Assessment and Treatment of Psychosocial Comorbidities in Patients With Neuropathic Pain

DENNIS C. TURK, PhD; JOSEPH AUDETTE, MD; ROBERT M. LEVY, MD, PhD;
SEAN C. MACKEY, MD, PhD; AND STEVEN STANOS, DO

Chronic neuropathic pain is a prevalent problem that eludes cure and adequate treatment. The persistence of intense and aversive symptoms, inadequacy of available treatments, and impact of such pain on all aspects of functioning underscore the important role of several psychosocial factors in causing, maintaining, and amplifying the perception of pain severity, coping adequacy, adaptation, impaired physical function, and emotional distress responses. Moreover, these factors have an influential role in response to treatment recommendations. In this article, we (1) review the prevalence and nature of emotional distress, (2) describe and propose methods for screening and comprehensive psychosocial assessment, and (3) review evidence supporting the potential complementary role of psychosocial treatments of patients with chronic pain. The cognitive-behavioral perspective and treatment approach are emphasized because the greatest amount of evidence supports their benefits. Published results of psychological treatments are modest; however, the same indictment can be placed on currently available pharmacological, medical, and interventional treatments for patients with chronic pain. We note the limited research on the effectiveness of psychological treatment specifically applied to patients with chronic neuropathic pain but suggest that it is reasonable to extrapolate from successful trials in other types of chronic pain. Furthermore, psychological approaches should not be viewed as alternatives but rather should be integrated as part of a comprehensive approach to the treatment of patients with chronic neuropathic pain.

Mayo Clin Proc. 2010;85(3)(suppl):S42-S50

CBT = cognitive-behavioral therapy; SF-MPQ = Short-Form McGill Pain Questionnaire

Chronic neuropathic pain is a prevalent problem that eludes successful treatment. Despite increasing knowledge of the neurophysiologic factors underlying neuropathic pain and advances in pharmacological and invasive treatments, no cure is currently available for most patients. Although newer subclasses of medications (eg, anticonvulsants and antidepressants) and topical and transdermal preparations have expanded clinicians' armamentarium, on average these medications reduce pain severity by 30% to 40%, and often this reduction is achieved in less than 50% of patients treated.¹ Even when medications and invasive procedures effectively reduce pain, they often do not produce concomitant improvements in physical and emotional functioning.

There is also a likelihood that available treatments for chronic pain will result in serious complications or adverse effects for a large percentage of patients. For example, premature termination rates from drug trials because of lack

of efficacy or adverse events often exceed 30%,¹ and more than 40% of patients enrolled in long-term, open-label extensions of clinical trials for opioids terminate participation.² Furthermore, opioids may be less effective in the setting of neuropathic pain and have risk of misuse and abuse that may exceed 40%.³⁻⁵ In some studies, investigators reported that more than 40% of patients with implanted devices for pain control experience adverse events⁶; up to 67.7% of patients treated with lumbar surgery for back pain reported that their pain was worse after surgery,⁷ and at least moderate adverse effects have been reported to occur in 30% to 61% of all patients who undergo spinal manipulations.⁸ These findings do not argue against the use of such treatments but serve as reminders of limitations and possible harmful effects.

The mean duration of pain in patients who seek treatment at chronic pain treatment facilities is approximately 7 years.⁹ Consequently, all domains of their lives may have been compromised for a substantial amount of time. It is hardly surprising that levels of emotional distress for patients with persistent pain are high. Estimates suggest that at least 1 current psychiatric diagnosis is present in 59% of patients with chronic back pain treated at pain facilities and at least 1 lifetime psychiatric diagnosis is present in 77% of these patients.¹⁰ In contrast, community estimates are 15% for at least 1 current psychiatric diagnosis and 29% to 38%

From the Department of Anesthesiology & Pain Medicine, University of Washington, Seattle (D.C.T.); Department of Pain Medicine, Harvard Vanguard Medical Associates, Boston, MA (J.A.); Department of Neurological Surgery, Northwestern University, Chicago, IL (R.M.L.); Pain Management Division, Stanford University School of Medicine, Stanford, CA (S.C.M.); and Center for Pain Management, Rehabilitation Institute of Chicago, Chicago, IL (S.S.).

Dr Turk has received grant/research support from Endo Pharmaceuticals, Johnson & Johnson, and Philips Respironics and has served as a consultant for Eli Lilly, Johnson & Johnson, Philips Respironics, and SK Lifescience. Dr Audette has served on the speakers' bureau for Allergan, Endo Pharmaceuticals, and Johnson & Johnson. Dr Levy has received grant/research support from St Jude Medical Neuromodulation and has served as a consultant for St Jude Medical Neuromodulation, Medtronic, Codman, Stryker, and Bioness. Dr Mackey has no financial arrangement or affiliation with a corporate organization or a manufacturer of a product discussed in this supplement. Dr Stanos has received grant/research support from Ortho-McNeil; has served as a consultant for Abbott Labs, Eli Lilly, Endo Pharmaceuticals, King, and Ortho-McNeil; and is on the speakers' bureau for Endo Pharmaceuticals, Eli Lilly, Ortho-McNeil, Pfizer, King, and Forest.

Address correspondence to Dennis C. Turk, PhD, Department of Anesthesiology & Pain Medicine, Box 356540, University of Washington, Seattle, WA 98195 (turkdc@u.washington.edu).

© 2010 Mayo Foundation for Medical Education and Research

FIGURE. Impact of diabetic painful neuropathies (DPNs) on physical and mental health status (N=255). Adapted from *J Pain Symptom Manage*,¹⁶ with permission.

for at least 1 lifetime psychiatric diagnosis.¹¹ Other reports suggest that approximately 33% of patients evaluated at tertiary care pain facilities experience anxiety disorders¹² and between 40% and 60% of people meet criteria for a depressive disorder.¹³ Given the information and data on the limited efficacy of treatments available, 1 group raised the question: “Why aren’t all patients [with chronic pain] depressed?”¹⁴

One must be cautious, however, about relying on diagnostic criteria for psychiatric disorders in patients with neuropathic pain. Many psychiatric diagnoses in the American Psychiatric Association’s *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*¹⁵ have symptoms that overlap with symptoms of medical conditions. Moreover, somatic symptoms that can be attributed to pain and the medication being taken overlap with clinical depression (eg, sleep disturbance, motor retardation, loss of energy, and change in appetite and weight).

The prevalence estimates of psychiatric comorbidities previously noted raise the question of whether having a chronic medical condition and not specifically pain increases emotional distress. Gore et al¹⁶ presented data that directly compared emotional and physical functioning of community samples of people with diabetes mellitus and individuals with diabetic painful neuropathies (Figure). On each measure, people with diabetes reported diminished emotional functioning. Moreover, those with diabetic painful neuropathies identified even greater decrements in functioning and higher levels of emotional distress than the community sample, but more important-

ly when compared with people with diabetes who did not have diabetic painful neuropathies. These data raise an important question: Are these emotional factors causal or reactive? That is, patients may have a premorbid history of emotional problems, existing psychiatric and psychosocial problems may exacerbate the presence of chronic pain and related symptoms, or psychiatric and psychosocial problems may evolve in response to a chronic, painful condition. Regardless, the rates of emotional distress are high and need to be considered when the physician develops a comprehensive treatment plan in which both physical and psychological symptoms are treated.

The average age of patients treated at pain facilities is 44 years, and the mean duration of reported pain is 7 years.⁹ Thus, before pain onset, patients’ histories spanned 37 years; detailed exploration of these histories is important in understanding how people respond to their current symptoms. Moreover, people with pain live in a social context in which the significant people in their lives likely have a large influence on their adaptation to chronic pain. These facts, along with the others previously described, underscore the need to attend to psychosocial and behavioral factors, as well as neurophysiological factors, in treating patients with neuropathic pain.

Patients with neuropathic pain and psychological comorbidities create diagnostic dilemmas; such patients require additional treatment consideration to optimize outcomes. Regardless of whether they are causes or effects, psychiatric comorbidities and psychosocial problems can exacerbate and negatively affect the severity of pain, the course of the disease, patients’ adaptation, and responses

TABLE 1. **Brief Psychosocial Screening: ACT-UP**

1. Activities: How is your pain affecting your life (ie, sleep, appetite, physical activities, relationships)?
2. Coping: How do you deal/cope with your pain (what makes it better/worse)?
3. Thinking: Do you think your pain will ever get better?
4. Upset: Have you been feeling worried (anxious)/depressed (down, blue)?
5. People: How do people respond when you have pain?

From Turk DC, Robinson JP. Multidisciplinary assessment of patients with chronic pain. In: Fishman SM, Ballantyne JC, Rathmell JP, eds. *Bonica's Management of Pain*. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2010:294, used with permission.

to treatment. Thus, we propose that successful treatment of most patients with chronic neuropathic pain requires an integrated, multimodal approach, rather than individual pharmacological and nonpharmacological therapies.

These observations of the efficacy of available treatments and duration of pain have led to several conclusions: (1) the persistence of pain, even if reduced, will continue in most people; (2) pain, especially persistent pain, will continue to affect all domains of people's lives; (3) psychosocial and behavioral factors will play an important role in the experience, maintenance, and exacerbation of pain; and (4) in the absence of cure, success will depend a great deal on adaptation to symptoms and self-management that complements biomedical interventions. In the remainder of this article, we describe strategies for assessing patients with neuropathic pain and review psychological approaches and interventions that can be used to help patients with chronic neuropathic pain, extrapolating from the chronic pain literature in general.

ASSESSMENT OF PSYCHOSOCIAL FACTORS

On the basis of a biopsychosocial perspective, clinicians should assess not only the physical source of the pain through examination and diagnostic tests but also the patient's mood, fears, expectations, coping efforts, and resources; responses of significant others; and the impact of pain on the patient's life. In short, the clinician must evaluate the whole patient, not just the physical symptoms or the site of pain. Regardless of whether a neuroanatomic basis for the pain can be documented or whether psychosocial problems preceded or resulted from the pain, a comprehensive evaluation process will help identify how biomedical, psychosocial, and behavioral factors interact to influence the nature, severity, and persistence of symptoms and disability.

Psychosocial assessment of patients with neuropathic pain does not differ from assessment of patients with chronic pain except that the clinician must ask about the

unique characteristics of nerve-related pain. Psychosocial assessment addresses the specific behaviors (responses to the patient's symptoms by significant others, such as family members or coworkers), cognitions (eg, beliefs, attitudes, expectations, interpretation of the meaning, and implications of symptoms), and mood (eg, anxiety and depression), each of which synergistically contributes to the subjective experience of pain. This type of information should be included as the basis for developing a comprehensive treatment plan. The set of questions with the acronym ACT-UP (Activities, Coping, Thinking, Upset [mood], People responses; Table 1) is an efficient method to cover important psychosocial and behavioral areas. Additional questions may follow, depending on patients' responses, and referral for a more comprehensive psychological evaluation may be appropriate.

PURPOSES OF PSYCHOLOGICAL ASSESSMENT

Generally, a referral for psychological evaluation may be indicated in the following circumstances: (1) when disability greatly exceeds what would be expected on the basis of physical findings alone, (2) when patients make excessive demands on the health care system, (3) when patients persist in seeking medical tests and treatments that are not indicated, (4) when patients display significant emotional distress (eg, depression or anxiety), or (5) when patients display evidence of addictive behaviors or continual non-adherence to the prescribed treatment regimen. Before interventional pain procedures, such as spinal cord stimulation or intrathecal drug administration, are considered, a formal psychological evaluation should be considered. General areas that are covered in a more extensive psychological interview of patients with pain are outlined in Table 2.

INTERVIEWS

A psychological interview with patients is typically semi-structured; however, a structured psychiatric interview¹⁷ can be incorporated as a tool to examine psychopathological conditions. A psychological interview needs to extend beyond assessing psychopathologic conditions because its primary purpose is to assess a wide range of psychosocial factors (not just psychopathologic factors) related to a patient's symptoms, maladaptive behaviors, and disability.

When interviewing a patient with chronic pain, the clinician should focus not only on gathering information provided by the patient but also on observing the patient's pain behaviors and the manner in which information is conveyed. When possible, it is valuable to observe how significant others respond to the patient's behavioral presentation

to better understand their beliefs and expectations about pain because these factors may influence how significant others respond to the patient and will affect the patient's behaviors. Patients' beliefs about the cause of their symptoms, their symptoms' trajectory, and past or potential beneficial treatments will influence emotional adjustment and adherence to therapeutic interventions. A habitual pattern of maladaptive thoughts may contribute to a sense of hopelessness, dysphoria, and unwillingness to engage in recommended treatments and activities. These reactions, in turn, deactivate the patient and severely limit his or her coping efforts. The clinician should also determine both the patient's and significant others' expectations and goals for treatment and their future. An expectation that pain will be eliminated completely may be unrealistic, and this issue needs to be addressed to prevent discouragement when pain recurs or persists. Helping the patient to set appropriate and realistic goals is important in pain rehabilitation because it requires the patient to attain a more complete understanding of chronic pain that extends beyond the traditional dualistic medical model that rigidly separates mind from body.

To help patients with neuropathic pain better understand the psychosocial aspects of their pain, clinicians should focus patients' attention on their reports of specific thoughts, behaviors, emotions, and physiologic responses that precede, accompany, and follow pain episodes or exacerbations, as well as on the environmental conditions and consequences associated with cognitive, emotional, and behavioral responses in these situations. Clinicians should also attend to the following to establish salient features: the temporal association of these cognitive, affective, and behavioral events; their specificity vs generality across situations; and the frequency of their occurrence. Furthermore, the clinician needs to seek information that will assist in the development of potential alternative responses, appropriate goals for the patient, and possible reinforcers for these alternatives.

Patients with chronic pain are often prescribed a variety of medications not only for their pain but also for the myriad comorbid symptoms that may be part of their diagnosis. The clinician needs to discuss a patient's medications because many pain medications are associated with adverse effects that may mimic emotional distress. For example, clinicians should be familiar with adverse effects that result in fatigue, sleep difficulties, and mood changes to avoid the misdiagnosis of depression. A general understanding of commonly used medications for neuropathic pain is important, and when possible, the goal should be to simplify the regimen by finding a single agent that can positively influence both pain and other symptoms, such as mood and sleep.

TABLE 2. **Areas Covered in Psychological Interviews**

Patients' perceptions about the cause of their pain
Patients' experience of pain (how often, when, and where it occurs)
Impact of pain on daily activities, including sleep
Impact of pain on interpersonal relationships
Level and nature of emotional distress and psychological dysfunction
Current source of stress and conflict
Manner in which patients cope with impairments and symptoms
Alcohol and substance abuse history and current use
Ways patients communicate pain and distress to others
Response to patients' pain and distress by significant others
Social history
Educational and work history and current work (including homemaking and household chores)
Patients' compensation status and involvement in litigation
Patients' concerns and expectation for their pain, disability, and treatments
Adherence to prescribed treatments
Patients' goals for treatment

STANDARDIZED ASSESSMENT INSTRUMENTS

In addition to interviews, a number of assessment instruments have been designed to evaluate patients' attitudes, beliefs, and expectations about themselves, their symptoms, and the health care system.¹⁸ Easily administered, standardized instruments assess a wide range of behaviors, obtain information about behaviors that may be private (eg, sexual relations) or unobservable (eg, thoughts and emotional arousal), require less clinician time, and contain normative data that allow comparison to reference groups. These instruments should not be viewed as alternatives to interviews, but as complements because they can suggest issues to be addressed in more depth during an interview or by other methods.

ASSESSMENT OF PAIN

Self-report measures of pain often ask patients to quantify their pain by providing a single, general rating of pain: "Is your usual level of pain mild, moderate, or severe?" or "Rate your typical pain on a scale from 0 to 10, in which 0 equals no pain and 10 is the worst pain you can imagine." Several simple methods can be used to evaluate current pain intensity: numerical rating scales, verbal rating scales, and visual analog scales. The numerical rating scales may be the most useful in clinical studies. However, the limitations of these unidimensional measures must be recognized because they are nonlinear across their range and fail to reflect much of the complexity of the pain experience.

PAIN QUALITY

In addition to intensity, pain is known to have different sensory and affective qualities that can be measured to de-

scribe more fully an individual's pain experience. Because the efficacy of pain treatments can vary for different pain qualities, these measures can identify treatments that are efficacious for certain types of pain but not for overall pain intensity. For example, the Short-Form McGill Pain Questionnaire (SF-MPQ)¹⁹ assesses 15 sensory and affective pain descriptors, and its sensory and affective subscales have demonstrated responsiveness to treatment in a number of clinical trials.^{20,21} Recently, a revised version of the SF-MPQ, the SF-MPQ-2, has been published.²² The major advantage of the SF-MPQ-2 is the addition of descriptors specific to neuropathic pain. In addition, the format has been modified from a 0- to 3-point scale to a 0- to 10-point scale, providing increased opportunities to detect small changes that may occur after treatment and activities.

PAIN MODIFIERS

For most people with neuropathic pain, pain severity varies. Thus, it is useful to ask the patient what he or she thinks amplifies (eg, specific activities, circumstances that contribute to exacerbation of pain, or time of day) and alleviates the pain (eg, medication, rest, temperature, exercise, or distraction).

ASSESSMENT OF EMOTIONAL DISTRESS

Diagnosing the cause of emotional distress in people with chronic pain is a challenge because pain-related symptoms, such as fatigue, reduced activity level, decreased libido, appetite change, sleep disturbance, weight gain or loss, and memory and concentration deficits, are also considered “vegetative” symptoms of depressive disorders. Therefore, improvements or deterioration in such symptoms can be a result of changes in pain, emotional distress, or both.

The Beck Depression Inventory^{23,24} and the Profile of Mood States (which assesses 6 mood states—tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment—and also provides a summary measure of total mood disturbance)²⁵ are standard measures that have well-established reliability and validity in assessing symptoms of depression and emotional distress. These measures have been recommended to assess emotional distress of participants enrolled in clinical trials.²⁶

ASSESSMENT OF OVERT EXPRESSIONS OF PAIN

As noted previously, patients display a broad range of pain behavior responses that communicate to others that they are experiencing pain, distress, and suffering. Although

there is no one-to-one relationship between these pain behaviors and self-reports of pain, experience suggests that they are at least modestly correlated. Informally, a health care professional can observe behaviors during an interview and examination. Because the patient knows he or she is being observed in these contexts, it is useful to observe behaviors in the waiting room, while the patient walks to the examination room, during history taking and physical examination, and when the patient exits. Additionally, the clinician should observe a patient's behavior in the presence of significant other(s) and observe the significant other(s)' responses to the behaviors. Variations in these behaviors in different situations should be noted.

Uses of the health care system and analgesic medication can be viewed as pain behaviors. Patients can record in a daily diary the frequency and quantity of medication they take during a specified interval, such as a week. Such information helps identify behavioral patterns in response to pain that the patient may not recall during interviews.

A diary may also help identify the antecedent (eg, anxiety or stress) and consequent events associated with pain intensity and medication use. Examining antecedents is useful for identifying patterns of medication use that may be associated with factors other than pain per se. Similarly, patterns of response to the use of analgesic may be identified, and the possible reinforcing role can be investigated.

ASSESSMENT OF FUNCTION

Self-report measures have been developed to assess patients' reports of their abilities to engage in a range of functional activities, such as being able to walk up stairs, lift specific weights, and perform activities of daily living. These measures are also designed to evaluate the severity of the pain experienced while these activities are being performed. A number of well-established, psychometrically supported generic (eg, Medical Outcomes Study 36-Item Short-Form Health Survey)²⁷ and pain-specific (eg, Brief Pain Inventory, Interference Scale²⁸ and Multidimensional Pain Inventory Interference Scale²⁹) measures of functional status are available and have been recommended for use in clinical trials.²⁶

In general, disease-specific measures are designed to evaluate specific effects of a disorder that may not be assessed by a generic measure. Generic measures often do not have the sensitivity to measure change resulting from treatment; this is particularly true for an individual patient. In these cases, the disease-specific measures are more sensitive to change. Disease-specific measures may be more

TABLE 3. **Psychological Perspectives and Treatments**

Treatment	Psychological perspectives
Insight-oriented and psychodynamic psychotherapy	Predicated on the belief that chronic physical pain may be somatic presentations of emotional distress, and nonconscious factors will influence both onset and maintenance of symptoms. As a set of evidence to support this, insight-oriented practitioners often cite data on prevalence of childhood physical and sexual abuse acknowledged by people reporting chronic pain. Primarily focus on early relationship experiences reconstructed within therapeutic relationship
Operant behavior therapy	Managed approach to behavior change using basic concepts and principles of behavioral psychology, particularly contingencies of reinforcement to reduce pain behaviors and to increase more appropriate ones
Cognitive behavior therapy	Primary focus on changing cognitive activity to achieve changes in behavior, thoughts, and emotions. Conversely, alteration in mood and behavior will influence each other and thoughts, providing a greater sense of control, feelings of resourcefulness, and hopefulness. Two broad classes of methods exist: (1) coping skills training and (2) cognitive therapy addressing maladaptive thoughts and behavior directly
Supportive counseling	Involves empathic listening and provides patients with encouragement. Acknowledges presence of emotional distress and the reality of the patient's plight
Relaxation	For example, autogenic training and progressive muscle relaxation
Meditation	Intentional self-regulation of attention, a systematic inner focus on particular aspects of inner and outer experience
Biofeedback	Involves measuring an individual's quantifiable bodily functions (eg, blood pressure, heart rate, skin temperature, sweat gland activity, muscle tension, electroencephalography) using noninvasive electrical devices that record and amplify physiologic signals and conveying information to patient in real time. Intent is to raise patient's awareness and conscious control of unconscious physiologic activities that may exacerbate pain. By providing the patient access to this physiologic information, biofeedback allows patients to attain control of physical processes previously considered automatic responses of the autonomic nervous system, possibly reducing pain

sensitive to the effects of treatment on function, but generic measures provide information about physical functioning and treatment benefits that can be compared across different conditions and studies.³⁰

PSYCHOLOGICAL TREATMENTS

Psychological treatments of chronic pain can generally be separated into theoretically based approaches and specific techniques. The most common theoretical approaches are operant conditioning and cognitive-behavioral therapy (CBT), whereas the most frequently used psychological techniques include supportive counseling, cognitive therapy, hypnosis, relaxation, biofeedback, and meditation (Table 3). Because the theoretically based approaches, especially CBT, which incorporates behavioral principles of operant conditioning, have been better researched than the specific techniques, we focus on them. Furthermore, the various psychological techniques can be used within a CBT perspective that incorporates the behavioral principles of operant conditioning.

OPERANT CONDITIONING

Operant conditioning is based on the principles of reinforcement, with the emphasis on modifying responses to maladaptive behaviors and, in the case of chronic pain, behaviors that consist of overt expressions of pain, distress, and suffering.³¹ From this behavioral perspective, pain is conceptualized as a subjective experience that can never

be observed directly. All that can be known about patients' pain is inferred from the connection among observable behaviors, such as limping, moaning, and ambulating in a guarded fashion; pain behaviors; and self-reports of pain. These observable behaviors elicit responses from others and clinicians, responses that can serve to reinforce and thereby maintain the behaviors. Conversely, failure to positively reward the behaviors can extinguish them. Thus, the operant conditioning perspective suggests that treatment is focused on changing the contingencies of reinforcement provided by external agents in response to behaviors indicating the presence of pain.

COGNITIVE-BEHAVIORAL THERAPY

Treatments based on operant conditioning within the CBT perspective do not focus on eliminating pain but rather on improving physical and emotional functioning despite pain. A range of behavioral and cognitive techniques is used to accomplish these primary objectives. Although CBT evolved from an operant conditioning model, emphasis is also placed on the role of patients' attitudes, beliefs, and expectations.³² Thus, targets of treatment are both responses from the environment, as in operant conditioning, and internal cognitive processes of patients, which are thought to influence their symptom perception and responses. Cognitive-behavioral therapy emphasizes using both behavioral and cognitive techniques (eg, relaxation and problem solving) to help patients shift from being passive, reactive, and helpless in the face of pain to being active and resourceful in coping with

their symptoms and their lives despite aversive symptoms. Furthermore, CBT emphasizes teaching patients to reconceptualize their thoughts about the meaning of their pain, replacing their more typical feelings of hopelessness, helplessness, and passivity. The expectation is that patients will gain mastery over their pain, improve their mood, increase activity, and reduce disability.

Distinguishing the cognitive-behavioral perspective from cognitive-behavioral techniques is important.³³ The cognitive-behavioral perspective is predicated on the assumption that people believe they are unable to function because of their pain and that they are helpless to improve their situation. Treatment goals focus on helping people with pain to realize that they can manage their problems and learn new skills so they can respond more adaptively after treatment is terminated.

The CBT approach typically combines stress management, problem solving, goal setting, pacing of activities, and relaxation. These skills can be integrated within a rehabilitation approach. Cognitive-behavioral techniques are woven into the fabric of treatment in an effort to enhance patients' sense of self-control. Biofeedback and hypnosis can be incorporated into CBT to facilitate and expand the set of self-management strategies available to a patient to modulate pain perceptions.

EFFICACY OF PSYCHOLOGICAL TREATMENTS

The first reported clinical trial of behavioral treatment of chronic pain was published by Fordyce et al³⁴ in 1968, although anecdotal reports about various psychological approaches date back hundreds of years. Since that initial publication, investigators have reported a large number of clinical trials evaluating the efficacy of various psychological treatment approaches and modalities, including CBT, biofeedback, and hypnosis, for a range of chronic pain diagnoses.^{35,36} These studies focused primarily on patients with musculoskeletal disorders or heterogeneous samples of chronic pain; the percentage of patients with neuropathic pain was unspecified.

The effectiveness of psychosocial treatments in patients with neuropathic pain conditions is limited to 3 small preliminary studies,³⁷⁻³⁹ each of which reports significant patient benefits with CBT and hypnosis. In one study, hypnosis, but not relaxation, significantly improved pain and physical functioning for up to 3 months after treatment.

Investigators who conducted meta-analyses and systematic reviews involving adult patients with chronic pain arrived at somewhat similar conclusions: as a group, psychological treatments have modest benefits on improving pain and physical and emotional functioning. However, evidence is inadequate for long-term efficacy

and somewhat contradictory for effects on vocationally relevant outcomes.^{35,36,40}

Mechanisms involved in successful psychological treatments have received some attention. For example, Turner et al⁴¹ found that mediators of improvement in pain and activity 1 year after CBT were cognitive variables, including patients' perceptions of control, disability, self-efficacy, harm, catastrophizing, and rumination. The investigators also found factors that predicted therapeutic change, including the number of pain sites, depression, somatization, rumination, catastrophizing, and stress that existed before treatment. Such data confirm the need to address the psychosocial and physical aspects of the chronic pain experience. Addressing both the psychosocial and the physical aspects is more likely to obtain positive and enduring results even in the absence of cure.

Although only modestly efficacious, psychosocial treatments typically have been used as an adjunctive modality with the most recalcitrant problems. The modest reduction in pain severity obtained with psychological interventions and comprehensive rehabilitation studies is comparable to that observed with more traditional pharmacological and procedural treatment modalities.¹ Evidence for the efficacy of psychological treatments on physical functioning is stronger than for pharmacological and invasive treatment.⁹ These observations suggest that none of the most commonly prescribed treatment regimens, by themselves, are sufficient to eliminate pain and substantially affect physical and emotional functioning in most patients with chronic pain, which is hardly surprising given the complexity of chronic pain. A more realistic approach will likely be one that combines pharmacological, physical, and psychological components, tailoring them according to individual patients' needs.

CONCLUSION

For the person experiencing chronic pain, the quest for relief often remains elusive, leading to feelings of helplessness, hopelessness, demoralization, and depression. People who experience chronic pain must confront not only the stress created by pain but also a cascade of ongoing stressors that may compromise all aspects of their lives. Living with chronic pain requires considerable emotional resilience; chronic pain tends to deplete emotional reserve and taxes not only the person experiencing pain but also the capacity of significant others to provide support.

A large body of evidence demonstrates that psychological factors can interfere with or hinder a person's ability to cope with the pain experience. As a result, psychologi-

cal assessment and intervention have become standard in chronic pain treatment. Psychological treatments focus on the emotional distress and maladaptive behaviors that accompany chronic pain; they also provide patients with cognitive and behavioral self-management strategies that may reduce their perceptions of pain and related disability and enhance their self-efficacy. Psychological principles have played a major role in understanding and treating people with pain; mental health care professionals have an important function in interdisciplinary pain rehabilitation programs.

Although psychological approaches and techniques have been found to be helpful for a number of individuals, these treatments have not proven to be beneficial for some people. Investigators are just beginning to explore different aspects of CBT to answer the question, "What works for whom?"^{42,43} Few available data 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 compared with standard treatment.⁴⁴⁻⁴⁷ For example, Thieme et al⁴⁶ found that patients with high levels of pain behaviors responded better to operant behavioral therapy than to CBT; conversely, patients with low levels of pain behavior responded better to CBT than to operant behavioral therapy. Additional studies are needed to determine what treatments delivered in what ways are most effective for people with what set of characteristics with the fewest iatrogenic complications and adverse events. Answers to this complex question will permit more clinical and cost-effective ways to treat people with chronic pain.¹

None of the treatments described are successful in completely 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 its accompanying symptoms. On the basis of the demonstrated effects of psychological treatment of diverse chronic pain disorders and the preliminary results reported for neuropathic pain, we recommend that psychological approaches be considered as complementary, not alternative, to medical treatment of neuropathic pain. The techniques and modalities described can be readily integrated into more comprehensive rehabilitation programs as useful complements to physical therapy, medication management, and rehabilitation. Patients can use psychological approaches and techniques as active personal interventions in their routine self-management and pain flare-ups. They convey a sense of hopefulness as an antidote to the more common feelings of helplessness and dependency. Thus, we recommend that psychological treatment, in particular CBT,

be considered as a part of a comprehensive treatment for patients with chronic neuropathic pain.

REFERENCES

1. Turk DC. Clinical effectiveness and cost-effectiveness of treatments for patients with chronic pain. *Clin J Pain*. 2002;18(5):355-365.
2. Noble M, Tregear SJ, Treadwell JR, Schoelles K. Long-term opioid therapy for chronic noncancer pain: a systematic review and meta-analysis of efficacy and safety. *J Pain Symptom Manage*. 2008;35(2):214-228.
3. Ives TJ, Chelminski PR, Hammett-Stabler CA, et al. Predictors of opioid misuse in patients with chronic pain: a prospective cohort study. *BMC Health Serv Res*. 2006 Apr 4;6:46.
4. Katz NP, Sherburne S, Beach M, et al. Behavioral monitoring and urine toxicology testing in patients receiving long-term opioid therapy. *Anesth Analg*. 2003;97(4):1097-1102.
5. Michna E, Ross EL, Hynes WL, et al. Predicting aberrant drug behavior in patients treated for chronic pain: importance of abuse history. *J Pain Symptom Manage*. 2004;28(3):250-258.
6. Taylor RS, Van Buyten JP, Buchser E. Spinal cord stimulation for chronic back and leg pain and failed back surgery syndrome: a systematic review and analysis of prognostic factors. *Spine*. 2005;30(1):152-160.
7. Franklin GM, Haug J, Heyer NJ, McKeefrey SP, Picciano JF. Outcome of lumbar fusion in Washington state workers' compensation. *Spine*. 1994;19(17):1897-1904.
8. Ernst E. Adverse effects of spinal manipulation: a systematic review. *J R Soc Med*. 2007;100(7):330-338.
9. Flor H, Fydrich T, Turk DC. Efficacy of multidisciplinary pain treatment centers: a meta-analytic review. *Pain*. 1992;49(2):221-230.
10. Atkinson JH, Slater MA, Patterson TL, Grant I, Garfin SR. Prevalence, onset, and risk of psychiatric disorders in men with chronic low back pain: a controlled study. *Pain*. 1991;45(2):111-121.
11. Kroenke K, Price RK. Symptoms in the community: prevalence, classification, and psychiatric comorbidity. *Arch Intern Med*. 1993;153(21):2474-2480.
12. von Korff M, Simon G. The relationship between pain and depression. *Br J Psychiatry Suppl*. 1996;(30):101-108.
13. Banks SM, Kerns KD. Explaining high rates of depression in chronic pain: a diathesis-stress framework. *Psychol Bull*. 1996;119(1):95-110.
14. Okifuji A, Turk DC, Sherman JJ. Evaluation of the relationship between depression and fibromyalgia syndrome: why aren't all patients depressed? *J Rheumatol*. 2000;27(2):212-219.
15. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)*. Washington, DC: American Psychiatric Association; 2000.
16. Gore M, Brandenburg NA, Dukes E, Hoffman DL, Tai K-S, Stacey B. Pain severity in diabetic peripheral neuropathy is associated with patient functioning, symptom levels of anxiety and depression, and sleep. *J Pain Symptom Manage*. 2005;30(4):374-385.
17. American Psychiatric Association. *User's Guide for the Structured Clinical Interview for DSM-IV Axis I Disorders SCID-I*. Clinician version. Washington, DC: American Psychiatric Press; 1997.
18. Turk DC, Melzack R, eds. *Handbook of Pain Assessment*. 2nd ed. New York, NY: Guilford, 2001.
19. Melzack R. The short-form McGill Pain Questionnaire. *Pain*. 1987;30(2):191-197.
20. Dworkin RH, Corbin AE, Young JP, et al. Pregabalin for the treatment of postherpetic neuralgia: a randomized, placebo-controlled trial. *Neurology*. 2003;60(9):1274-1283.
21. Rowbotham M, Harden N, Stacey B, Bernstein P, Magnus-Miller L; Gabapentin Postherpetic Neuralgia Study Group. Gabapentin for the treatment postherpetic neuralgia: a randomized controlled trial. *JAMA*. 1998;280(21):1837-1842.
22. Dworkin RH, Turk DC, Reivicki DA, et al. Development and initial validation of an expanded and revised version of the Short-form McGill Pain Questionnaire (SF-MPQ-2). *Pain*. 2009;144(1-2):35-42.
23. Beck AT, Steer RA, Ball R, Ranieri WF. Comparison of Beck Depression Inventories-IA and -II in psychiatric outpatients. *J Pers Assess*. 1996;67(3):588-597.

24. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry*. 1961;4(6):561-571.
25. McNair DM, Lorr M, Droppleman LF. *Profile of Mood States*. San Diego, CA: Educational and Industrial Testing Service; 1971.
26. Dworkin RH, Turk DC, Farrar JT, et al. Core outcome measures for chronic pain clinical trials: IMMPACT recommendations. *Pain*. 2005;113(1-2):9-19.
27. Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). *Med Care*. 1992;30(6):473-483.
28. Cleeland CS, Ryan KM. Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore*. 1994;23(2):129-138.
29. Kerns RD, Turk DC, Rudy TE. The West Haven-Yale Multidimensional Pain Inventory (WHYMPI). *Pain*. 1985;23(4):345-356.
30. Guyatt GH, Feeney DH, Patrick DL. Measuring health-related quality of life. *Ann Intern Med*. 1993;118(5):622-629.
31. Fordyce WE. *Behavioral Methods for Chronic Pain and Illness*. St Louis, MO: Mosby; 1976.
32. Turk DC, Meichenbaum D, Genest M. *Pain and Behavioral Medicine: A Cognitive-Behavioral Perspective*. New York, NY: Guilford; 1983.
33. Turk DC. Cognitive-behavioral approach to the treatment of chronic pain patients. *Reg Anesth Pain Med*. 2003;28(6):573-579.
34. Fordyce WE, Fowler RS Jr, Lehmann JF, deLateur BJ. Some implications of learning in problems of chronic pain. *J Chronic Dis*. 1968;21(2):179-190.
35. Hoffman BM, Papas RK, Chatkoff DK, et al. Meta-analysis of psychological interventions for chronic low back pain. *Health Psychol*. 2007;26(1):1-9.
36. Morley S, Eccleston C, Williams A. Systematic review and meta-analysis of randomized controlled trials of cognitive behaviour therapy and behaviour therapy for chronic pain in adults, excluding headache. *Pain*. 1999;80(1):1-13.
37. Evans S, Fishman B, Spielman L, et al. Randomized trial of cognitive behavior therapy versus supportive psychotherapy for HIV-related peripheral neuropathic pain. *Psychosomatics*. 2003;44(1):44-50.
38. Jensen MP, Barber J, Romano JM, et al. A comparison of self-hypnosis versus progressive muscle relaxation in patients with multiple sclerosis and chronic pain. *Int J Clin Exp Hypn*. 2009;57(2):198-221.
39. Jensen MP, Hanley MA, Engel JM, et al. Hypnotic analgesia for chronic pain in persons with disabilities: a case series. *Int J Clin Exp Hypn*. 2005;53(2):198-228.
40. van Tulder MW, Ostelo RWJG, Vlaeyen JWS, Linton SJ, Morley SJ, Assendelft WJJ. Behavioral treatment for chronic low back pain (Cochrane Review). In: Cochrane Library, issue 3, 2002. Oxford: Update Software.
41. Turner JA, Holtzman S, Mancini L. Mediators, moderators, and predictors of therapeutic change in cognitive-behavioral therapy for chronic pain. *Pain*. 2007;127(3):276-286.
42. Turk DC. The potential of matching treatments to characteristics of chronic pain patients: lumping vs. splitting. *Clin J Pain*. 2005;21(1):44-55.
43. Vlaeyen JW, Morley S. Cognitive-behavioral treatments for chronic pain: what works for whom? *Clin J Pain*. 2005;21(1):1-8.
44. Bergstrom G, Jensen IB, Bodin L, et al. The impact of psychologically different patient groups on outcome after a vocational rehabilitation program for long-term spinal pain patients. *Pain*. 2001;93(3):229-237.
45. Dalton JA, Keefe FJ, Carlson J, et al. Tailoring cognitive-behavioral treatment for cancer pain. *Pain Manag Nurs*. 2004;5(1):3-18.
46. Thieme K, Turk DC, Flor H. Responder criteria for operant and cognitive-behavioral treatment of fibromyalgia syndrome. *Arthritis Rheum*. 2007;57(5):830-836.
47. Turk DC, Okifuji A, Sinclair JD, Starz TW. Differential responses by psychosocial subgroups of fibromyalgia syndrome patients to an interdisciplinary treatment. *Arthritis Care Res*. 1998;11(6):397-404.