anywhere. For example, craniosacral therapists reportedly use manual techniques on a patient's skull for low back pain, reflexologists may manipulate the feet for the same disorder, and manual physiotherapists may mobilize joints of the lumbar spine. The point is that just because a therapy directed at a particular tissue changed a pain does not necessarily indicate that the tissue addressed was responsible for the pain.

Given the complexity of triggers that can initiate and sometimes sustain pain, the logic that a hip is responsible for a given pain because treating the hip improved matters needs to be interpreted in the context of the broader presentation.

Despite some of the criticisms above, we believe that passive therapies—the use of touch and exercise, the primary purpose of

which is to alter and relieve pain and in turn assist return of function—still have a useful and often significant role to play. However, the current evidence is not very convincing that individual treatment techniques are effective. This prompts a reconsideration of traditional interpretations, and raises awareness of the importance of multidimensional approaches where pain-focused treatments should be viewed as only one possible part of an ongoing management process.

## THE INTEGRATION OF PAIN MECHANISMS

In the mid to late 1990s, there was quite a surge in the physical therapy membership of the International Association for the Study of Pain, and the first physiotherapy-led pain conference was convened in Australia in 1995 (Shacklock 1995). In the UK, the first physiotherapy special interest group devoted to pain was formed: the Physiotherapy Pain Association (<http://www.ppaonline.co.uk>). The integration of pain science into physiotherapy has provided a welcome and potent springboard to much sounder reasoning, better interventions, and much-improved management strategies.

The following two examples demonstrate how basic science developments have changed and directed thinking and practice in physiotherapy (Gifford & Butler 1997, Zusman 1992, 1994).

First, knowledge that changes within the central nervous system can contribute to pain states. These central changes may amplify modest incoming nociceptor traffic, and can modulate sensory impulse traffic from normal tissues so that it leads to pain. Even more malignantly, it may itself generate nociceptive impulse traffic. Clearly, these central changes have implications for treatment. Traditionally, a flaring pain response was linked to worsening of the tissues, whereas in fact it may simply reflect maladaptive central sensory processing.

A second research finding to have great impact for physiotherapy is that some of the central changes share a similar biology to synaptic events associated with memory, involving early short- and later long-term potentiation. One implication is that, once established, these central changes may become permanent, just as a long-term memory becomes fixed (e.g. Basbaum 1996, Gifford 1998b, Katz & Melzack 1990, Sandkuhler 2000, Zimmermann 2001).

Thus, from just these two issues, there was a realization of the following. First, the whole physical testing ethos that relied on the veracity of a pain response as a reflection of tissue abnormality was undermined. Tissues sensitive to palpation, pain response to physical tests, and the flaring pain response required an expanded interpretation. This had to include a consideration of psychological variables (Waddell et al 1984, Watson 2002).

Second, hurt may not necessarily equate with physical harm or physical abnormality. A pain response may not accurately be localized to the site of damage (Cohen 1995, Gifford 1998b). Many well-informed physiotherapists are now teaching patients with ongoing chronic pain problems that a great deal of their pain and tissue sensitivity is referred pain or pain caused by functional problems with the *processing* of sensory information—that the pain mechanism, or the reason for their pain, is largely a neurogenic one rather than one relating directly to abnormality of their tissues, even though that is where the pain is actually felt. The intention is to provide the patient with knowledge that will help to reduce fear of damage with activity and fear of pain increases, so that physical reactivation can proceed with more confidence. Decreasing fear in this way often provides a significant early step towards facilitating reactivation and return of functional confidence (Vlaeyen & Linton 2000). Decreasing fear and anxiety about pain and damage may also promote a beneficial shift of attention away from the pain (Gifford 1998b).

Third, ongoing pain was unlikely to be easy to cure and most probably likely to stay, or if it did happen to go during treatment it could easily return given the right triggers or cues (Deyo 1993). Thus pain-focused treatments for maladaptive pains may be of limited value in the long term. The result has been a shift towards strategies whose prime objectives are functional recovery alongside patient-centred pain management approaches (Harding 1998a, Harding et al 1998, Main & Spanswick 2000, Wittink & Michel 1997).

Fourth, for the patient such things as focusing on pain, worrying about it, getting frustrated and distressed with it, being unoccupied and resting with it may all be helping to imprint the pain and establish it permanently. It has been suggested that, for some patients, efforts with early management involving focusing on pain, being guided by pain, and the unwitting fear of structural damage may actually be part of creating chronicity (Levine et al 1982, Villemure & Bushnell 2002, Zusman 1997, 1998).

Finally, chronic maladaptive central mechanisms and hence chronic pain may be preventable if effective early pain control and pain management programmes are implemented (Linton 1998, 1999). Physiotherapists involved in the management and rehabilitation of acute musculoskeletal pain conditions have been pleading for early referral, with the potential for quicker reactivation and speedier recovery. It is also noteworthy that many of the proved effects of passive therapies occur at this stage.

Patients with complex chronic pain and incapacity, whose problems have often been denied a fair hearing or been the subject of much scorn and suspicion, are often hugely relieved to meet clinicians who feel comfortable with their presentation; who can explain its characteristics and normalize it in rational, fear-reducing terms; and who can then treat them as normal and real patients. Adequately explaining pain to patients is an important but underestimated skill that needs urgent attention in physiotherapy training (see Butler & Moseley 2003).

## THE INTEGRATION OF FUNCTION AND IMPAIRMENT

A great many patients with one form or other of musculoskeletal pain lose function in some way and can become 'deconditioned' as a result (Main et al 2000b); this needs addressing. Physiotherapy is attempting to move away from a largely inefficient unidimensional focus on pain relief pain response towards function and normal movement in parallel with appropriate pain relief modalities, medications, and pain management.

Movement undertaken with fear and trepidation is likely to result in a great deal of tension or guarding as well as increased attention to pain. Conversely, appropriately guided goal-oriented movement, in which the patient feels in control, is approached in the context of no or little fear can provide a wonderful starting point and focus for recovery. This takes a great deal of skill and the integration of cognitive-behavioural principles. This approach is valid for both acute and chronic pain states (Harding 1998a, Harding & Williams 1995, Klaber Moffett 2002a, Klaber Moffett et al 1999, 2004, Muncey 2002a).

Movement is in some ways the forgotten pain 'modality' that is most relevant to the prevention of disability and unnecessary medicalization (Fig. 40.1) (Waddell 1998, p 252).

In the reasoning strategies devised for physiotherapists, two broad movement-related categories were proposed for consideration in assessment and management (Butler 1998, Gifford 1998c, Jones & Rivett 2004): *activity restriction* (or functional limitation) and *physical impairments*.

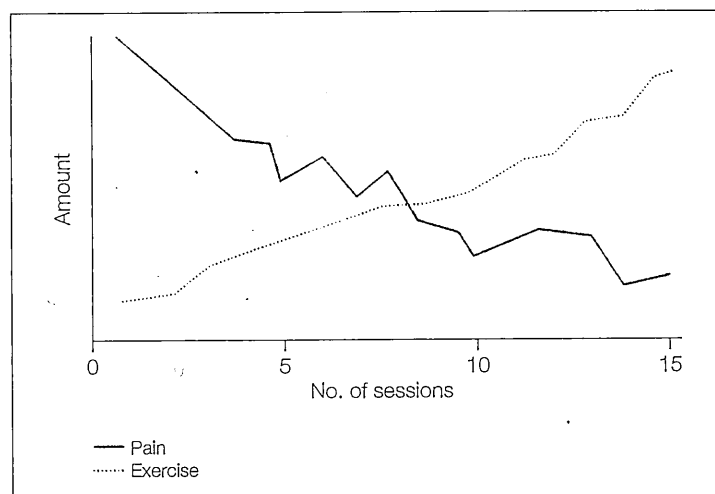


Fig. 40.1 The importance of incremented increases in activity levels. Schematic illustration that, contrary to common belief, increased exercise does not cause increased pain but actually leads to progressive reduction in pain levels. (Adapted with permission from Fordyce et al 1981. Copyright 1981 Elsevier Ltd.)

*Activity restriction* or functional limitation relates to what patients report they are having difficulty with functionally as a result of their pain problem. For example, a patient with a 2-month history of back pain and sciatica may report being unable or unwilling to walk or stand for long, have difficulty getting comfortable lying down and sleeping, or be unable to sit for more than a few minutes before having to move. There are therefore two aspects for consideration: those relating to movement and activity, and those relating to inactivity and resting. Patients often need help with rehabilitation of both.

This category includes the terms *disability* and *participation restriction* in line with the World Health Organization terminology (Jones & Rivett 2004). In addition, therapists are encouraged to consider not only patients' activity and participation restrictions, but also their capabilities (Jones & Rivett 2004). While restrictions will often correlate with patients' goals, understanding their current capabilities is necessary to gain a more complete picture of their pain experience. A patient's capabilities also provide useful insight to where retraining or reactivation may commence. If patients are directed only to those activities they can no longer perform, the result is often continued unsuccessful performance and failure.

The term *physical impairments* relates to the physical signs that the patient may be unaware of until they are revealed during a physical examination. Thus a patient with back pain and sciatica may have the following impairments: restrictions and poor quality of lumbar movements, increased sensitivity of tissues around the spine, increased tone of musculature underlying areas of pain or beyond, a stiff hypomobile hip, loss of confidence in the leg (e.g. difficulty and great effort needed to do a modest step up, and poor single leg balance), muscle imbalance, a weak calf related to modest or minor neuropathy, and a diminished calf reflex.

This common list of findings highlights the many potential impairments that might effectively be addressed in a management programme. This is a massive deviation from traditional approaches to this type of problem, where the therapeutic, surgical or investigative focus is on the problem source in the back and ignores the related impairment and functional consequences.

Note, however, that the dangers of placing too much attention on the correction of physical impairments at the cost of function has

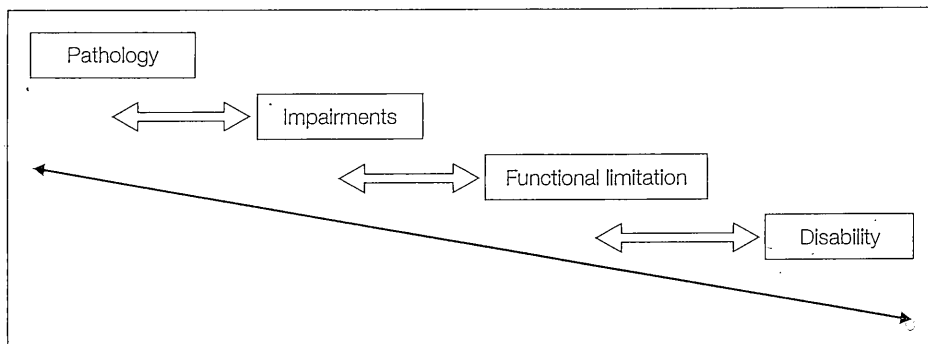


Fig. 40.2 Maureen Simmonds's bidirectional model of disability. (Adapted from Simmonds 2002. Copyright 2002 The International Association for the Study of Pain.)

been highlighted by Simmonds (Simmonds 1999, Simmonds et al 2000), who states:

It is plausible that many altered movement strategies expressed by patients with impairments are actually the most efficient and effective for that patient. For some patients, it may be more important for them to be able to complete a task than to be concerned with how they complete it.

Clearly a skilled and carefully balanced approach to tackling and prioritizing interventions for impairments is required.

Simmonds (2002) has drawn attention to the World Health Organization and Nagi (1991) models of disability, and proposed a bidirectional interrelated component model to best represent the current shifts in management and measurement concepts that apply to musculoskeletal pain (see Fig. 40.2).

The following definitions are recommended (Simmonds et al 2000).

- *Pathology* is defined as a change in the basic structure due to disease or injury. Diagnoses may be made here using imaging or blood tests.
- *Impairment* is defined as per the World Health Organization model, i.e. any loss or abnormality of psychological, physiological or anatomical structure or function. Physical impairment measures, many of which are criticized for being notoriously inaccurate, include ranges of motion, instability, muscle strength, and pain intensity. Measures of anxiety or depression are examples of measures for psychological parameters.
- *Functional limitation* (synonymous with activity restriction) is defined as compromised ability to perform tasks of daily life. For example, walking, sitting down and standing up, climbing stairs,

lifting and kneeling, as well as problems associated with inactivity such as standing, lying and sitting. These are best assessed via a combination of patient self-report and clinician-measured task performance (Simmonds 1999, 2002, Simmonds et al 2000).

- *Disability* (which relates to participation restriction) is defined as an inability to perform an expected role in society. A person who is unable to return to work because of musculoskeletal pain is considered disabled.

What is special about the Simmonds bidirectional model (Simmonds 2002) is the interdependence of each component. For treatment, this means that changes in function can influence disability, impairments and pathology just as changes in pathology may influence in reverse. Feeling comfortable with function and disability influencing impairment and pathology is a major step towards a more open, more rewarding, and multidimensional approach to the clinical pain problems therapists are faced with. Pain, albeit the dominant complaint, is only one part of the problem.

The suggestion here is for tissue mechanisms, pain mechanisms, and psychosocial factors to be brought into the Simmonds model (Fig. 40.3).

In this way, it can be seen that changes in pain and improved tissue health can occur when impairments improve and function recovers. Improving function and impairments provides an opportunity to improve pain just as lessening of pain can provide an opportunity to improve function. This quite palatable and integrative model allows a formidable (and changeable) choice of therapeutic and management possibilities for patients with musculoskeletal pain. At the present time, clinical research findings into the treatment and management of low back pain are pressing for greater therapeutic emphasis on assessment and management of findings on the right side of the

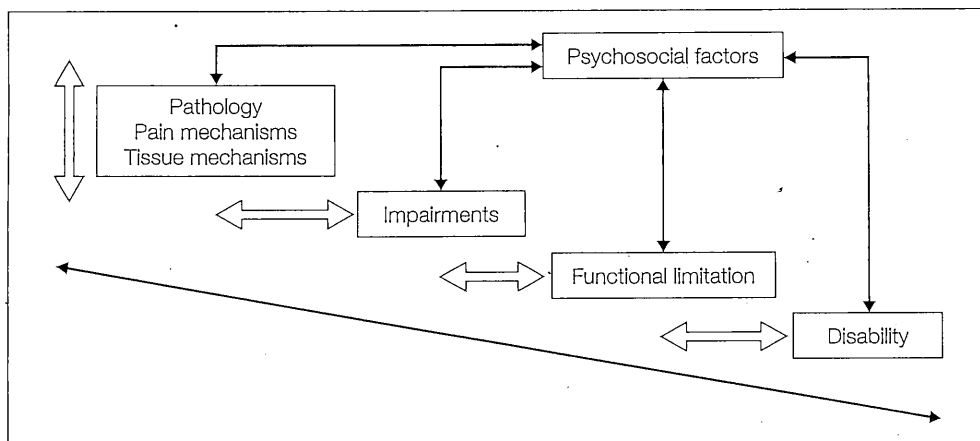


Fig. 40.3 The addition of pain mechanisms, tissue mechanisms, and psychosocial factors to the Simmonds bidirectional model.



## The mature organism model

The mature organism model (Gifford 1998d,e) was devised as a teaching tool for physiotherapists dealing with pain. It has also been used clinically as a teaching tool for helping patients appreciate the nature and broader impact of pain, and to then help them see the many options available.

The model attempts to integrate the central nervous system, the brain, and the mind and its inputs and outputs into physiotherapy reasoning processes in all patient problems whether they are acute or chronic in nature. The aim is also to shift thinking away from a linear, biomedical, in series and purely sensory model of pain with a bottom-up bias that starts in the tissues and stops in the brain, to a more complete biological model that is continuous and circular (see Figs 40.5 and 40.6).

The mature organism model embraces an organism's sensing, processing, response to, and recovery from threat at all levels. In so doing, it helps in the consideration of normal and natural recovery processes, as well as any other events and possibilities that may occur following injury and that may influence the efficiency of the processes required.

Pain may be best viewed as a behaviour-changing by-product of a response to threat (or perceived threat), where the primary purpose is to restore homeostasis, maintain function, and continue with life. Pain is therefore just part of the stress response. In this way, the nociceptive system, instead of being described as a pain-dedicated system, becomes, along with other immune and hormonal or humoral routes, part of a tissue or body sampling system, all the time analysing the status of the tissues and structures innervated.

Central scrutiny involves the gathering and assessment of information from the environment, the tissues, and from within the brain itself. Thus, in the case of acute tissue injury, the central nervous system of the mature organism may access appropriate conscious or subconscious memories, information, past experiences, past successful behaviours, and so forth that may be relevant to the situation and that may have an influence on the ultimate response patterns chosen in the battle to restore homeostasis. Where there has been an injury, this may include the production of pain, an emotional response, and a change in physical behaviour, as well as suitable primary physiological responses that facilitate the ultimate physiological and behavioural requirements of recovery. These responses, or outputs,

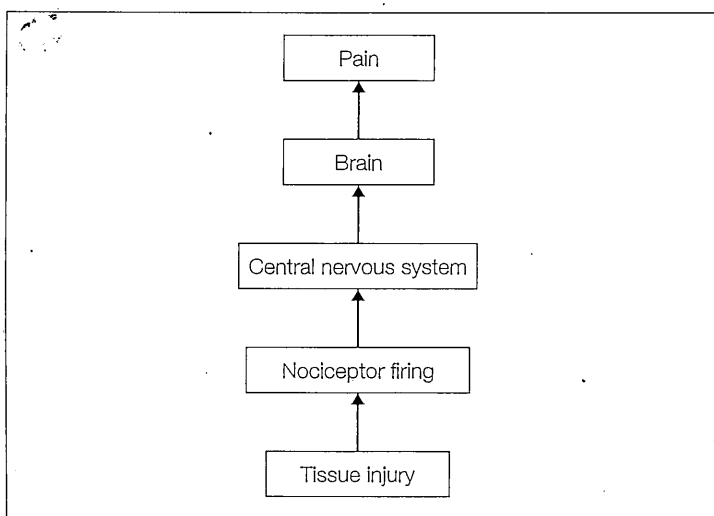


Fig. 40.5 The linear bottom-up model of pain.

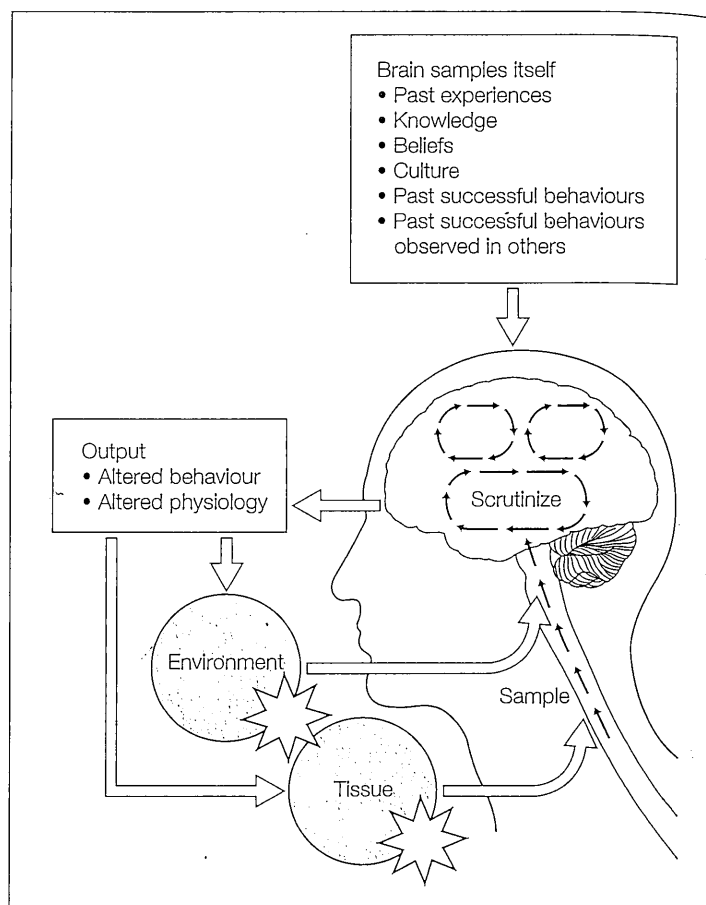


Fig. 40.6 The mature organism model. (Reprinted from Gifford & Thacker 2002. CNS Press.)

in their turn influence the tissues, the sampling pathways, and so subsequent responses.

The way an individual responds and reacts to their pain is predictive of how fast and how well they will recover (Watson 2000b). An example is the patient who is fearful of their pain and of reinjuring the tissues thought responsible. The resultant pain and activity-avoidant behaviour has the potential to lead to progressive tissue and wound deconditioning, inadequate healing, withdrawal from work and social activity, and a loss of general health and well-being that may include subsets of depression. From the perspective of the mature organism model, as well as from the Main and colleagues (Main et al 2000b; Fig. 40.4) and modified Simmonds (2002; Fig. 40.3) models discussed earlier, assessing pain and applying treatment in the isolated context of a single tissue or single pain mechanism seems biologically untenable.

The circular and feed-forward, feedback interactive model that the mature organism model attempts to present seems to be endorsed by the recent proposals of Damasio (2003). He provides convincing evidence to support the proposal that our mental state and our feelings of well-being are a reflection of our physiological state. Hence a joyous state relates to what he terms *optimal physiological coordination*. Thus the brain samples its own body and its environment, and places a 'feeling' label on it. If it is good and compatible with health and survival, feelings derived are pleasurable; if threatening, feelings are aversive. He critically proposes that the use of drugs, for example analgesics, by interacting with the feeling pathways or neural maps associated with physical monitoring, actually falsify the true

bodily state. He suggests, using examples of rebound effects of various mood-altering drugs, that this false improvement is likely to be biologically untenable and a prelude to worsening function (Damasio 2003). This finding seems to be underscored by the desirability of reduced drug intake found by some chronic pain management teams (Spanswick 2000). On the other hand, there is no discussion of maladaptive mechanisms or the suggestion that neural maps associated with feelings like pain might be formed inappropriately and therefore be a misrepresentation or exaggeration of the true body state (Melzack 1996). A useful everyday example of maladaptive mechanisms might be the intense and unremitting nature of pain of some acute and subacute sciaticas. The pain can be disproportionate to the physical damage that has occurred.

For physiotherapy, the important message from the work of Damasio (2003) is that the health and well-being of the body is vital to the generation of positive feelings and emotions that may well include pain reduction. The message from the three models presented here is to always think in multidimensional and multidirectional terms and therefore multiple potential targets and management options with every patient.

For physiotherapy, the current evidence presents an endorsement of 'in-parallel' management strategies that promote and muster physical well-being alongside those that address the positive aspects of our internal mental (psychological) and external (social and environmental) status. Physical training, reactivation and exercise in the wrong psychosocial context are unlikely to be productive. It is just as pointless giving a patient an exercise to improve a given range of movement as it is to give them a tablet to kill pain if their attitudes and beliefs about either of them are out of harmony with those of the persons who prescribe (Mackin 1997). For physical therapies to be successful, the physiotherapist needs to work hard with the patient to create the right context and atmosphere for best outcome.

### The biopsychosocial model

The biopsychosocial model proposed by Waddell (1987) draws attention to the impact of the patient's response to their situation, and the impact of their work and social environment, as well as the impact of any tissue abnormality, the pain, and relevant biomedical factors on their progression through the problem and eventual outcome. Psychosocial factors are now acknowledged to predict low back pain outcome far better than do the available physical and biomedical findings (Watson 1999b). While the bulk of the recent research here is still in the area of low back pain, it is reasonable to expect that psychosocial factors also significantly impact on other benign musculoskeletal pain states and disabilities. For example, Borkan and coworkers demonstrated that for a group of elderly patients following hip fracture, their perspectives of the underlying cause of their fracture was a better predictor of ambulatory outcome at 3 and 6 months than any of the biomedically oriented traditional physical outcome measures (Borkan et al 1991).

It seems that we are only now starting to get a much clearer picture of why some patients may recover well and why others do not with the same condition. And this understanding of course has the potential to help prevent chronic pain and pain-related physical incapacity.

The biopsychosocial model proposed by Waddell (1987) highlighted the *interaction* of the following factors for consideration on outcome and therefore for management:

- pain,
- attitudes and beliefs,
- psychological distress,

- illness behaviour, and
- social environment.

Physiotherapists are in a strong position to assess and modulate several of these factors.

### AN INTEGRATED MANAGEMENT STRATEGY FOR PHYSIOTHERAPY

The 'shopping basket' approach (Gifford 2002c) has been proposed as a working assessment and management model that integrates new ideas, while at the same time maintaining contact with current therapies and approaches but placing them in a more open and appropriate context. In effect, it is a physiotherapy compartmentalization of the important features of the biopsychosocial and disability models discussed. Inherent in this strategy is the gathering of patient-relevant material that can be managed, adapted, accepted, improved or resolved using a balanced combination of patient and therapist input. The emphasis is biased towards patient self-management, responsibility and involvement rather than being over-dominated by passive and pain-focused treatments (Klaber Moffett 2002a).

The shopping basket contains six interrelating compartments (see Box 40.1), all of which may need to be assessed with the potential for treatment or management in an in parallel fashion. In this way, the treatment of a patient with subacute sciatica might include adequate explanation of the problem, which is dominated by reassuring information (e.g. causes, likely course, and normal pain behaviour); explanation of the treatment and management strategy, as well as the likely outcome, using the best available evidence; a graded walking programme; a general graded exercise programme to maintain fitness; graded exercises to improve leg muscle weakness and function due to the neuropathy or pain; general and/or specific back and leg exercises to maintain or improve strength, range and health; balanced use of rest and activity using principles of pacing and incrementing (Harding 1998a, Shorland 1998); relaxation, ergonomics, and the appropriate use of transcutaneous electrical nerve stimulation and analgesics for pain management; maintenance of fitness of trunk and upper limbs; and help with preparations for a graded return to work (Gibson et al 2002). The precise integration and dosage of these is not a recipe to be prescribed for a condition, rather it is guided by the patient's individual presentation, capacities and negotiated goals.

This is in stark contrast to the rigid prescription of one or two back exercises and the regular attendance for treatment using any of a vast number of passive treatments and modalities.

#### Compartment 1: biomedical factors

Physiotherapists are trained to be highly skilled in history-taking and in physical assessment of musculoskeletal pain. Part of the current training in many parts of the world now includes the triaging for and recognition of serious pathology or injury and/or the presence of

#### Box 40.1 The 'shopping basket' approach

- Compartment 1: biomedical factors
- Compartment 2: psychosocial barriers to recovery
- Compartment 3: activity and participation capabilities and restrictions
- Compartment 4: physical impairments
- Compartment 5: physical fitness
- Compartment 6: pain



conditions where referral for medical assessment and management is appropriate and likely to be of benefit to the patient (Muncey 2002a).

The bulk of musculoskeletal pain states seen in primary medicine and by physiotherapists, however, are of benign origin, are difficult to offer an accurate or useful diagnosis to, and so far have few biomedical intervention options of proved value available (Nachemson 2000). Indeed, concerns about inappropriate medicalization and the subsequent application of ineffective and sometimes damaging treatments has been voiced (Allan & Waddell 1989, Waddell 1998).

In the context of biomedical and tissue-based thinking, it is suggested that physiotherapists consider the following questions relating to their patients (Gifford 2002c).

**Is the condition serious and require further investigation or appropriate medical management and intervention?** The following should be considered (see Royal College of General Practice 1996, Waddell 1998).

- Neurological disease, disorder or injury.
- Serious pathology: tumour, fracture, or biomechanical instability.
- Inflammatory disease.

**Is the nervous system competent?** This requires skilled assessment of reflexes, sensation and power. Physiotherapists are frequently involved in the treatment of pain conditions where frank impairment of nerve function is evident, for example in the treatment and rehabilitation of nerve root problems such as sciatica. Collaboration with primary medical practitioners is highly desirable, but specialist referral is not usually essential unless there is a rapid, severe and progressive development of neurological dysfunction (Waddell 1998). Guidelines for low back pain put particular emphasis on the need for urgent referral when there is evidence of cauda equina syndrome. Surgery may be an option for some nerve root problems, but referral is not as urgent unless the deficit is rapidly deteriorating (Royal College of General Practice 1996, Waddell 1998).

A competent neurological examination that reveals normal function provides excellent reassurance for both therapist and patient. For this reason, it is recommended that clinicians take time to explain their findings in a reassuring way to the patient (Klaber Moffett 2002a, Linton 1998). Modest deficits of function are also common, and for the same reason also need explaining and normalizing as far as possible.

**Are the tissues that hurt or that may be responsible for the hurt stable or strong enough to be progressively loaded to maintain and restore function?** Because early reactivation is a recommended primary goal, clinicians and in turn their patients need to feel confident that the structures that hurt or are responsible for the hurt are capable of being loaded.

Progressive or graded loading and reactivation can be achieved only in an atmosphere of confidence. To achieve this, clinicians need to consider such issues as time since onset, details of injuring mechanisms and the forces involved, the mechanical stability of the tissues, and the healing time or stage, as well as the general health, age and well-being of the patient.

Waddell's physiological view of health is paramount (Box 40.2).

A consideration of tissue mechanisms and whether the underlying processes are adaptive or maladaptive may be relevant. For example, an inflammatory mechanism may be operating associated with normal early healing, and hence may be deemed adaptive. The clinical option is thus to avoid interventions that might dampen inflammatory mechanisms and to focus on appropriately paced rehabilitation. Graded mobilization of activity of healing tissues in combination with

#### Box 40.2 Waddell's physiological view of health

- Continued use is essential to maintaining health: 'use it or lose it'.
- Function stimulates and maintains structure.
- Use leads to improved functional capacity, fitness and performance.
- Movement promotes healing.

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adequate pain control and management is currently recommended (Waddell 1998).

If the inflammation is considered maladaptive or undesirable, options for management frequently include the application of most physiotherapy modalities in association with the use of non-steroidal anti-inflammatory drugs and other inflammation-modifying drugs. Maintenance, modification and restoration of function are still vital considerations.

**What pain mechanisms are operating, and can they be considered adaptive and helpful or maladaptive and unhelpful?** Importantly, pain mechanism allocation (Gifford & Butler 1997) is often tentative. Even so, it helps the therapist to rationalize and make sense of the presentation. The therapist can then use the knowledge to provide the patient with a well-reasoned explanation.

For example, where maladaptive central mechanisms are operating, the pain is likely to be mysterious and worrying, and often been given inadequate explanations from previous medical encounters. These patients are often grateful to receive a well-supported and rational explanation for their pain. An explanation that reconceptualizes the problem away from the notion of tissue weakness and harm is often the point from which patients start to be able to move on towards a productive recovery pathway.

An analysis of pain mechanisms may also help with choice of treatment and management options, as well as providing information on which to base progress and prognosis. For example, conditions deemed to have an underlying neurogenic mechanism are known to take longer to resolve or have a less favourable outcome (Clinical Standards Advisory Group 1994, Spitzer et al 1995).

**Are there any other interventions available that can help in the management or treatment of the presentation?** For example, the integration of psychological and medical interventions alongside physiotherapy has been recommended for the management of chronic regional pain syndrome (Stanton-Hicks et al 1998, Thacker & Gifford 2002).

**Is the presentation a common syndrome?** The identification and categorization of presentations into common syndromes can be of value in that many have quite well-established natural histories, which clinicians need to pass on to their patients so that they can accept and adjust to the situation. For example, in a review of the literature on frozen shoulder presented by Stam (1994), the natural history was divided into three overlapping phases: first, the painful phase lasting anything from 2½ to 9 months; then a stiff period lasting between 4 and 12 months; and finally a recovery period that could be as short as 5 months or go on for up to 2 years and 2 months. The total duration reported extended from 12 months to 3½ years, with an average resolution time of 2½ years. This is not a condition to be treated 2 or 3 times per week for month after month, but one where information is given and strategies for pain management,



as well as joint and muscle health and function, are instigated, maintained, and followed through where necessary. A great deal more research is into the natural history and the waxing and waning of common conditions like this is urgently required.

A basic human drive is to feel and be in control; useful information helps patients to gain control, adapt to the situation, and in so doing reduce uncertainty. Honest and realistic information to patients about the nature and progress of their problem seems vital here.

### Compartment 2: psychosocial barriers to recovery

To identify patients who are at risk of developing chronic pain and associated disability problems, physiotherapists are being encouraged to actively screen for, identify, and then appropriately manage relevant psychosocial components (Main & Watson 1999, Watson 1999b, Watson & Kendall 2000). It is emphasized that this is not about seeking to label a patient's problem as psychologically mediated, but an attempt to identify some of the barriers to recovery that might be present, to then treat and manage them, and ultimately to improve the outcome for the patient.

The *yellow flag* initiative for low back pain, with its implications for psychosocial assessment and management, has been written up for physiotherapists (Kendall & Watson 2000, Main & Watson 2002, Watson 2000b, Watson & Kendall 2000). The stated purposes of the development of the yellow flags were as follow.

- Provide a method for screening for psychosocial factors.
- Provide a systematic approach to assessing psychosocial factors.
- Suggest strategies for better management for those with pain who appear at a higher risk of chronicity.

They focused particularly on the identification of a number of key psychological factors (Main & Watson 2002).

- Presence of a belief that back pain is harmful or severely disabling.
- Fear-avoidance behaviour patterns with reduced activity levels.
- Tendency to low mood and withdrawal from social interaction.
- Expectation that passive treatments rather than active participation will help.

#### Box 40.3 Important psychosocial factors to assess

##### Patient characteristics

- Misunderstanding regarding causation (hurt equals harm)
- High levels of distress at the onset of an acute pain problem
- Catastrophizing (fearing the worst)
- External locus of control (passive, expecting others to cure the problem)
- Doctor and treatment shopping
- Substantial anger (at the initiating cause, the pain itself, and the medical profession)
- Fear avoidance of pain and activity

##### Outside influences

- Work and benefits
- Compensation and litigation
- Family reinforcement of illness

##### Doctor- or therapist-dependent factors

- Unclear diagnosis or mixed messages from different doctors and therapists
- Unclear explanations of pain
- Inadequate assessment or examination
- Unrealistically optimistic promises of outcome
- Reinforcing passivity of the patient
- Reliance only on medication or rapid referral

#### Box 40.4 The seven areas of enquiry for psychosocial factors

- A: attitudes and beliefs about the pain
- B: behaviours
- C: economic and compensation issues
- D: diagnosis and treatment issues
- E: emotion
- F: family
- W: work

These factors have been usefully divided into three categories (Mair & Watson 2002): see Box 40.3.

Physiotherapists have been urged to structure their psychosocial screening and associated narrative reasoning around the seven key areas of enquiry using the easy reminder 'ABCDEFW' (see Box 40.4). To help with this, Main & Watson (2002) have adapted the work of Kendall and colleagues (Kendall et al 1997) to provide a useful set of stem and supplementary questions that can be used or reworded by clinicians to assess each component.

For example, questions relating to the patient's attitudes and beliefs about the pain (A) may reveal that in their view they have badly injured or worn bones and joints, and that any undue activity is likely to be damaging and make the condition much worse. Questions relating to B (behaviour) may further reveal that the patient is adopting a very passive attitude to their recovery by resting a great deal, avoiding activity, taking a great deal of medication, using various supports and walking aids, and withdrawing from normal routines. Clearly, physiotherapy intervention needs to help the patient re-evaluate the situation, see the possible consequences (such as de-conditioning), and to then agree to, feel comfortable with, and start a graded and goal-oriented programme of reactivation and resumption of normal activity.

In the management of acute pain states, enquiries about psychosocial factors and their management are still highly relevant and need addressing. The results of early preventive programmes, such as those published by Linton (1998), are persuasive:

...we found that a secondary prevention program in primary care, for first time sufferers, significantly reduced disability and reduced the risk of becoming chronic by 8-fold as compared to 'treatment as usual'. The program included a thorough examination by a doctor and physical therapist, information designed to reduce fear, uncertainty and anxiety, self-care recommendations, and the recommendation to remain active and continue everyday routines.

(Linton 1998)

Consideration of the *mature organism model*, detailed earlier, permits the integration of potential psychophysiological effects on inflammation and healing efficiency into the reasoning framework. For example, in all patient interactions there is a potential for the therapist to bring about changes in problem-related beliefs, anxiety and distress, and for these changes to link to physiological changes in tissues. High states of anxiety are associated with the production of a stress response, the biological purpose of which is to promote behavioural and physiological processes linked with survival. Thus the stress response is associated on the one hand with increased catabolic (breakdown) physiology, the purpose of which is to provide energy for possible physical action, and on the other with the inhibition of anabolic (building) processes associated with tissue growth and repair. This is to conserve energy. Decreasing the stress associated with a

pain state, via for instance a thorough examination and a reassuring explanation of the findings, may well have physiological spin-offs that positively influence the efficiency of the tissue recovery process (see Gifford 2002d). Further, reduced anxiety about the pain or the problem often leads to the patient paying less attention to it and getting back into activity (Indahl et al 1995).

Clinicians are urged to consider the potential behavioural and physiological impact imparted by not only the applied therapies, but also the atmosphere created and the way in which the examination, treatment, exercise programme, and information are provided (see Noon 2002).

### **Compartment 3: activity and participation capabilities and restrictions**

The case for the maintenance of function, activity or work in acute management, the early return of function and activity in acute and subacute management, and the re-establishment of normal function in chronic pain-disabled patients is now strong.

The following are important considerations in all patients.

- Being occupied diverts attention away from pain.
- Being inactive leads to deconditioning and is also associated with withdrawal from work and social activities. The consequences of this can be a feeling of hopelessness and helplessness that can mean the onset of depression.
- Circulation, exchange of metabolites, and healing are promoted by movement. Injured tissues tend to heal to the strength required by the demands put on them (Harding 1999).
- Reactivation and rehabilitation are strongly linked to patient beliefs and behaviour, in particular those relating to fear and avoidance (see *Compartment 2: psychosocial barriers to recovery*). Patients are often wary of moving or exercising, because they lack confidence and have not been given any clear advice or guidance. In situations where they feel safe and supported, patients can find that they are able to start to move normally and without any particularly bad repercussions. This is a unique skill provided by physiotherapy.
- A process using the principles of graded exposure is suggested (Vlaeyen & Crombez 1999, Vlaeyen & Linton 2000). Here patients start off with activities and activity quotas they feel confident with and build from there. Old-school physiotherapy 'bullying tactics' and therapist-determined prescription of the amount and type of exercise without patient consultation and agreement are no longer recommended.
- Adequate pacing of rest and activity is important. Here, quotas start easy and with small amounts, building via progressive increments to more regular participation and for longer periods each time (Brook 2002, Harding 1998a–c, Shorland 1998). The principle is similar to that used in fitness training and in the rehabilitation of sports injuries.
- Negotiating adequate and appropriate functional goals with patients is an important requirement (Watson 2000a).
- Patients frequently need help with pain control and pain management (see *Compartment 6: pain*, and Linton 1997).
- The concomitant management and improvement of relevant impairments may be of help in many cases. For example, improvements in range of movement, quality of movement, and strength of muscles are frequently accompanied by a lessening of pain and increased patient confidence and optimism (Richardson & Jull 1995, Vicenzino & Wright 2002).

Methods for the assessment and measurement of function for acute and chronic back pain have been proposed, validated, and described in detail (Harding et al 1994, Simmonds 2002). The development and validation of reliable functional measurement tools for other conditions seen by physiotherapists are a major requirement that needs addressing.

### **Compartment 4: physical impairments**

Physiotherapists are experts at observation, examination and correction of physical abnormalities, for example impairments found in tissue and joint anatomy, biomechanics, tension, range, mobility, strength, movement patterns, and functional activities.

Physiotherapists draw on many impairment-focused skills, techniques and approaches that may coincidentally or intentionally also help to relieve pain and improve function (see Box 40.5).

### **Compartment 5: physical fitness**

Watson (2000a) in his chapter reviewing the physical activity programme content for chronic pain management programmes states:

Physical activity is perhaps the most powerful component in pain management programmes. Increasing fitness is important not only in reversing the disuse syndrome, but in giving a powerful signal to patients that they are beginning to regain a degree of control over their musculoskeletal system. It is therefore extremely important from both the physical and the psychological point of view.

(Watson 2000a)

The detrimental effects of inactivity, immobilization, disuse, deconditioning, and low physical fitness, and the beneficial general health effects relating to increased activity and fitness are now well established and extensively reviewed elsewhere (see Box 40.6). It seems essential for physiotherapists, whether involved in the management of acute or chronic pain, to quickly involve the patient in the maintenance or improvement of their general physical health. Thankfully, a great many of the detrimental effects are, with effort, reversible.

While the evidence in favour of physical fitness for health benefits seems overwhelming, the evidence for benefits in relation to pain states is still scant and equivocal. In summarizing the literature in relation to low back pain, Waddell (1998) states that:

There are many health advantages to being physically fit. There are strong theoretic reasons and some clinical evidence to suggest that physically fit patients may make a more rapid recovery from

#### **Box 40.5** Physiotherapy techniques and approaches commonly used for the management of impairments and associated pain

- Passive mobilization, manipulation and massage (Boyling & Palastanga 2004, Vicenzino & Wright 2002, Wells et al 1994)
- Active exercise—muscle imbalance and stabilization (Hides & Richardson 2002, Pitt-Brooke 1998, Richardson et al 1998); proprioceptive neuromuscular facilitation (Guymier 1994, Pitt-Brooke 1998); plus other specific (e.g. various forms of stretching and strengthening) and general exercise techniques (reviewed in Boyling & Palastanga 2004, Kerr 1998a).
- Movement retraining.
- Desensitization programmes.
- Pain modalities (see *Compartment 6: pain*)

**Box 40.6** Some detrimental effects of immobilization and inactivity that may be relevant to the establishment and maintenance of pain and pain-related disability states

- Muscle wasting, weakening, and loss of endurance
- Degeneration and atrophy of all components of musculoskeletal tissues, hence loss of strength and elasticity
- Reduced motor control and proprioceptive efficiency, hence reduced balance, slower reaction times, and impaired protective mechanisms
- Stiffer joints, slower movements, and abnormal accessory movements
- Decreased ability to use energy substrates efficiently
- Decreased neuromuscular transmission and decreased efficiency in muscle fibre recruitment
- Autonomic changes similar to those found in chronic regional pain syndrome I (i.e. sweating changes, swelling, and changes in skin colour and temperature)
- Pain and increases in sensitivity to touch and movement (allodynia)
- Cognitive dysfunction
- Mood changes
- Decreased self-efficacy
- Reduced coping capacity
- Loss of vitality and loss of energy
- Circadian rhythms desynchronize
- Increased risk of injury at work
- Increased costs of compensation claims
- Higher frequency of back pain
- Less efficient metabolism
- Cardiovascular deconditioning

References: Bortz 1984, Buckley et al 1999, Buckwalter 1995, 1996, Gifford & Thacker 2002, Goodship et al 1994, Harding 1999, Harding et al 1998, Kerr 1998b, Michel & Wittink 1998, Troup & Videman 1989, Uthoff & Jaworski 1978, Verbunt et al 2003.

acute back pain and be less likely to develop chronic pain and disability.

In summary, physical fitness may help to reduce the likelihood of developing new episodes of back pain, but is probably more relevant to dealing with back pain once it has occurred.

(Waddell 1998)

Box 40.6 summarizes some of the detrimental effects of immobility and inactivity that may be relevant to pain states. An observation is that low physical fitness represents a vulnerability state which may well be a factor in up-regulating central pain promoting systems (Watkins 2000, Ursin & Eriksen 2001).

### Compartment 6: pain

Clearly, a major goal of physiotherapy management is to reactivate patients. Pain management and pain control are important and sometimes central features of good therapy. Targeting the source of the pain is not always essential, but understanding the antecedents for pain increases and decreases can often help with better treatment and management strategies.

## PHYSIOTHERAPY PAIN TREATMENTS AND PAIN CONTROL

The mechanisms by which most physiotherapy treatments affect pain and tissue status have been reviewed in detail (e.g. Baxter & Barlas 2002, Sluka et al 2002, Vicenzino & Wright 2002, Watson

2000c, Wright 1995, 2002). Most explanations invoke tissue-based mechanisms but also embrace central nervous system mechanisms at spinal and brain stem level to include descending pain modulatory pathways. Acknowledgement of psychophysiological effects mediated via belief and enthusiasm (patient- and therapist-mediated), learning and conditioning, expectation, the therapeutic alliance, and changes in attention and stress, as well as immunological, hormonal and neurological pathways, are of major importance yet still inadequately voiced (Evans 2003, Lawes 2002, Noon 2002, Peters 2001, Price 1999, Roche 2002a,b).

At the present time, physiotherapists are struggling with proof of efficacy, the evidence-based movement, and the common criticism that the modalities used are 'merely' a placebo or are totally ineffective. This stance is highly understandable, because most clinical trials and meta-analyses of research into the effectiveness of physiotherapy modalities demonstrate too poor a quality, are inconclusive, or show little valuable effect (Gross et al 2002, Klaber Moffett 2002b, Koes et al 1996, Smith 2002, Thacker 1998, Thacker & Gifford 2002, van der Windt et al 1999, van Tulder et al 2000). However, an important conclusion that in the main the trials show *lack of evidence* rather than *evidence of lack of effect* has been proposed (Thacker & Gifford 2002).

There are a great many issues to acknowledge and problems to overcome. For example, everyone is different and every therapist is different. Any given individual is likely to respond differently to any given modality, even with the same apparent pain condition. Therapists, just as patients, tend to gravitate towards techniques and modalities they feel comfortable with and enjoy having or doing and find effective. Successful pain modulation requires the gathering and assembly of a great many variables and should always be considered in a broad physiological-psychological and psychophysiological context, already discussed with reference to the mature organism model. This broader picture of patients' pain experiences cannot easily be obtained within the quantitative research paradigm alone. Rather, future research needs to strategically draw from both the quantitative and qualitative or interpretive research paradigms for the full scope of biopsychosocial influences to patients' pain experiences and the effects of more holistic management as recommended here to be revealed (Jones & Higgs 2000, Miller & Crabtree 2000).

Furthermore, the label *placebo* is not at all helpful, but a better understanding of the placebo certainly is (see Ch. 24).

The failure to demonstrate superiority over placebo need not imply lack of efficacy; it may imply only similarity of mechanism. Comparison of a treatment with a placebo is therefore not a comparison to two mechanisms, only a comparison of their ability to activate the same mechanism...

(Lawes 2002)

Providing support and secure treatment—often involving touch, care, and passive treatment—for those who are in acute pain and vulnerable is a natural and possibly highly evolved behaviour and need state that is likely to be linked to positive, recovery-enhancing, physiological mechanisms (Gifford 2002d, Roche 2002b, Wall 1999).

As argued throughout this chapter, because passive pain-relieving modalities alone appear to be inadequate, they should not be seen to form the main thrust of a given treatment plan. Graded withdrawal of passive pain-relieving modalities and the quick inclusion of patient-directed pain management, graded reactivation, and self-management in the acute and subacute phases is recommended (Klaber Moffett 2002a).

Many therapies and approaches that physiotherapists use, in particular the complementary therapies but also many of the various

manual therapies and traditionally used modalities, can be associated with what Evans (2003) calls 'crackpot theories'. He suggests that these theories promote a continuing schism between orthodox and complementary approaches (Evans 2003, p. 162). Unfortunately, as Evans (2003) points out,

...there is always the possibility that doing away with the crackpot theories that provide alternative therapies with some of their appeal might actually rob them of their effectiveness, by destroying the vital belief that enables them to mobilise the placebo response. The truth may well rob some patients of their favourite therapeutic resources.

(Evans 2003)

Passive modalities may help some individual patients through pain flare-ups. Provided patients remain employed and active or quickly return to normal daily routines, their use is warranted, but the patient must always have a role to play. A great deal of care needs to be employed to prevent unnecessary dependence on therapy. When used strategically, selective treatment (active or passive) of identified physical impairments can provide direction to specific self-management exercises.

## PAIN MANAGEMENT IN PHYSIOTHERAPY

An understanding of the biopsychosocial model and the subsequent integration of cognitive-behavioural principles and approaches into physiotherapy have led to some quite significant changes and improvements in practice (Harding & Williams 1995, Munccey 2000, 2002a).

At one end of the clinical spectrum, physiotherapists are involved in the physical activity components of multidisciplinary pain management programmes for chronic pain-disabled patients (Watson 2000a, Wittink & Michel 1997). At the other, more acute or early end of the spectrum, physiotherapists—as well as focusing on maintaining or improving function and treating and managing pain—are beginning to integrate and put more emphasis on dealing specifically with relevant psychosocial elements using skills gleaned from their colleagues working in the chronic pain management programmes. While still in its formative stages as new skills are being integrated, longer-term outcomes for acute and subacute low back pain programmes that include cognitive-behavioural elements are showing rewarding results when compared with standard management (Klaber Moffett & Frost 2000, Linton & van Tulder 2001). For example, a randomized controlled study of a 'Back to Fitness' programme for back pain sufferers whose problems were of between 4 weeks' and 6 months' duration demonstrated significant long-term improvements (Klaber Moffett & Frost 2000, Klaber Moffett et al 1999). Two important findings were highlighted by the authors.

1. An exercise programme led by a physiotherapist in the community and based on cognitive-behavioural principles helped patients to cope better with their pain and function better even 1 year later.
2. Patients in the intervention group tended to use fewer healthcare resources and took fewer days off work.

A follow-up study of the Back to Fitness programmes has demonstrated that patients who score highly on fear-avoidance beliefs particularly benefited (Klaber Moffett et al 2004).

The following list summarizes some of the important skills required in cognitive-behavioural interventions in pain management (Harding 1998a, Harding & Williams 1995, Harding et al 1998, Munccey 2002b,

Watson 2000a). Many can be adapted and used in the less severely entrenched pain problems that physiotherapists encounter. The current challenge is for educators to provide physiotherapists with the required skills and to show how they can be integrated alongside, and sometimes instead of, the more traditional tissue-based approaches.

## Some useful components of cognitive and behavioural interventions for physiotherapy management of pain

### Self-management

Interventions are geared towards giving the patient control and being patient-oriented rather than adhering to any prescriptive and rigid therapist-determined plan of action. Hence therapist input requires the provision of open information, guidance, and negotiated agreement of any tasks or goals.

### Information

Reassuring explanations and clear advice are given, for example about the pros and cons of analgesics or other drugs, the causes and behaviour of pain, the patient's diagnosis, healing and recovery processes, biomechanics and ergonomics, the examination findings, tissue healing and health, the results of tests such as scans and X-rays, and information about physiotherapy interventions and goals. Information provision is often very useful and should in part be driven by an understanding of the patient's beliefs and attributions regarding their pain and the nature of their problem. Moseley (2003) draws attention to the benefits of pain education for patients with chronic pain, as a vehicle to decrease the threat value of pain for the patient. He introduces physiotherapists to the concept of deep learning of information as opposed to superficial or surface learning, whereby information is remembered but not understood or integrated with attitudes and beliefs.

### Reinforcement skills

Reinforcement skills for example encourage patients with their own efforts, and encourage patients to recognize their improvements and achievements then attribute them to their own efforts.

### Acquisition of problem-solving skills

This involves helping patients work through and find ways of overcoming problems they encounter in their physical reactivation programmes, and then to be able to generalize the skill to day-to-day life problems.

### Graded exposure

Graded exposure tackles activities and physical tasks that are feared and/or avoided because of pain or the belief that they will cause further pain and damage. The process helps the patient to restore physical confidence via agreed graded progressions and pathways. For example, a patient with back pain who fears bending may agree with confidence to begin gentle pelvic rocking or flexing exercises lying and progress to bending while sitting before making attempts standing. As confidence and skills are improved, the later stages may include increased loading and more functional tasks, as well as performing the tasks faster.

## Pacing

Pacing is a strategy that enables patients to control exacerbations of pain by learning to regulate activity and rest more efficiently. Once a paced activity or exercise regimen is established, the patient can gradually increase the amount performed and move towards an agreed predetermined goal. A major aim is to prevent the common over-activity-pain-rest cycle that so often leads to failure, reinforcement of the pain-sensitive system, and a gradual reduction of performance.

## Goal setting

Watson (2000a) recommends that goals should always be attainable, personally relevant, interesting, measurable, and be set in three separate domains:

- *physical*, relating to exercise programmes;

- *functional* tasks relating to everyday activities; and
- *social*, relating to pleasurable social activities.

## CONCLUDING COMMENT

For a long time, physiotherapists have been troubled by their assignment to a lowly position within the medical hierarchy. Of late, physiotherapy has come a long way in integrating better science and reasoning. In so doing, it has been healthily questioning its own practical and theoretical foundations. It is hoped that this chapter goes some way towards presenting the profession's stance for patients with pain in a new, more energetic, more dynamic, and much better light.

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