

Psychological Approaches in the Treatment of Chronic Pain Patients—When Pills, Scalpels, and Needles Are Not Enough

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Background: Chronic pain is a prevalent and costly problem that eludes adequate treatment. Persistent pain affects all domains of people's lives and in the absence of cure, success will greatly depend on adaptation to symptoms and self-management.

Method: We reviewed the psychological models that have been used to conceptualize chronic pain—psychodynamic, behavioural (respondent and operant), and cognitive-behavioural. Treatments based on these models, including insight, external reinforcement, motivational interviewing, relaxation, meditation, biofeedback, guided imagery, and hypnosis are described.

Results: The cognitive-behavioural perspective has the greatest amount of research supports the effectiveness of this approach with chronic pain patients. Importantly, we differentiate the cognitive-behavioural perspective from cognitive and behavioural techniques and suggest that the perspective on the role of patients' beliefs, attitudes, and expectations in the maintenance and exacerbation of symptoms are more important than the specific techniques. The techniques are all geared to fostering self-control and self-management that will encourage a patient to replace their feelings of passivity, dependence, and hopelessness with activity, independence, and resourcefulness.

Conclusions: Psychosocial and behavioural factors play a significant role in the experience, maintenance, and exacerbation of pain. Self-management is an important complement to biomedical approaches. Cognitive-behavioural therapy alone or within the context of an interdisciplinary pain rehabilitation program has the greatest empirical evidence for success. As none of the most commonly prescribed treatment regimens are sufficient to eliminate pain, a more realistic approach will likely combine pharmacological, physical, and psychological components tailored to each patient's needs.

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Clinical Implications

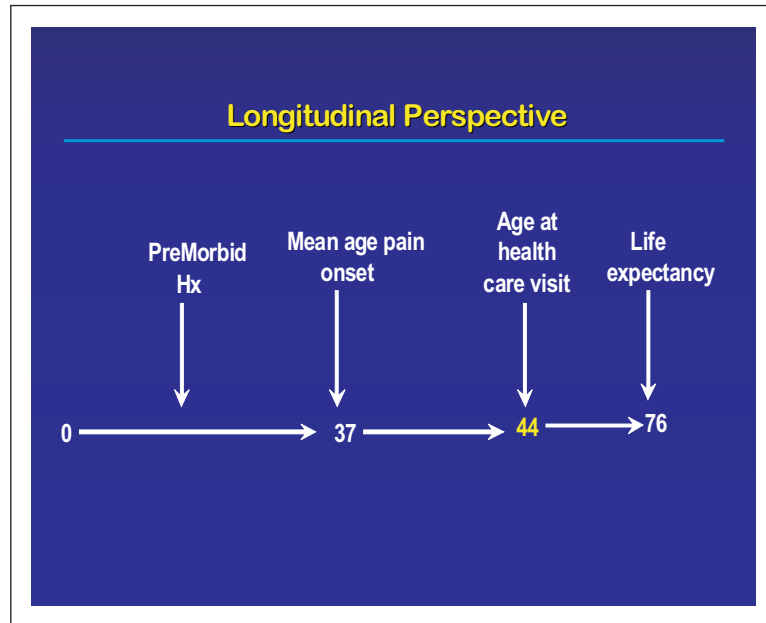
- Chronic pain is a complex phenomenon that consists of biological, psychological, and social components.
- Physical and psychological adaptation to chronic pain does not constitute psychopathology, rather it reflects normal processes of the human condition.
- No single treatment for chronic pain will be efficacious alone, rather a combination of treatment modalities will yield the best results.

Limitations

- Literature concerning the numerous relaxation techniques and methods to induce hypnosis are inconsistent as to which are the most effective and (or) they contain discrepancies, which makes evaluation of efficacy difficult.
- Currently, few data are available that are consistent in identifying the characteristics of people who would most likely benefit from any of the pain treatment methods described.
- Studies are needed to determine which treatments delivered in what ways are most effective for people with what set of characteristics with the least iatrogenic complications and adverse events.

Key Words: *chronic pain, operant conditioning, psychological treatment, psychological therapies, cognitive-behavioural, psychosocial, respondent conditioning, psychological techniques*

Figure 1 Chronic pain: a longitudinal perspective^a



^aTakes place within a social context

Chronic pain is prevalent and affects about 20% to 30% of the adult population in Western countries.¹ By definition, chronic pain persists for extended periods of time. Although therapeutic approaches have resulted in significant improvements, the most potent drugs only reduce pain by 30% to 40% in fewer than 50% of patients.² Similarly, sophisticated surgical techniques, such as implantation of artificial discs in the spine³ and implantable drug delivery systems,⁴ provide limited pain reduction in only a subset of patients.

Even when medications and invasive procedures effectively reduce pain, they often do not produce concomitant improvements in physical and emotional functioning. Moreover, many prescribed treatments can result in significant complications or side effects. For example, more than 40% of patients who are implanted with pain-alleviating devices will experience significant adverse events⁴ and premature termination rates from drug clinical trials often exceed 30%.² Further, opioids, the most potent and frequently prescribed class of drugs to control pain, carry significant risk of misuse and abuse that may exceed 40%.⁵⁻⁷

The mean duration of pain in patients seeking treatment and treatment from chronic pain treatment facilities is about 7 years.⁸ Consequently, all domains of their lives are com-

promised for a significant amount of time. Further, the average age of patients treated at multidisciplinary pain rehabilitation facilities is 44 years.⁸ Thus, prior to pain onset, these people have histories spanning 37 years; therefore, their prior histories are important in understanding how people respond to their symptoms and plight. Moreover, most people live a social context. Significant people in patients' lives likely influence their adaptation (see Figure 1).

After patients receive appropriate treatment, because chronic pain is incurable, they are left to manage their residual symptoms on their own. In the preface to "The Management of Pain," first edition,⁹ and repeated 36 years later in the second edition,¹⁰ Bonica observed that:

The crucial role of psychological and environmental factors in causing pain in a significant number of patients only recently received attention. As a consequence, there has emerged a sketch plan of pain apparatus with its receptors, conducting fibers, and its standard function which [sic] is to be applicable to all circumstances. But . . . in so doing, medicine has overlooked the fact that the activity of this apparatus is subject to a constantly changing influence of the mind.^{p 12}

Based on the evidence presented, 2 conclusions are obvious: psychosocial and behavioural factors play a significant role in the experience, maintenance, and exacerbation of pain; and because some level of pain persists in most people with chronic pain, regardless of treatment, self-management is an important complement to biomedical approaches.

Abbreviations used in this article

- CBT cognitive-behavioural therapy
- RCT randomized-controlled trial

There are numerous psychological approaches to facilitate adaptation and self-management of patients' symptoms. The most common approaches include insight-oriented therapies, behavioural treatments, and CBT. In addition, several techniques based on these models have been efficacious (that is, motivational interviewing, biofeedback, relaxation, guided imagery, hypnosis, and meditation) independently or as part of comprehensive rehabilitation. In this review, we provide an overview of psychological approaches and techniques for the treatment of patients with chronic pain. We emphasize the cognitive-behavioural perspective for conceptualization and treatment within an interdisciplinary framework because it has the greatest empirical support.^{11–13}

Insight-Oriented Approaches

Insight-oriented approaches are predicated on the belief that chronic physical pain may be somatic presentations of emotional distress, and nonconscious factors will influence both the onset and the maintenance of symptoms. As one set of evidence to support this assumption, insight-oriented practitioners often cite the data on the prevalence of childhood physical and sexual abuse acknowledged by people reporting chronic pain.^{14,15}

Psychodynamically-oriented therapy and insight-oriented approaches primarily focus on early relationship experiences that are reconstructed within the therapeutic relationship. The therapeutic relationship reintegrates emotions into symbolic and available mental processes, resulting in improved emotional regulation.¹⁶ Although insight-oriented psychotherapy may be useful with select individuals,¹⁶ to our knowledge, no RCTs have been published demonstrating its efficacy for people with chronic pain problems.

The Role of Reinforcement in Maintenance of Pain Behaviours

Pain is subjective; the only way we know about someone's pain is to ask, observe, and make inferences about their behaviour. When patients are asked about their pain, they may provide numerous descriptors that convey information; however, there is no objective criterion. Observation of behaviour, for example, limping or grimacing, may indicate something about subjective states. However, this inference can only be confirmed by self-report because the association between objective evidence of pathology is only weakly associated with reported pain.¹⁷ Self-report or other behaviours are merely surrogates for the subjective experience of pain. Furthermore, persistent noxious symptoms will take a toll among others living with or in close contact with the patient.¹⁸

Behaviour is communication that elicits responses from observers. Consider a woman who is rubbing her neck and moaning. Her husband observes these behaviours and infers

his wife's neck pain is flaring up. If he acknowledges her pain, brings her medication, rubs her neck, and spends time talking with her, assuming these are desired responses, they will serve as positive reinforcement. What the patient has learned is that her pain-related behaviours communicated a message to her husband. This learning process may increase the likelihood that she will increase these behaviours as a way of obtaining desired responses from others in the future.

Behavioural principles work in another way. Avoidance of undesirable activity and or behaviours that reduce distress is negatively reinforcing. Negative reinforcement strengthens a behaviour because the negative condition is terminated or avoided as a consequence of the behaviour. Consider a patient in physical therapy who reports that whenever he performs certain exercises his pain increases. The physical therapist may tell him to stop the activity ("If it hurts, don't do it"). Assuming his pain is reduced by termination of the activity, the patient will learn that avoidance of activity has a positive effect. Avoidance is a positive outcome and may negatively reinforce similar behaviours when the circumstance arises again. This has the unintended consequence of increasing physical deconditioning. Although this may be an appropriate response for acute pain, it may not be in the context of chronic pain and the attainment of corrective feedback—activity may not increase pain. Corrective feedback is necessary to learn that hurt and harm are not the same thing.

Physicians and patients also demonstrate a potent reciprocal relationship of reinforcement that influences each others' behaviours. Studies have shown that physicians prescribe treatment for pain patients based on observations of patients' behaviours, including emotional distress, compared with physical pathology or pain severity.^{19,20} Conversely, patients observe the responses of their physicians. If they note (learning might not be a conscious process) that either the physician increases their analgesic medication when they are more demonstrative—pain behaviours, complain more, appear more distressed—the next time they visit the physician, they may present as more extreme to obtain attention and further treatment.

Failure to positively reinforce well behaviours, such as activity, will influence behaviour. Behaviour that is not positively reinforced will be reduced or even extinguished. The behavioural principles related to reinforcement are outlined in Table 1.

Two treatment approaches have been developed based on behavioural principles of reinforcement and conditioning. These are described briefly in the next section.

Respondent Conditioning

If a nociceptive stimulus is repeatedly paired with a neutral stimulus in close temporal proximity, the neutral stimulus will

Table 1 Nature and effects of reinforcement on pain behaviour

Schedule	Consequences	Probability of the behaviour recurring
Positive reinforcement	Reward the behaviour	More likely
Negative reinforcement	Prevent or withdraw, avoidance	More likely
Punishment	With negative emotions and much attention	More likely
Punishment	With little attention, ignoring the behaviour	Less likely
Neglect	Prevent or withdraw positive results	Less likely

elicit a pain response. This is referred to as classical or respondent conditioning. In chronic pain, many neutral or pleasurable activities may elicit or exacerbate pain. Thus, over time, numerous stimuli (for example, activities) may be expected to elicit or exacerbate pain and will be avoided (that is, stimulus generalization). The anticipatory fear of pain and restriction of activity, and not just the actual nociception, may contribute to disability. Anticipatory fear can also elicit physiological reactivity that can aggravate pain. Thus, conditioning can directly increase nociceptive stimulation and pain.

The longer inactivity prevails the more difficult it is to modify people's convictions and behaviours. Treatment of pain from the respondent conditioning model includes repeatedly engaging in behaviours that produce progressively less pain than was predicted (corrective feedback)—exposure that is then followed by reductions in anticipatory fear and anxiety associated with the activity. Such transformations lend support to the importance of quota-based exercise programs, with participants progressively increasing their activity despite fear of injury and discomfort associated with use of deconditioned muscles.

Operant Conditioning

Operant approaches focus on the extinction of pain behaviours. Therapists withdraw positive attention for pain behaviours while increasing reinforcement of well behaviours. The operant paradigm does not seek to uncover the etiology of symptoms but focuses on the maintenance of pain behaviours and deficiency of well behaviours. Pain behaviours are identified, as are their controlling antecedents and consequent reinforcers or punishments,¹² such as overly solicitous behaviours by a spouse.²¹

Reduction, and ultimately elimination of the connection between pain behaviours and their positive or negative consequences, is used to increase and maintain desired behaviours and decrease pain-compatible behaviours. With operant behavioural treatment, individuals are expected to be active in setting treatment goals and follow-through with recommendations.¹² The efficacy of operant treatment was demonstrated in several studies of individuals with various chronic pain

disorders, including low back pain²² and fibromyalgia syndrome.²³

Cognitive-Behavioural Perspective and Therapies

Perhaps the most commonly adopted treatment approach for chronic pain patients is CBT.¹¹ It is important to make a distinction between the cognitive-behavioural perspective and cognitive and behavioural techniques.²⁴ The cognitive-behavioural perspective is predicated on the assumption that people hold the belief that they are unable to function because of their pain and helpless to improve their situation (see Table 2). Treatment goals focus on helping people with pain to realize that they can, in fact, manage their problems, and provide them with skills to respond in more adaptive ways that can be maintained after treatment is terminated. The techniques used can be drawn from among those described in this article.

The CBT approach typically combines stress management, problem solving, goal setting, pacing of activities, and assertiveness. These skills can be integrated within a rehabilitation approach. Cognitive and behavioural techniques are woven into the fabric of treatment in an effort to enhance patients' sense of self-control. Biofeedback, relaxation, meditation, guided imagery, and hypnosis (described below) can all be incorporated within CBT to facilitate perceptions of self-control. The objective is to help patients acquire a sense of hopefulness, resourcefulness, and action to replace their more typical feelings of hopelessness, stress reactivity, and passivity.

In CBT, therapists assist patients with their concerns about the future, returning to work, and physical limitations. They help people build their communication skills, gain a sense of control over their pain, and cope with fear of pain, reinjury, or frustrations owing to the responses of others. Patients are taught positive coping strategies and are encouraged to increase their activities in a graded fashion. The expectation is that patients will gain mastery over their pain, resulting in improved mood.²³

Table 2 Assumptions of the cognitive-behavioural perspective

<p>People are active processors of information and not passive reactors</p> <p>Thoughts (for example, appraisals, expectancies, beliefs) can elicit and influence</p> <ul style="list-style-type: none"> • Mood • Affect physiological processes • Have social consequences <p>Thoughts also serve as an impetus for behaviour</p> <p>Conversely, mood, physiology, environmental factors, and behaviour can influence the nature and content of thought processes</p> <p>Behaviour is reciprocally determined both by individual and by environmental factors</p> <p>People can learn more adaptive ways of</p> <ul style="list-style-type: none"> • Thinking • Feeling • Behaving <p>People should be active collaborative agents in changing their</p> <ul style="list-style-type: none"> • Thoughts • Feelings • Behaviour • Physiology

The 4 key components of CBT have been described as: education, skills acquisition, skills consolidation, and generalization and maintenance.²⁴ The education component focuses on helping patients challenge their negative perceptions regarding their abilities, and to manage pain by making them aware of the role that thoughts and emotions play in potentiating and maintaining stress and physical symptoms—in effect, cognitive restructuring. Cognitive restructuring includes identifying maladaptive thoughts during problematic situations (such as during pain exacerbations and stressful events), introduction and practice of coping thoughts and behaviours, shifting from self-defeating to coping thoughts, practice of positive thoughts, home practice, and follow-up. The therapist encourages patients to test the adaptiveness of their thoughts, beliefs, expectations, and predictions. The crucial element is bringing about a shift in the patient's repertoire, from well-established, habitual, and automatic but ineffective responses toward systematic problem solving and planning, control of affect, behavioural persistence, or disengagement from self-defeating situations when appropriate.²³

The goal of skills acquisition and consolidation is to help people learn and, importantly, practice new pain management behaviours and cognitions, including relaxation, problem

solving, distraction methods, activity pacing, and communication. Therapists use education, didactic instruction, Socratic questioning, and role-playing techniques among others. However, the techniques are less important than the general message of self-management that is derived from experience using various techniques (some of which are described below). Patients may learn best from observing the outcomes of their own efforts rather than by instruction alone. Often CBT is carried out in a group context where the therapist can use the support of other patients and also have patients interact with each other to assist in providing alternative ways of thinking and behaving.

Finally, generalization and maintenance is geared toward solidifying skills and preventing relapse. Homework is an essential ingredient of CBT. Once patients have been taught and have practiced self-management skills within the therapeutic context, it is essential that they practice these in their home environment where the therapist is not present to guide and support them. The difficulties that will inevitably arise when attempts are made at patients' homes become important topics for discussion and further problem solving during therapeutic encounters. Problems that arise during home practice are viewed as opportunities to assist patients to learn how to handle setbacks and lapses that will likely occur following treatment. In this phase, therapists assist patients to anticipate future problems and high-risk situations so that they can think about and practice the behavioural responses that may be necessary for adaptive coping.

The goal during the latter phase, then, is to enable patients to develop a problem-solving perspective where they believe that they have the skills and competencies to respond in appropriate ways to problems as they arise. In this manner, attempts are made to help patients learn to anticipate future difficulties, develop plans for adaptive responding, and adjust their behaviour accordingly.

The efficacy of CBT in treating various chronic pain disorders has been demonstrated in numerous studies and has been reviewed in numerous reviews and metaanalyses.^{11,25–27} There is a wealth of evidence that CBT can help restore function as well as reduce pain and disability-related behaviours.^{11,25} Although CBT was found to be helpful for numerous individuals, there are some for whom CBT is not beneficial. Investigators are just beginning to explore different aspects of CBT to answer the question, what works for whom?^{28–30}

With this overview of the cognitive-behavioural perspective, we now discuss specific techniques that can be incorporated with CBT when treating chronic pain patients. The primary objective of these techniques is enhancement of patients' sense of self-efficacy by increasing a sense of control to

combat the feelings of helplessness and demoralization often felt by people with chronic pain.

Motivational Interviewing

Motivational interviewing was initially developed for substance abusers³¹; however, it has been adapted to chronic pain patients.³² Tasks are tailored to specific postulated stages of change. Learning and accepting self-management requires a significant cognitive shift by chronic pain patients; thus, a clinician needs to be aware of an individual's readiness to undertake the necessary steps. Most pain patients adhere to a biomedical model where their symptoms are closely aligned with physical pathology. However, as pain persists, some people become aware of how factors such as emotional stress impact their pain³³; therefore, they might entertain the possibility that they can learn and use self-management techniques to help them adapt to life with a chronic pain condition. Other people with chronic pain have difficulty acknowledging the role of psychological factors. The stage of acceptance of self-management is important, as those unready for the use of psychological techniques will tend to avoid and dismiss such methods.

In the precontemplation stage, people with chronic pain have not yet begun to consider changing, owing to a purely physical view of pain. They assume a passive role and rely on the health care provider to provide the appropriate treatment. The clinician's role is fostering acknowledgement of risks and problems owing to passivity and inactivity—problems such as increased pain and physical deconditioning.³¹

In the contemplation stage, people with chronic pain acknowledge the risks associated with inactivity and passivity. The clinical goal at this stage is to assist the patient to realize that the risks of inactivity outweigh the perceived benefits.

When the patient is ready to become more active (preparation stage), the clinician helps the patient outline appropriate structured physical activities in which the individual is willing to participate. Finally, in the action stage, the clinician helps the individual increase activity. This is followed by maintenance, geared toward the individual's ongoing motivation and commitment.³¹

Clinicians can encourage transition to different stages by providing motivational statements, listening with empathy, asking open-ended questions, providing feedback and affirmation, and handling resistance.³¹ Motivational interviewing should be thought of not as a treatment itself but as a general framework for preparing individuals for treatment and for adhering within the cognitive-behavioural perspective, which can be readily used with CBT. Motivational interviewing is one means of fostering motivation for self-control. Success using various techniques will directly reinforce

feelings of self-efficacy.³⁴ Thus it is of central importance to direct practice and attention to the usefulness of these methods in improving quality of life in people with chronic pain despite the presence of noxious symptoms that cannot be totally eliminated. The assessment process³⁵ should help the therapist determine an individual's motivation for the use of biomedical approaches.

Relaxation

There are numerous relaxation techniques. The literature is inconsistent as to which techniques are the most effective. Moreover, the different components may be synergistic. The important message to the patient is that there is a broad spectrum of approaches available and no one method is more efficacious. It is most important to help patients learn which technique(s) are most helpful for them by trying a variety. Clinicians may also note that no one technique is effective for all people all of the time; hence, knowledge of a range of methods may be the best approach. It is important to acknowledge that these methods are skills that require practice to become more proficient. In this section, we provide a brief overview of some of the most popular methods.

Meditation

Meditation is defined as the "intentional self-regulation of attention,"^{36,p456} a systematic inner focus on particular aspects of inner and outer experience.³⁷ Meditation was originally developed within a religious or spiritual context and held as the ultimate goal of spiritual growth, ending suffering, personal transformation, or transcendental experience.³⁸ However, as a health care intervention, it has been taught effectively regardless of patients' cultural or religious backgrounds.^{39,40}

There are many forms of meditation. We will describe 2 extensively researched general approaches: transcendental meditation and Zen or mindfulness meditation.⁴¹ Transcendental meditation requires concentration; it involves focus on any one of the senses, like a zoom lens, on a specific object. For example, the individual often repeats a silent word or phrase (mantra) with the goal of transcending the ordinary stream of thought.^{38,42} Mindfulness meditation is the opposite of transcendental meditation in that its goal is attempting awareness of the whole perceptual field, like a wide-angle lens. Thus it incorporates focused attention and whole field awareness in the present moment. For example, the individual observes, without judgment, thoughts, emotions, sensations, and perceptions as they arise moment by moment.^{39,43} Banadonna⁴⁴ proposed that individuals with chronic illness have an altered ability to concentrate; therefore, transcendental meditation may be less useful than mindfulness meditation when one is sick.

Mindfulness meditation reframes the experience of discomfort in that physical pain or suffering becomes the object of meditation. Attention and awareness of discomfort or suffering is another part of human experience; rather than to be avoided, it is to be experienced and explored.⁴⁴ Studies have found that mindfulness-based interventions have decreased pain symptoms, increased healing speed, improved mood, decreased stress, contained health care costs, and decreased visits to primary care.^{38,45}

Meditation has captured the attention of medicine, psychology, and neurocognitive sciences. In part, this is due to experienced meditators demonstrating reduced arousal to daily stress, better performance of tasks that require focused attention, and other health benefits.^{46,47} Lazar et al⁴⁶ found that long-term meditation in Western practitioners showed increased cortical thickness in areas related to somatosensory, auditory, visual, and interoceptive processing. They found thickening in right Brodman's Areas 9 and 10, which has been shown to be involved in the integration of cognition and emotion. Meditation may be useful for chronic pain patients owing to the reciprocal relation between stress and pain symptoms. Higher alpha brainwave activity was found to have beneficial health effects as well as to promote a general sense of well-being.⁴⁸⁻⁵⁰ Furthermore, gamma wave activity is the synchrony of areas of the brain communicating with each other, and research on the effects of meditation on gamma wave activity⁴⁷ demonstrates meditation can be beneficial for people with chronic pain owing to dysregulation within the hypothalamo-pituitary-adrenal axis and autonomic nervous system.

Biofeedback

Biofeedback is a self-regulatory technique. The assumption regarding biofeedback treatment is that the level of pain is maintained or exacerbated by autonomic nervous system dysregulation, which is believed to be associated with the production of nociceptive stimulation. The objective of biofeedback is to teach people to exert control over their physiological processes to assist in reregulating the autonomic nervous system. When people are treated with biofeedback, they are attached by surface electrodes to equipment that is linked to a computer that transforms and records physiological responses. These monitored physiological processes can include skin conductance, respiration, heart rate, heart rate variability, skin temperature, brainwave activity, and muscle tension. The biofeedback equipment conveys physiological responses as visual or auditory signals that the individual can observe on a computer monitor. In this way, the physiological information is fed back. With practice, individuals learn to control and change their physiological responses by learning to manipulate the auditory or visual signals by their own efforts. In addition to the physiological changes

accompanying biofeedback, patients are provided with a sense of control over their bodies. Given the high levels of helplessness observed in people with chronic pain problems, the perception of control may be as important as the actual physiological changes observed.

Biofeedback has been used successfully to treat numerous chronic pain states such as headaches, back pain, chronic myofascial pain, temporomandibular disorders, irritable bowel syndrome, and fibromyalgia, either as primary treatment or within the broader context of CBT integrated within rehabilitation programs.^{38,51} Examples of prominent forms of biofeedback include electromyographic biofeedback, in which patients, for example with tension headaches, are provided with information feedback to them from the physiological recordings and taught to manipulate the tension in their frontalis muscle (or other muscles, for example splenius capitis). Patients with migraine are provided with thermal feedback. They are instructed to warm their hands using visual or auditory temperature biofeedback cues. Also, heart rate variability biofeedback demonstrated some preliminary results in improving depression, pain, and functioning in fibromyalgia patients.⁵²

Recently, real-time functional magnetic resonance imaging has been used as a sophisticated source of biofeedback to train participants to control activation in the rostral anterior cingulate cortex. This brain region is reputedly involved in pain perception and regulation. When the participants deliberately induced changes in the rostral anterior cingulate cortex, there was a corresponding change in the perception of pain.⁵³

The actual mechanisms involved in the success of biofeedback are still unknown; however, a general sense of relaxation is an important feature of biofeedback. It is not clear whether the alteration of specific physiological parameters putatively associated with pain is the most important ingredient of biofeedback, compared with the broader relaxation and sense of control created.

Guided Imagery

Guided imagery can be a useful method for helping people with pain to relax, achieve a sense of control, and distract themselves from pain and accompanying symptoms. This modality involves the generation of different mental images, evoked either by oneself or with the help of the practitioner. It overlaps with different relaxation techniques and hypnosis. Although guided imagery has been advocated as a stand-alone intervention to reduce presurgical anxiety and postsurgical pain, and to accelerate healing,⁵⁴ it is most often used in conjunction with other treatment interventions such as relaxation and within the context of CBT.

With guided imagery, using the capacities of visualization or imagination, individuals are asked to evoke specific images that they find pleasant and engaging. In this way, a detailed representation that is tailored to the individual can then be created. When patients with chronic pain are feeling pain or are experiencing pain exacerbation, they can use imagery with the goals to redirect their attention away from their pain and achieve a psychophysiological state of relaxation.

The most successful images involve all of the senses (vision, sound, touch, smell, and taste). However, some people can have difficulty generating images and may find it helpful to listen to a taped description or purchase a poster that they can focus their attention on to assist their imagination.

Hypnosis

Hypnosis has been defined as a natural state of aroused attentive focal concentration coupled with a relative suspension of peripheral awareness. There are 3 central components in hypnosis: absorption, or the intense involvement in the central object of concentration; dissociation, where experiences that would commonly be experienced consciously occur outside of conscious awareness; and suggestibility, in which individuals are more likely to accept outside input without cognitive censoring or criticism.⁵⁵

Hypnosis has been used as a treatment intervention for pain control at least since the 1850s. It has been shown to be beneficial in relieving pain for people with headache, burn injury, arthritis, cancer, and chronic back pain.⁵⁶⁻⁵⁸ As with relaxation techniques, imagery, and biofeedback, hypnosis is rarely used alone in chronic pain, although it has been used as a solo psychological model with some success with cancer patients⁵⁹; practitioners often use it concurrently with other treatment interventions.

A metaanalysis⁵⁷ suggests an overall benefit of the addition of hypnosis to nonhypnotic pain management strategies, although this may be mediated by an individual's level of hypnotic suggestibility. Further, there are discrepancies in the literature regarding the methods used to induce hypnosis, making it difficult to accurately evaluate the efficacy of this intervention.⁵⁹ Based on systematic reviews, Patterson and Jensen^{56,58} suggested that hypnosis has more utility in the treatment of acute pain than chronic pain. Thus the degree to which hypnosis is effective, above and beyond other interventions and for which populations, is yet to be determined.

The techniques and modalities described can be readily integrated with more comprehensive rehabilitation programs. They can be useful complements to physical therapy, medication management, and rehabilitation by providing patients with something they can do when pain flares up as well as being a routine part of a self-management program. They

convey a sense of hopefulness as an antidote to the more common feelings of helplessness and dependency.

Efficacy of Psychological Approaches

The first reported trial of behavioural treatment for chronic pain was published in 1968 by Fordyce et al.⁶⁰ Since that initial publication, there have been numerous clinical trials evaluating the efficacy of various psychological treatment approaches and modalities (such as cognitive-behavioural therapy, biofeedback, and hypnosis) for chronic pain. Psychoeducational and multidisciplinary pain management programs approaches often or usually incorporate some combination of psychological treatments based on behavioural principles within comprehensive rehabilitation programs.

In early studies, the questions that most interested researchers and practitioners were whether behavioural approaches were effective and if the efficacy of these treatments were comparable to other therapeutic options. Although there was at first a lack of well-controlled RCTs, or dismantling studies, and the metaanalytic techniques used needed refinement, the clinical outcomes always tended to support the use of psychological approaches and treatment modalities usually included in comprehensive rehabilitation programs.^{61,62} Although only modest improvements in pain-related outcomes were observed, analgesic medication use, physical incapacity, health care use, and disability rates showed marked reductions.⁶³⁻⁶⁷

With the basic questions of efficacy addressed, increased availability of RCTs, and refined metaanalytic techniques, research began focusing on variables that influence outcomes or that change with treatment. Several metaanalyses⁶⁸⁻⁷⁰ reviewed the evidence of the effectiveness of the psychological treatments with samples of chronic pain patients with diverse patient samples. The results of these metaanalyses with adult patients came to somewhat similar conclusions—as a group, psychological treatments have modest benefits on improving pain, physical, and emotional functioning. For example, van Tulder et al⁷⁰ concluded that behavioural treatments, compared with placebo or wait-list control, were moderately effective for low back pain intensity in more than one-half of the studies they reviewed; however, the evidence was inconclusive regarding which behavioural technique was more effective, compared with another, and there was weak evidence that they were more effective, compared with usual care.

In the case of migraines, Campbell et al⁷¹ concluded that all behavioural treatments (except hypnosis) were effective in the prevention of migraines and if used concomitantly with medications to augment relief. The authors concluded that the evidence for hypnosis was incomplete. Nestorovic and Martin⁷² also found that all biofeedback methods were

effective for chronic headaches. Moderators (factors that affect outcome but are not part of the treatment process) for follow-up outcomes included headache years, study validity, and treatment setting. Based on the outcomes of published studies of treatment of children and adolescents with chronic headache, Eccleston⁷³ determined that there was strong evidence that behavioural treatments were effective in reducing severity and frequency of chronic headache pain; however, the data was insufficient regarding mood, function, or disability, and there was a nonsignificant trend in favour of behavioural treatments used for abdominal pain.

Recently, Turner et al⁷⁴ found that the mediators of improvement in pain and activity one year following CBT were cognitive variables including patients' perceptions of control, disability, self-efficacy, harm, catastrophizing, and rumination. They also found moderators that predicted therapeutic change were number of pain sites, depression, somatization, rumination, catastrophizing, and stress existing before treatment. These data confirm the need to address psychosocial as well as physical aspects of the chronic pain experience to obtain positive results, even in the absence of cure.

It is important to acknowledge that the modest reduction in pain severity obtained with psychological interventions and with comprehensive rehabilitation studies observed in the various metaanalyses were comparable to those observed with more traditional pharmacological and procedural treatment modalities.² This observation suggests that none of the most commonly prescribed treatment regimens, by themselves, are sufficient to eliminate pain and to have a major impact on physical and emotional functioning. This is hardly surprising given the complexity of chronic pain. A more realistic approach will likely be one that combines pharmacological, physical, and psychological components, with the balance among these tailored to each patient's needs. As one author opined in an editorial regarding combinations of treatment for chronic pain, "Sometimes 1 + 1 does = 3."⁷⁵

Concluding Remarks

For the individual experiencing chronic pain, there is a quest for relief that remains elusive, leading to feelings of helplessness, hopelessness, demoralization, and depression. Chronic pain confronts the individual, not only with the stress created by pain but also with a cascade of ongoing stressors that compromise all aspects of the sufferer's life. Living with chronic pain requires considerable emotional resilience and tends to deplete emotional reserve, taxing not only the pain sufferer but also the significant others' capacity to provide support.

There is much evidence to demonstrate that psychological factors can interfere with or hinder an individual's ability to cope with the pain experience. As a result, psychological assessment and intervention are becoming standard in chronic

pain treatment. Psychological treatments focus on the emotional distress and maladaptive behaviours accompanying chronic pain, and provide education and training in the use of cognitive and behavioural techniques that may reduce perceptions of pain and related disability. Psychological principles have played a major role in the understanding and treatment of people with pain, and mental health professionals have an important function in interdisciplinary pain rehabilitation programs as clinicians and researchers.

None of the treatments described are successful in eliminating pain; consequently, most people have to adapt to the presence of chronic pain and learn self-management in the face of persistent pain and accompanying symptoms. The various psychological interventions described provide a general overview of different treatment strategies. Treatment with cognitive-behavioural therapy alone or within the context of an interdisciplinary pain rehabilitation program has the greatest empirical evidence for success. At this point, it seems prudent to use psychological treatments in combination with traditional medical interventions.

Currently, few data are available that are consistent in identifying the characteristics of people who would most likely benefit from any of the pain treatment methods described, although some studies suggest that tailored treatments are associated with more improved symptoms than standard treatment.⁷⁶⁻⁷⁸ Studies are needed that answer the question, What treatments delivered in what ways are most effective for people with what set of characteristics with the least iatrogenic complications and adverse events?²⁷ Answers to this question will permit more clinically effective and more cost effective ways to treat the difficult problem of chronic pain.

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Résumé : Les approches psychologiques du traitement des patients souffrant de douleur chronique — quand pilules, scalpels et aiguilles ne suffisent pas

Arrière-plan : La douleur chronique est un problème prévalent et coûteux qui dépasse le traitement adéquat. La douleur persistante affecte tous les domaines de la vie des gens et en l'absence d'un remède, le succès reposera lourdement sur l'adaptation aux symptômes et l'auto-prise en charge.

Méthode : Nous examinons les modèles psychologiques qui ont été utilisés pour conceptualiser la douleur chronique — psychodynamique, comportemental (répondant et opérant), et cognitivo-comportemental. Les traitements basés sur ces modèles, dont la compréhension de soi, le renforcement extérieur, la technique d'entrevue motivationnelle, la relaxation, la méditation, la rétroaction biologique, l'imagerie dirigée, et l'hypnose sont décrits.

Resultats : Sur la perspective cognitivo-comportementale car la majeure partie de la recherche soutient l'efficacité de cette approche auprès des patients souffrant de douleur chronique. Surtout, nous différencions la perspective cognitivo-comportementale des techniques cognitives et comportementales, et nous suggérons que la perspective sur le rôle des croyances, attitudes et attentes des patients dans le maintien et l'exacerbation des symptômes est plus importante que les techniques spécifiques. Les techniques sont toutes axées sur l'incitation à la maîtrise de soi et à l'auto-prise en charge qui encourageront le patient à remplacer ses sentiments de passivité, de dépendance et d'impuissance par l'activité, l'indépendance et l'esprit d'initiative.

Conclusions : Les facteurs psychosociaux et comportementaux jouent un rôle significatif dans l'expérience, le maintien et l'exacerbation de la douleur. L'auto-prise en charge est un complément important des approches biomédicales. La thérapie cognitivo-comportementale seule ou dans le contexte d'un programme interdisciplinaire de réhabilitation de la douleur présente les meilleures données probantes empiriques de réussite. Puisqu'aucun des régimes de traitement les plus fréquemment prescrits ne suffit à éliminer la douleur, une approche plus réaliste combinerait vraisemblablement des composantes pharmacologiques, physiques et psychologiques adaptées aux besoins de chaque patient.

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