

# Role of psychology in pain management

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'I went to see someone, I can't remember his name, a Mr somebody, who told me that my spine was crumbling. Well obviously I have to be careful not to bend in case I make it worse, or it snaps!'

Patients often report what may seem to the health-care professional to be bizarre or irrational beliefs. However, when we investigate further the background of these beliefs they can often have a simple, if important, route. The above statement, for example, was spoken in clinic by a chronic back pain patient who had been informed that he had marked 'disc degeneration' on x-ray findings. For all patients with pain, what is understood about the meaning of pain, disease and/or disability will play a part in the presentation of the problem and the effectiveness of treatment. For patients with chronic pain, these beliefs form part of the psychosocial context, known to be the largest influence in predicting the extent of pain-associated disability. For the clinician interested in improving assessment and treatment, an understanding of the role of psychological factors in the presentation of a pain problem is a fundamental requirement.

In this article I will introduce the field of psychology as applied to pain management and attempt to demystify some of the practices and translate some of the jargon. First, I will introduce the relevant psychological theory, focusing on the clinical utility of the research findings. Secondly, I will expand on the psychology of the chronic pain patient. Finally, I will present the evidence for psychologically orientated therapies for chronic pain management.

## Psychological factors in pain perception

The importance of psychology in the expression, understanding and treatment of pain was recognized in early theories of nociception. These theories accepted the top-down influence of midbrain and cortical structures in pain expression.<sup>36</sup> Similarly, with the advancement of the psychology of behaviour in the 1950s and 1960s, the role of environment in shaping treatment behaviour and complaining behaviour was also further developed.<sup>19</sup> These theories were clinical in nature as they arose from the growing problem of patients suffering from chronic unremitting pain and disability. Psychology also found its place

in pain treatments after the growing recognition that the extent of complaint and disability reported by many patients could not be explained by the extent of damage or disease.<sup>20 21</sup>

## *Pain, tissue damage and disability*

Pain is the most common reason for patients to enter health-care settings and the most common reason given for self-medication.<sup>61</sup> Pain interrupts all other activity and arrests current behaviour. It functions to prime escape or protective behaviour.<sup>15</sup> As it is an everyday and frequent experience, there is also a common understanding of pain, both lay and professional, that it is a useful signal of damage.<sup>1</sup> Indeed, in the majority of cases pain is a relatively reliable signal of damage and one that refers well to its spatial location. Also, the intensity of pain often refers well to the extent of damage. For example, extracting two teeth hurts about twice as much as extracting one tooth.<sup>28</sup>

There is, however, a number of cases where the extent of damage does not refer well to the experience of pain.<sup>65</sup> For example, some people report pain that has no identifiable lesion, as in many cases of back pain, headache and angina. It is also possible to have tissue damage without any pain. For example, up to 40% of patients with established reversible myocardial ischaemia do not report pain. More recently, it has been recognized that it is possible to experience pain in a location distal to the damage or to experience pain in a missing or extra limb or location. Even under laboratory conditions, where we can control the intensity of the pain-inducing stimulus, there is a great deal of variability in patient response.<sup>12</sup> We should be mindful of the fact that pain is not a reliable indicator of tissue damage and that tissue damage is not a reliable indicator of pain.

There is also a number of cases where the extent of damage and the extent of pain together do not refer well to the experience of disability. Some patients appear not to be disabled by extensive damage and pain, whereas other patients respond with extensive disability to seemingly minor damage and pain. This variability can be witnessed in everyday practice. Anyone who is in the business of hurting people as part of their routine work will understand that different people respond differently to the same procedure

under the same circumstances, and that the same people respond to the same procedure differently at different times or under different circumstances. A brief and unscientific survey of colleagues or friends as to their choice of analgesia during dental procedures will quickly exemplify this variability.

### *Understanding differential responding*

We can successfully conclude that people are different and respond differently to pain-inducing stimuli and to attempts at pain management. This is perhaps not the most astounding and revelatory of claims ever made but it can be of crucial importance for the delivery of successful pain management. If we can understand what predicts these differences we may be able to improve treatment delivery and effectiveness.

Early theories of the psychology of pain assessed global factors such as personality, gender, age and culture. These global or broad-sweep explanations seem to have an intuitive appeal and one still hears them supported in everyday practice. The evidence in support of these explanations, however, is not always persuasive or conclusive.

#### *Personality*

A number of studies have attempted to describe or uncover what may be thought of as a pain-prone personality. It was thought that those who were less hardy or less robust to the hardships of the world would show less tolerance of pain stimuli and would be more complaining of pain. In addition, there was also the idea that the pain expressed by patients was a manifestation of guilt or of loss, or that pain revealed a self-destructive, sadomasochistic style of sexual development.<sup>16</sup> There is no evidence, however, to support these ideas. I mean not to negate the importance of differences in individual personalities, but rather that the search for a unified pain personality was unsuccessful. The experience of pain does not prevent personality disorders but neither is it thought to be a mask or alternative manifestation of them.<sup>67</sup>

#### *Gender*

In an excellent recent review of this field, Anita Unruh reported that 'In most studies, women report more severe levels of pain, more frequent pain and pain of longer duration than do men.'<sup>59</sup> Women are more likely to experience recurrent pain, have moderate and severe pain from menstruation and childbirth and may be at increased risk of disability arising from pain. Unruh also reported that, despite the fact that women report more pain than men, women are at greater risk of being labelled as having a psychogenic disorder and are more vulnerable to pain being explained as a purely psychological (used pejoratively in this case to mean unreal) phenomenon.

#### *Age*

Very little is known about the specific effects of age and ageing and about the psychology of pain for specific age groups. For example, effective pain management in children has been hampered by the erroneous beliefs that neonates and infants could not feel pain and that children would respond addictively to opioid analgesia. We now know these ideas to be without support.<sup>22</sup> An important but unresearched area is the effects of emotional and cognitive development upon the experience of pain for children and adolescents. At the other end of the lifespan, we are also only now beginning to learn about the effects of cognitive impairment on pain experience.<sup>41</sup>

#### *Culture*

Early studies of the effect of culture focused upon the reports of ethnic differences in pain expression. However, the study of culture extends further than the ethnic group membership of patients. For example, a recent interesting study showed that ethnic differences (in a US sample) did not affect the report of post-operative pain or patient-controlled analgesia for post-operative pain, but did, however, affect physician prescribing behaviour.<sup>40</sup> More recently, the study of cultural influences has extended to the broader study of the cultural construction of pain and has started to embrace the use of anthropological and sociological methods.<sup>39</sup>

## **Specific psychological factors**

Although early theories focused on global factors, more recent areas of study have developed our understanding of specific psychological traits or specific states of experience that affect the report of pain and suffering.

#### *Fear*

Pain functions to threaten danger and invoke an escape or ameliorative response. This threat component of pain is not an addition to the sensory component, nor does it follow from the sensory aspects. Instead, it is a primary and central component as it urges analgesic behaviour. Fear and anxiety processes have been studied from a number of perspectives, although they cover essentially the same issue. The most relevant to clinical practice are reviewed here.

#### *Attention and vigilance*

Threatening pain is a stimulus that orients attention to both the source of pain and the potential for escape or analgesia. Some people have increased or heightened attention to pain sensation. In particular, where the threat of pain is constant or recurrent, a pattern of vigilance to pain can develop. McCracken developed a measure of vigilance to pain with a sample of chronic low back pain patients and found that patients who report high levels of attention to pain also report higher pain intensity, increased use of health-care resources and more emotional distress. Vigilance to pain

was a significant predictor of disability, distress and use of health-care resources.<sup>33</sup> Hypervigilance or excessive attention to threat has also been offered as a possible explanation for the dominant anxiety and poor concentration observed in patients with diffuse idiopathic or fibromyalgia pain.<sup>44 66</sup> One test of this hypothesis found that fibromyalgia patients reported a lower threshold and higher tolerance to an experimentally induced pain than did a sample of patients with rheumatoid arthritis, who, in turn, reported lower threshold and higher tolerance than a non-pain control sample.<sup>34</sup> Using a different measure of attention to pain, we have found in our laboratory that patients who attend frequently towards diffuse bodily sensation are much more vulnerable to repeated interruption by high-intensity pain.<sup>14</sup> Heightened and habitual attention to pain and bodily sensation is associated with high levels of disability and distress for patients with chronic pain.

#### *Catastrophizing and worry*

The consequences of repeated attention to threat may be the development of a fixed pattern of responding to threatening stimuli and pain. One particular response to threatening pain, which is proving to be predictive of the severity of complaint of pain, has been termed 'catastrophic thinking' or 'catastrophizing'. Put simply, this is a habitual, almost immediate, appraisal of a situation as extremely and globally catastrophic. Sullivan and colleagues have developed a measure of catastrophic thinking about pain that assesses the extent to which we magnify the outcome and effects of pain, consider ourselves helpless to respond, and have little control over whether we think this way or not.<sup>51</sup> They conducted two experiments, the first with pain-free students, who they subjected to a cold-pressor procedure, and the second with patients undergoing an aversive medical procedure. They found that catastrophizers reported significantly more negative pain-related thoughts, more distress and higher pain intensity compared with non-catastrophizers. Keefe and colleagues have used a different measure of pain control and catastrophizing in studying clinical populations. For example, they studied patients with rheumatoid arthritis who had undergone knee replacement surgery and found that those who rarely catastrophized had much lower levels of pain and disability than patients who catastrophized often.<sup>23</sup> Recently, we have argued that catastrophic thinking can usefully be understood as an extreme form of a normal process of worrying about pain. Chronic worry about pain and how to solve the problem of pain may lead to a pattern of catastrophic thinking.<sup>2</sup>

#### *Avoidance*

One consequence of the urgency effect of pain, the fact that pain demands a change of behaviour, is that patients with pain avoid pain-inducing activity. A number of studies now show that the pain alone is insufficient to explain disability and avoidance. McCracken and colleagues, for example, demonstrated that the fear of pain made a unique and significant contribution to the prediction of disability.<sup>32</sup>

Taking this further, some authors have argued that the fear of pain is more disabling than pain itself.<sup>62</sup> In a recent study of this idea, Crombez and colleagues replicated the finding that pain-related fear is a better predictor of disability than pain, but also extended the findings to a behavioural performance test. They showed that, when instructed to engage in a behavioural performance task that involves musculoskeletal loading, chronic low back pain patients performed poorly on the task. Poor behavioural performance was predicted by elevated levels of fear of (re)injury due to movement and the fear of the effect that physical activity would have on the pain.<sup>7</sup> Pain-related fear is thought to mediate the effects of pain upon performance. A recent authoritative review of this emerging field argues that the avoidance of pain or injury-inducing activity is a normal mechanism of survival. However, when pain becomes chronic, those with marked fear of pain chronically avoid activity that leads to disability. Counter-intuitively, in many cases of chronic non-malignant pain, it may be more healthy to confront or engage in physical activity that, in the short term, produces pain and the fear of pain and (re)injury.<sup>60</sup>

#### *Depression*

The experience of pain and the threat of pain can lead to negative or low affect. Chronic low affect, including persistent feelings of frustration and anger and negative or destructive self-appraisal are common effects of persistent pain. Unsurprisingly, the majority of adult chronic pain patients who present for treatment at pain clinics are also depressed to some degree. However, this depression is not brought about directly by the pain severity but by the disabling consequences of how one reacts to the chronic pain.<sup>57</sup> There are a number of facets of depression that are important in understanding the pain patient.

#### *Anger*

Anger is not always associated with depression. However, it is included here as the angry pain patient is often poorly understood. Anger is a relatively common experience for pain patients and so, in turn, for the pain professional. Where there is no clear immediate object of anger (e.g. an aggressive other person or an immediate agent of injustice), it is often associated with global frustration and hostility, feelings of aggression and a feeling of being blamed. Anger in chronic pain patients is often unrecognized as a means by which patients attempt to claim self-control or self-esteem. Anger and hostility can have significant deleterious effects upon both health and treatment effectiveness.<sup>17</sup> Treatment of the very angry patient requires a high degree of trust and honesty in an environment of cynicism and hostility. Aggression and overt anger often increase the probability of treatment ineffectiveness as either patient or therapist will withdraw from therapeutic contact, thereby fuelling anger. Treatments designed for the chronic pain patient

should directly address in some form the effects of anger and frustration.<sup>63</sup>

#### *Self-denigration*

A key component of depression is the extent to which individuals appraise their self-worth and abilities negatively (e.g. 'I'm useless and pathetic', 'I'll never be able to control this pain'). Early research suggested that negative self-appraisal may promote a self-fulfilling prophecy in which patients learn to be helpless and hopeless. Research with rheumatological patients did not find any convincing evidence for this case.<sup>49 52</sup> Rather, recent evidence indirectly suggests that what may be important about depression in chronic pain is the extent to which the pain refers critical judgement onto the self. Recent experimental studies demonstrate that patients have specific, not global, memory biases for pain information that refers negatively to the self.<sup>42</sup> Although a focus on the specific self-denigrating effects of depression and pain is only now being developed and data are certainly needed, it could have far-reaching effects on current self-management approaches to chronic pain. Simply instructing patients that the route to successful management of pain lies with them may be an invitation to fail. Indeed, many pain patients, when presented with the idea of self-management, first understand this to mean a threat to their worthiness for treatment.<sup>13</sup>

#### *Coping*

The term 'coping' is often used to denote two similar events. First, it is understood to mean anything that one does in response to a stressful event, regardless of its efficacy in removing the stressor or in relieving the stress response. Secondly, it is understood to mean a positive effect of either removing the stressor or relieving the stress response.<sup>37 38</sup> Here I take it to have the first meaning. Whenever we are faced with a stressful event such as pain, or the fear of pain, we respond. This response can have both positive and negative effects. The personality variables discussed above will have a strong effect on the response people make to pain and/or the fear of pain. However, the search for patterns of responding or types of responding has also included other ideas worth mentioning.

#### *Action and control*

First, the idea that there are passive and/or active ways of responding is commonly held. Patients who are passive in response to threat show greater distress and disability than patients who attempt to solve problems.<sup>50</sup> Similarly, those who believe that they have the personal ability to have control over pain also show improved function and fitness.<sup>10</sup> One interesting investigation found that if women in active labour are given some control over parts of the delivery process, positive effects can be seen in terms of reduced pain, reduced tiredness and increased energy even if this control is only at the level of monitoring.<sup>27</sup> Taking some control over the cause of pain or the method of analgesia has

a beneficial effect. Those who respond actively to pain or the fear of pain are more likely to adjust effectively.

#### *Information and predictability*

Related to whether one takes action or takes part in analgesic procedures is the effect of whether one seeks to predict the effects of pain or whether one prefers to be distracted. Many experimental studies of the possible effects of distraction from, or attention to, pain and analgesia have been conducted. The key finding is that both approaches can be effective. However, the most important finding suggests that only those strategies that fit with a person's preferred or habitual method will be effective. For example, if someone is used to managing the pain of dentistry by thinking of anything else but dentistry, giving the patient detailed information about the procedure will simply undermine an effective strategy. Crombez and colleagues reported an interesting study of what information it might be useful to have for those who pay attention to the pain.<sup>6</sup> They found that information about the sensation of the expected pain did not improve the reaction to the pain. However, knowing how long a pain will last did improve the reaction to the pain.

#### *Making sense of the pain*

People are intrinsically motivated to make sense of experience. Except in extreme cases of depression or in specific circumstances of prolonged restriction or incarceration, people are motivated to reach an understanding of personal events. Until a pain is understood within a system of knowledge, it will interrupt current thinking and promote worry and concern. Knowing what has caused a pain and what it may mean and does not mean is critical for effective coping. Those patients who are most difficult to help are those who repeatedly present with problems that have no known aetiology.<sup>48</sup> Not knowing compounds distress and an uncertain diagnosis leads to an increased belief in illness.<sup>5</sup>

#### *Clinical implications for acute pain management*

The experience and expression of pain are complicated, multifactorial events. However, most clinicians ignore these factors and do not attempt to harness their effects. Worse still, there is a large industry dedicated to the eradication of these effects as they pollute otherwise neat designs for testing the effects of pharmacological agents upon an analgesic response. For it is these effects that make up the placebo element of all analgesics.<sup>43</sup> Unfortunately, the efforts to limit the placebo effect rather than understand and control it may be throwing the baby out with the bath-water.<sup>35</sup>

Perhaps a certain ignorance of the psychological factors is understandable. One could suggest that in most acute pain situations these factors take care of themselves and do not need attending to. I would go further and suggest that, even if the pain relief was not psychologically optimal, then in most cases it is unlikely to lead to any long-term psycho-

**Table 1** Using psychological factors in clinical practice

Vigilance to pain	Patients are distracted by the pain and are urged to react. Pain patients will have impaired concentration as they are being interrupted constantly by an aversive stimulus. Keep all communications clear and brief. Repeat key points often. Expect patients to talk about the pain often, as it is being brought repeatedly into attentional focus for them. This is not a sign of a somatization disorder or hypochondria.
Avoidance	Patients will naturally avoid pain and painful procedures. Be aware that this will occur and plan for it. Painful treatments will be avoided and patients will compensate for any disability caused by avoidance (e.g. shifted body weight distribution). If a habitual pattern of avoidance develops, this may lead to chronic pain. Patients must be given an understanding that pain does not necessarily equal damage. A credible medical authority must deliver this message.
Anger	Patients with pain may shout at you, abuse you and generally be hostile to you. If they are hostile to you they have probably been hostile to everyone. Most often this will have nothing to do with you, and you will need to understand that anger normally means extreme frustration, distress and possibly depression. Anger functions to push people away and isolate a person. The angry pain patient is therefore less likely to have received or heard any information about their problems and be more confused than the non-angry patient.
Involve the patient	First, assess the patient's normal way of coping with pain by simply asking how he or she has coped with predictable pain, such as a visit to the dentist. Secondly, match your strategy to the patient's preference. If the patient needs information, inform them how much pain they may expect to feel, what it may feel like and, critically, for how long (if this information is known). Always slightly overestimate the time rather than underestimate it. Finally, if possible, involve the patient in the delivery of any pain management strategy.
Make sense of the pain	Always ask the patient what they know and fear about the cause of the pain, the meaning of the pain and the time course of the pain. Expect the unexpected. What makes sense to one person is nonsense to another. What matters is that it is their understanding, not yours, that will inform their behaviour. Uncertain diagnoses or unknown diagnoses will lead to increased vigilance to pain and increased symptom reporting.
Consistency	Develop a consistent approach to clinical information, patient instruction and patient involvement within pain management. Practice should be consistent for each patient and from each member of the pain team, over time.

logical damage. However, there are certain cases where a working and applied knowledge of the above factors can improve the patient's distress and function, reduce pain and fear of pain, improve the effectiveness of non-psychological analgesics and reduce physician distress. Table 1 offers a clinical summary of how the above knowledge may be used to best effect in everyday practice.

Although there is a plausible argument to be made that in many acute pain situations the psychological factors are of less importance for the busy clinician to attend to, for chronic pain they are unavoidable and of critical importance. Of the population of patients who report persistent and unremitting pain that has lasted for 6 months or longer, a large and growing number are highly distressed and repeatedly present for a wide range of treatments.<sup>9 61</sup>

## Chronic pain

In addition to experiencing pain, chronic pain patients who present for treatment are often disabled and report other associated problems, such as sleep difficulties and fatigue.<sup>37</sup> Over time they may have become interpersonally isolated and have developed unsatisfactory family roles and responsibilities.<sup>26</sup> It is common that an untherapeutic reliance upon social and medical support systems develops in which people continue to seek and receive treatment.<sup>47</sup>

The persistent attempts to react and adapt to pain and its widespread destructive consequences often result in a range of emotional problems, such as depression and pain-related fear. Interestingly, chronic pain patients have an elevated presentation of other phobic responses, such as the fear of

social interaction, leaving secure environments, blood, illness and death.<sup>3</sup> Chronic persistent pain, fear and depression inevitably have negative effects on other aspects of cognition. Patients commonly complain of poor concentration,<sup>25</sup> poor memory<sup>46</sup> and increased failure to complete cognitive tasks.<sup>11</sup>

For patients with this complex or syndromal presentation, the treatment of choice is cognitive behaviour therapy, preferably delivered at an interdisciplinary pain management centre. Without the input of such an interdisciplinary team, the dangers of ineffective or harmful treatments are significantly increased as patients persist in seeking a cure for an incurable pain.<sup>29</sup> For such patients, the focus of treatment should be shifted away from the pain towards the detrimental effects of pain. Table 2 outlines the domains of a pain experience that are the targets of therapy.

There exist reliable instruments for each of these domains of experience, and it is recommended that in routine non-psychological practice the effect of pain upon these domains is assessed and that the effects of any treatment upon these domains is also assessed. Assessment of the chronic pain patient and the performance of current instrumentation has been reviewed comprehensively.<sup>68</sup> With the exception of pain experience, the remaining six domains are the typical targets of treatment for a programme of cognitive behavioural therapy (CBT). Although CBT is increasingly common for the treatment of young children and adolescents with chronic pain, it is rarely found in a programmatic form.<sup>64</sup> Pilot work in this area does, however, seem promising.<sup>30</sup> For the present, the description of the critical factors of cognitive behaviour therapy and the evidence for

**Table 2** Domains of chronic pain experience. Adapted from Morley and colleagues<sup>38</sup>

1. Pain experience	Subjective pain expressed in terms of its intensity, sensory quality and unpleasantness.
2. Mood/affect	Current depression and situational anxiety and longevity of depression and anxiety can be measured. Specific fear responses, such as fear of movement, can also be important to assess.
3. Existing coping methods	Patients respond to pain and threat in a relatively ordered and predictable way. Existing coping strategies and styles, such as the extent of passivity and negative appraisal and the extent of catastrophic thinking and problem-solving ability, can be assessed.
4. Pain behaviour	Overt behavioural acts associated with pain should be assessed as a communication of current distress and as a factor in eliciting others' coping responses. Disability and function should also be assessed using standard self-report instruments and, wherever possible, objective measures.
5. Physical fitness	In some conditions it may be important to measure the effects of pain or treatment on biological measures of disease or fitness.
6. Social role functioning	Pain changes all social role functioning. Key areas that respond to treatment are employment contribution, marital satisfaction, sociability, parental stress and styles of family coping with illness.
7. Health-care behaviour	This specific class of behaviour should be separated from the general class of pain behaviour because it is a critical factor in pain experience and in pain treatment. Key areas are the use of prescribed and over-the-counter medications, visits to general practitioners, and repeat and routine visits to pain clinics.

its effectiveness will be reviewed for adults with chronic pain only.

### *Cognitive behaviour therapy*

'Cognitive behaviour therapy' is a compound term for the selected combination and integration of treatments aimed at reducing or extinguishing the influence of the factors that maintain patients' maladaptive behaviours, beliefs and patterns of thought. Often this treatment is organized as a programme of therapy and is delivered by a team of pain therapists, including anaesthetists, clinical psychologists and physiotherapists. Pain management programmes vary in content and duration as they are often tailored to local populations and specific client groups. They are also commonly constrained by practical and financial contingencies and the currently poor availability of suitably trained and competent staff.

What is important to convey here about this treatment is not so much the specific content of each individual session, but the underlying process that structures the therapy. The seven key factors addressed in a successful programme will now be described.

#### *Direct positive reinforcement of pain behaviour*

All overt behaviours communicate pain to others, including tone and content of speech, gait and posture, facial expression and the use of medical aids. Often, the consequences of pain behaviours are detrimental for the patient and add to suffering. A CBT environment would be sensitive to the situations in which patients are directly reinforced for pain behaviours and would seek to minimize their effects.

#### *Indirect positive reinforcement of pain behaviour*

Avoidance behaviour is the most common form of reinforcement of pain and disability. Patients will continue

to avoid pain-eliciting situations, believing this avoidance to be analgesic when in fact it promotes further pain. Patients develop a symptom-contingent pattern of activity: doing more when one feels good and less when one is in more pain. Over time, this leads to a steady decline in overall activity. These patterns are replaced within CBT by encouraging patients to behave time-contingently and to plan for achievable goals. Successes can then be reinforced.

#### *Positive reinforcement of well behaviour*

Chronic pain patients are rarely reinforced for well behaviours. Most staff members are trained to attend to problems and family members are used to responding to need rather than wellness. Lack of reinforcement of health behaviours extinguishes or diminishes the behaviour. In a CBT environment, staff should be trained to recognize and reinforce well or healthy behaviour. They should also be trained to encourage patients and family members to be self-assessing and self-reinforcing of well behaviour.

#### *Physical fitness and function*

Chronic pain patients typically lose any sense of normal sensation and normal physical stress and strain. Therefore, the unfit and sedentary patient will experience many symptoms of physical disuse that can be regarded as pain-related and potentially harmful. Increasing general fitness is thought to reduce fatigue and reduce the number of fatigue-related somatic symptoms that can be judged to be pain related. Personal achievement in fitness and function are common goals for patients and can often provide a first point of positive reinforcement and self-reinforcement.

#### *Cognitive reframing*

Patients are encouraged to develop insight into the automatic nature of self-defeating and self-denigrating patterns of thinking. Patients are then encouraged to test the reality of these patterns of thinking and develop ways of challen-

ging the premises from which these thoughts arrive. This principle of developing a controlled metaperspective in which one can understand the effects of thoughts upon feelings and feelings upon thoughts underpins a number of the typical contents of therapy, including communication skills, improved problem identification and problem solving, anger management, stress reduction, and the development of a self-relaxation response.

#### *Education and empowerment*

Often, a first stage in treatment is to provide a credible rationale for treatment. Education alone is not an effective treatment for chronic pain. However, an understanding of the self-management approach is essential. Key areas that are commonly addressed are the causes and consequences of pain, managing doctor–patient communications, anatomy and biomechanics, the rules of social interaction, and sleep hygiene.

#### *Critical process factors*

In addition to these six therapeutic principles that underpin the content of specific sessions in a typical programme of CBT, there are also a number of factors that determine the process or successful delivery of the therapy. Any therapy must be clearly directed and all staff should operate under a consistent set of principles. The more experienced the staff, the better the therapy will be. Similarly, if staff have been trained for this specific treatment rather than having general training, the therapy will be more effective. Regular structured supervision for all team members should be compulsory because the difficulties and distress of patients are often transferred to team members. Conflicting models of treatment should be avoided. For example, changing an analgesic regime in the middle of a CBT programme would undermine the development of self-reinforcing well behaviour. In all cases, CBT should be understood as the beginning of a lifestyle change, and appropriate maintenance of change components should be included.

#### *The evidence base*

There are three meta-analyses and reviews of the effects of CBT in chronic pain. The first included all non-medical trials and uncontrolled trials.<sup>31</sup> The second addressed only psychological treatments and also included uncontrolled trials.<sup>18</sup> The third focused upon only randomized controlled trials of psychological and educational treatments in a primary care setting.<sup>58</sup> The two meta-analyses that included non-randomized controlled trials found that the largest treatment effect sizes were for changes in mood, behaviour and pain, with smaller treatment effect sizes for use of health-care resources. The third meta-analysis reported similar findings with the exception of the finding for mood.

We conducted a systematic review and a meta-analysis of all randomized controlled trials of cognitive behaviour therapy for adults with chronic pain.<sup>38</sup> Excluded were trials of therapy for chronic headache as these have different

targets of therapy, where lasting pain relief is a realistic target. In all, there were 33 published randomized controlled trials, of which 25 gave analysable data. Most trials used either a waiting list control group or another treatment. All domains of chronic pain experience (Table 2) were coded for effect sizes. Compared with a no-treatment control, CBT produced significant effect sizes in all domains. Compared with another treatment, CBT produced significant effect sizes for the domains of pain, coping and pain behaviour. We concluded that ‘published randomized controlled trials provide good evidence for the effectiveness of cognitive behaviour therapy and behaviour therapy for chronic pain in adults’. It is worth noting that these effect sizes are of a similar size to those found in the psychotherapy research literature and are high when compared with non-psychological treatments for chronic pain.

There is no shortage of evidence for the effectiveness of CBT on the range of domains of chronic pain experience. However, the challenge for effective CBT for the management of chronic pain comes with the delivery of effective treatment programmes. CBT is complex, lengthy and highly variable and is critically dependent upon the quality and training of staff and the appropriate content of therapy. Currently, there exists no national standard for treatment effectiveness and no requirement for audit and improvement. However, the effectiveness of appropriately designed and competently delivered CBT is well established and recent policy has strongly recommended its inclusion in routine pain clinic work.<sup>4 8 29</sup>

The next generation of CBT for the treatment of chronic pain will need to include a clear recognition that this treatment is designed for long-term changes, and so will need to include methods of reducing relapse and attrition from treatment. Further treatment will also need to address and quantify the effects of critical process variables, such as patient adherence to treatment and the therapists’ use of evidence-supported protocols. Perhaps the most significant challenges in the development of improved CBT are the ability to tailor treatments to individual needs and to develop treatment programmes for specific groups such as children.<sup>45 54–56</sup>

## **Summary and conclusion**

Psychological factors are central to the experience of pain, the delivery of effective analgesia and for the specific treatment of chronic pain and disability. Improvement in pain management can often be brought about by very simple, if subtle, changes in clinical practice. Although simple, these changes can have significant effects in the experience of pain, distress and use of health-care resources. For the chronic pain patient, the presentation is much more complex and the treatment interdisciplinary and programmatic. The evidence for the effectiveness of cognitive behaviour therapy for adults with chronic pain is now well

established. This treatment should be available as a core part of any chronic pain service.

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