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Cognitive–Behavioral Therapy for Hand and Arm Pain

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Abstract

Cognitive–behavioral therapy (CBT) is a psychological treatment that emphasizes the interrelation among thoughts, behaviors, feelings, and sensations. CBT has been proved effective not only for treatment of psychological illness but also for teaching adaptive coping strategies in the context of chronic illnesses, including chronic pain. The present article provides general information on CBT, specific information on CBT for pain, as well as guidelines and strategies for using CBT for hand and arm pain patients, as part of multidisciplinary care models.

Cognitive–behavioral therapy (CBT) is a short-term psychological treatment that focuses on how individuals think, feel, and behave. CBT emphasizes the role of thoughts (cognition) in causing and/or maintaining psychological distress and aims to decrease distress by replacing inappropriate or maladaptive negative thoughts with more accurate and adaptive thoughts. CBT also focuses on changing maladaptive behaviors (e.g., avoidance) and increasing pleasurable activities. Through CBT, individuals gain a thorough understanding of the relationship between their thoughts, feelings, and behaviors, and learn skills to change unhelpful negative cognitions and behaviors to improve quality of life.¹

Cognitive–behavioral therapy is based on a scientific understanding of human cognition and behavior established by decades of research. CBT brings together *Cognitive therapy*^{2,3} (which emphasizes the pivotal role of thoughts/cognitions) and *Behavioral therapy*⁴ (which stresses the primordial role of behaviors and behavioral contingencies).

THE HUMAN MIND

Our interpretation of day-to-day events, including physical symptoms, is influenced by life experiences, societal factors, and, to some extent, biology. A particular situation or event triggers *automatic thoughts* that differ from individual to individual. The term *automatic* implies that these thoughts are not voluntarily chosen by individuals but rather pop up in one's mind. Individuals are often unaware of their automatic thoughts; yet, the thoughts influence their feelings and actions/behaviors.

For example, two people stuck in traffic on their way to an important meeting may interpret a situation in different ways and may have different behavioral and emotional reactions to it.

Person A may experience worry; anger; frustration, or may engage in violent behaviors, such as honking the horn and yelling at other drivers or passengers. Individual A's behaviors and feelings are a result of negative, non-adaptive automatic thoughts, such as "This is ridiculous, everyone here is a horrible driver"; "This is just my luck; only bad things can happen to me; I just can't believe this"; "I am going to be late and I will be fired." Person B remains calm and engages in behaviors, such as turning on the radio to his favorite program. Individual B's behavior and feelings are a result of positive, adaptive automatic thoughts, such as "There is nothing I can do right now, but call and say I will be late"; "Getting upset over this situation will not solve anything"; "This is no one's fault"; "I need to make the best of this situation."

Interpretations that are negative lead to negative emotions and behaviors, whereas interpretations that are adaptive/positive lead to positive emotions and behaviors. In addition, maladaptive behaviors can increase negative thoughts and feelings. Thoughts and behaviors are interrelated. This interrelation is particularly important, as what we think and do are mutually reinforcing. Over time, negative thoughts, behaviors, and feelings become more and more negative, making escape from this vicious cycle difficult.

HUMAN BEHAVIOR

Behavioral approaches focus on the way in which thoughts or behaviors may accidentally get "rewarded" within one's environment, contributing to an increase in the frequency of these thoughts and behaviors.⁵ Behavioral therapy also stresses the role of avoidance behaviors and reinforcers (positive and negative) in maintaining unhelpful behaviors, feelings, and thoughts.⁵ For example, imagine a person who is afraid to ride in an elevator. To avoid the fear and anxiety, this person might eventually choose to avoid all elevators and walk up flights of stairs instead. Walking up instead of taking the elevator prevents the person from experiencing fear and anxiety, and thus, acts as a negative reinforcer (by taking away fear and anxiety) and positive reinforcer (by giving a calm feeling). On the contrary, the extra time and energy that is needed to walk the stairs could feel unpleasant and also might cause the person to be late for work or events with friends. These negative feelings might reinforce the belief that elevators are dangerous.

Behavior therapists suggest that avoiding the elevator has been rewarded with the absence of anxiety and fear. Behavioral treatments would involve supervised and guided experience with riding elevators until the "rewards" associated with avoidance of elevators have been "un-learned," and the negative associations with riding in elevators has been "unlearned." Patients are, thus, encouraged to sit with their fear and anxiety rather than give in to them.⁶ Although behavioral therapies are different from disorder to disorder, a common thread is that behavioral therapists encourage patients to try new behaviors and not to allow negative "rewards" to dictate their actions.

COGNITIVE-BEHAVIORAL THERAPY

Cognitive-behavioral therapy integrates principles of cognitive and behavioral therapy. CBT 1) helps us appreciate and become mindful of the interrelation of thoughts, feelings, and

behaviors; and 2) teaches us how to become aware of our automatic thoughts and to be prepared to appreciate when they are nonadaptive or inaccurate. CBT is instruction and training in the behaviors (approach rather than avoid activities); thoughts (e.g., change negative thinking to adaptive); and feelings (work with rather than escape uncomfortable feelings and sensations) that optimize health and well-being.⁷

Cognitive-behavioral therapy is one of the most efficacious psychological treatments; approximately 80% of the treatments for specific disorders (for both adults and children), characterized as having research support, fall within the CBT class.⁸ Within the field of pain, CBT has proved efficacious either alone or in combination with medical treatments. A review of 205 studies⁹—most of them randomized controlled trials—showed that psychological interventions, such as CBT, relaxation, and biofeedback, were, on average, more effective than standard biomedical treatments, including surgery for decreasing pain intensity, pain-related disability, health-related quality of life, and depression in patients with low-back pain. Research also indicates that CBT, as part of a multidisciplinary treatment approach, is efficacious for migraines and daily headaches,¹⁰ musculoskeletal pain,¹¹ pain in the elderly,¹² cancer pain,¹³ arthritis pain,¹⁴ fibromyalgia,¹⁵ chronic low-back pain,¹⁶ wrist pain,¹⁷ chronic pelvic pain,¹⁸ and nonspecific pain.¹⁹

THE COGNITIVE-BEHAVIORAL MODEL FOR PAIN

Our interpretations (automatic thoughts) and behaviors when faced with a pain sensation usually manifest in the difference between disease, nociception, and impairment on one hand, and illness, pain, and disability on the other hand. Disease is defined as an “objective biological event” that involves disruption of specific body structures or organ systems, caused by pathological, anatomical, or physiological changes.²⁰ The medical dictionary defines impairment as an “objective loss of function” proportionate to the magnitude of the biological event and nociception as the perception of a painful stimulus, which entails stimulation of nerves that convey information about tissue damage to the brain.

In contrast, illness is defined as a “subjective experience or self-attribution” that a disease is present;²¹ the physical discomfort, emotional distress, behavioral limitations, and psychosocial disruption of the illness do not directly correlate with disease and impairment. Illness is, thus, how the sick person and the social network—and perhaps the society—perceive, live with, and respond to physical symptoms. Disability is the effect of this subjective experience. For example, two people with the same disease or impairment can have different levels of disability based on how they perceive their illness, what they perceive they can or cannot do, and what they actually do or avoid doing.

Pain is the subjective perception that results from the modulation of the sensory input filtered through a person’s genetic makeup, prior learning and current physiological status, appraisals, expectations, mood, and sociocultural factors. Illness, pain, and disability are inseparable as are the cognitive and behavioral aspects of illness. They occur on a continuum between adaptation, resiliency, and maintained function in spite of substantial impairment on the one hand and disproportionate complaints and disability with little or no objective impairment on the other. Beyond the underlying pathophysiology or disease, the illness

encompasses the complex human reaction to injury and illness. Illness, disability, and pain are always interactive, mind–body events.

Our automatic thoughts in response to nociception—which reflect our beliefs about the *meaning of pain and own ability to function despite discomfort*—determine the level of disability that we experience. For example, pain associated with the intentional stretch of a muscle before athletics or the pain experienced the day after a good workout is desired and does not trigger anxiety and withdrawal or avoidance (e.g., the “pain alarm”), whereas the pain triggered by burning one’s hand on the stove has a different interpretation and consequence.

Interpretations of pain vary widely among individuals and within a particular individual over time. For example, among people with similar degrees of arthrosis, pain may be interpreted either as a normal part of aging or as a sign of damage, with most of our reactions falling somewhere in between these two extremes. A belief that one has a serious, debilitating condition; that disability is a necessary aspect of pain; that activity is dangerous; and that pain is an acceptable excuse for neglecting responsibilities, will likely result in decreased health and well-being (more pain, greater disability). Similarly, if patients believe that they have a serious condition or that they are at risk of injury or reinjury, then they may fear engaging in physical activity and become increasingly disabled and deconditioned over time.

In addition to a patient’s intuition and expectations about pain, their coping mechanisms, social support, insurance and legal issues, the culture and health care system, and their employer are all important determinants of how much pain and disability a given nociception produces.²¹ These factors also affect how patients present their symptoms to family, employer, and health care providers.

Overt communication of pain, suffering, and distress may create responses that can reinforce both maladaptive pain behaviors and misconceptions regarding seriousness, severity, and inability to control the pain. For instance, health providers may prescribe more potent medications, order additional tests, or offer specific treatments (even surgery) even when these are—according to the best available evidence—not in the patient’s best interest. Family members may respond either with sympathy, which reinforces passivity (“there’s nothing I can do about my situation”, “it’s beyond my control”) or punishment, which reinforces a sense of failure. Pain often creates negative beliefs about an individual’s ability to meaningfully engage in life (e.g., low self-efficacy). Pain can also lead to avoidance of activities thought to exacerbate the pain or contribute to injury, thereby missing out on the opportunity for a corrective experience.

CBT IN THE CONTEXT OF HAND AND ARM PAIN

Cognitive–behavioral therapy is useful in conjunction with evidence-based, disease-modifying treatments for discrete diseases or in conjunction with palliative treatments for nonspecific conditions or diseases that cannot be modified. Other fields of medicine have found that these issues may be best addressed by collaborative teams consisting of a spectrum of health providers, such as surgeons; nonoperative providers, such as physiatrists,

certified hand therapists, and behavioral medicine specialists/psychologists. Treatment teams have been successful in the treatment of several pain conditions.²²

The most common psychosocial correlates of increased pain intensity and disability (depression, pain catastrophizing and negative pain thoughts, and heightened illness concerns)²³ are very responsive to CBT. Previously well-compensated psychosocial factors may become problematic when one is confronted with pain. For instance, a patient who tends to worry about minor matters may develop *pain catastrophizing* (a tendency to magnify the pain experience, to feel helpless when thinking about pain, and to ruminate on the pain experience). Someone who has a tendency to worry about his health may start viewing a benign pain condition as a sign of serious pathology and may have a difficult time internalizing reassurance that his condition is benign (*heightened illness concern, health anxiety, or hypochondriasis*). A depressed patient may make internal (“It’s my fault”), global (“Everything is going wrong”), and stable (“I will never get over this”) attributions about the pain conditions. Pain may exacerbate a predisposition toward *depression*, may intensify an already existent depression, or may become a somatic focus for depressive symptoms.²⁴ A tendency toward negative thinking and appraisal of life situations may translate into a similar appraisal of the pain condition. All of this may convert into reports of increased pain and disability.

Cognitive-behavioral therapy is also useful in addressing more subtle psychosocial factors associated with pain, such as pain as 1) a reminder of aging and mortality; 2) false media-reinforced beliefs in a quick fix for every pain condition; 3) false media-reinforced beliefs in the right to have a pain-free existence; 4) media- and society-reinforced misconceptions about pain; and 5) medical treatments (e.g., pain is always a signal to stop moving).

Cognitive-behavioral treatment is individualized to each patient’s particular issues, which generally fit into one of the following categories: 1) patients with a pain condition not amenable to medical interventions (e.g., nonspecific or idiopathic pain); 2) patients with a discrete pain condition for which medical treatment is available, but who are presenting with symptoms and disability over and above what is typically expected for the particular condition; 3) patients with premorbid psychological disorders (e.g., depression, anxiety), whose psychological symptoms have worsened due to pain; 4) patients with a traumatic pain condition who developed symptoms of acute stress disorder, posttraumatic stress disorder (PTSD), or anxiety; 5) patients who have a pain condition that requires surgery and who have premorbid depression or premorbid overinterpretation of pain (e.g., catastrophizing); 6) patients with chronic pain conditions.

CBT STRATEGIES FOR PAIN

Cognitive-behavioral therapy follows modules that address behavioral and cognitive components (Table 1). There are many variations in CBT, with the number and modules varying based on the patient’s individual problems, which are identified during the initial evaluation and discussion with the treatment team. Several CBT strategies for chronic pain treatment manuals are currently available^{25,26} and provide clear guidelines for adaptive pain-coping skills training.

Education and socialization to treatment is an important module in CBT in general and CBT for pain in particular. Within this module, the focus is on delivering general information on the mind–body connection and pain, as well as building the therapeutic alliance, normalizing the situation and the patient’s coping difficulties, and ensuring that the patient is comfortable with the overall approach of therapy in an orthopedics department. During this module, which typically includes one session, the patient gets information about the CBT model for pain; the interrelation among thoughts, behaviors, and feelings/sensations; and the skills necessary to better cope with pain.

When patients are either not motivated for treatment or are overly focused on a medical treatment that is not available or would not be beneficial, a pros-and-cons exercise is conducted, where patients are asked to elicit the advantages and disadvantages of continuing seeking a heretofore elusive medical treatment versus trying something new like CBT. In addition, during this session, realistic goals for CBT are established.

One of the most valuable modules is *cognitive restructuring*. This module focuses on the cognitive aspect of the CBT model. Patients learn about the nature of *automatic thoughts*, including slowing down time and identifying them. In-session exercises are conducted. For example, a patient may be asked to engage in an activity that causes pain and immediately generate thoughts about the experience. Next, patients learn that the automatic thoughts follow a general pattern and fit into categories of *cognitive errors/distortions*. Patients learn the nature of the most common cognitive distortions and identify which of those they are typically making. Some of the cognitive errors include: 1) *overgeneralization*: taking one situation and specific event and generalizing it to a large range of events and situations (e.g., “This coping strategy is not working for me so nothing will”); 2) *catastrophizing*: focusing exclusively on the worst possibility regardless of its likelihood of occurrence (e.g., “The pain in my arm means that my entire body is degenerating and falling apart”); 3) *all or nothing thinking*: considering only the worst or best interpretation, without seeing the range of alternatives (e.g., “My life was perfect before the onset of pain, now it is horrible”); 4) *selective attention*: selectively attending to negative aspects of the situation while ignoring the positive things (e.g., “Moving my arm serves only to make me feel worse than I already do”); 5) *jumping to conclusions*: accepting an arbitrary interpretation without a rational evaluation of the situation (e.g., “The doctor referred me to CBT because he thinks I am hopeless”).

Within the last step of the cognitive restructuring module, patients learn to reframe the negative thoughts into more adaptive and positive thoughts, by means of a process called *cognitive reframing*.²⁷ During this process, patients learn to ask themselves questions that challenge the negative thoughts, such as: “What is the evidence that this thought is true?”; “What is the real probability that this will actually happen?”; “What would I tell a friend in this particular situation?”; “Where does this type of thinking get you?”

The cognitive module includes a minimum of two sessions and may necessitate up to four to five sessions for cases where depression and anxiety are comorbid or when patients have had pain for several years and their cognitive patterns have been ingrained and reinforced over the years. An important component of this module is self-monitoring, where patients

complete a thought record, where they record the thoughts triggered by a particular situation, the mood associated with the thoughts, the cognitive error the thoughts fit into, questions used to reframe the negative automatic thoughts, the alternative thought, and the mood related to the new thought. Monitoring is important, because it allows the patient to practice at home the skills learned during the session. In addition, this monitoring allows a continuity of sessions. Over time, patients learn to engage in this process without having to keep a thorough record. The goal is, thus, for this process to become automatic and for patient to learn that they have control over how they appraise a situation and how they feel and behave.

Acceptance^{28,29} is an important module for patients with a chronic pain condition, patients with nonspecific pain conditions, and patients who have undergone a traumatic accident that resulted in some level of impairment. Through this module, patients are given time to grieve the loss, to process feelings, and to think about the injury or chronic pain conditions. For patients with symptoms or diagnoses of PTSD, a more thorough exposure with relapse prevention treatment (ERP⁶) is conducted outside of the typical pain protocol. Within the ERP methods, patients are gradually exposed to situations that have become associated with the traumatic event and are triggers for anxiety and discomfort. Through exposure, patients learn to sit with the initial anxiety, habituate to the anxiety, and reframe negative cognitions associated with the trauma.

Relaxation training is a particularly useful module for patients with comorbid anxiety, or those with heightened illness concerns, pain anxiety and impatience. Its aim is to decrease suffering associated with the pain sensation (e.g., anxiety, worry, anger, frustration) and increase beliefs that one can cope with pain. The module includes two main skills: 1) diaphragmatic breathing and 2) progressive muscle relaxation (PMR).³⁰ Patients learn that the body typically responds to pain by tightening of muscles and shallow fast breathing. This, in turns, leads to feelings of anxiety, fear, and discomfort. In diaphragmatic breathing, patients learn to engage in deep, slow breathing, thus, decreasing the anxiety, fear, and discomfort. Furthermore, in PMR, patients learn to tense and then relax various groups of muscles and, thus, notice the difference between being tense and being relaxed. Through practice, over time, patients learn to become aware of tightness in the body and elicit a relaxation response. Within this model, it is important to ensure that patients have a clear expectation that this exercise will not necessarily decrease their pain. Rather, it will eliminate the suffering (anxiety, fear, negative thoughts) associated with pain.

Relaxation is often used in conjunction with *desensitization*, an important module for patients who avoid activities that cause pain and fear of the pain sensation. These concepts are also addressed through cognitive restructuring, but a behavioral component has been found to be superior in reducing fear avoidance. Within desensitization, patients learn to engage in more and more activities in spite of pain. These activities are set on a hierarchy, from activities that are not too difficult for patients and do not cause much pain to those that the patient considers more difficult. Patients move up the hierarchy and gradually return to most or all activities previously avoided. The desensitization module in CBT is similar to the desensitization used by hand therapists to reduce hypersensitivity from sensory nerve regeneration, with the difference that, within CBT, the focus is on reengaging in activities currently avoided due to fear of pain and reinjury, as opposed to a sole focus on exposing the

hypersensitive area to slightly irritable but more and more tolerable stimuli as means of increasing pain tolerance.

Attention diversion is particularly important in patients with heightened illness concerns who are preoccupied with their bodily symptoms. Patients may see any new sensation as an indication of deterioration or a new problem resulting from increase in exercises, physical activity, and others. Sometimes, in chronic pain conditions, or when patients are out of work due to their pain, people are isolated and, hence, they have nothing but the pain to focus on. Preoccupation to one's body results in increased awareness and overestimation of sensory information.³¹ An example of a case of not focusing versus focusing on pain is that of a typical athlete who may not notice pain during a game but become aware of the injuries postgame. Taking one's mind off pain and attending to something else results in reduced perception of pain and reduced arousal. Distraction strategies include hobbies, music, TV, using imagination. *Behavioral activation*³² is very useful in patients with depression or in those who are out of work. Patients learn to engage in 1) mastery activities (e.g., focus on doing things that are challenging but are going to help them return to work or learn new skills and others); and 2) pleasurable activities (e.g., hobbies or things that used to give them pleasure but now they no longer enjoy). *Activity pacing*^{25,26} teaches patients to engage in activity in spite of pain by alternating activity with rest. This module teaches that it is fine to engage in activity in spite of pain and challenges maladaptive beliefs or incapacity and helplessness. Other strategies that can be used in CBT include problem-solving strategies; communication and assertiveness skills; the role of family, friends, and work in reinforcing pain and distress; and how they may help the patient adjust and move forward. In addition, a discussion of relapse prevention and future planning is important in all cases but particularly in patients with pain conditions that wax and wane.

CONCLUSION

Cognitive-behavioral therapy is an effective and efficacious treatment for pain conditions from chronic back pain to daily headaches. More recent research has shown that CBT is effective in treating hand and arm pain conditions, including discrete wrist pain and idiopathic hand and arm pain. However, large randomized controlled trials on the role of CBT for hand and arm pain are currently lacking and should be a pivotal direction for future research. Preliminary studies do show that CBT is a useful tool that can be used alone or in conjunction with treatments offered by hand therapists, surgeons, and physiatrists. By changing their thoughts and beliefs about nociception, patients can more actively participate in their own recovery, experience overall less disability, and improve their quality of life.

REFERENCES

1. British Association for Behavioural and Cognitive Psychotherapies. What are cognitive and/or behavioural psychotherapies? [Accessed Jan 11, 2010] Available at: http://en.wikipedia.org/wiki/British_Association_for_Behavioural_and_Cognitive_Psychotherapies.
2. Beck, A. Cognitive Therapy and the Emotional Disorders. New York, NY: Penguin; 1993.
3. Beck, JS. Beck Institute for Cognitive Therapy and Research. The Beck Institute Newsletter; 2001 Feb. Why distinguish between cognitive therapy and cognitive behaviour therapy. Available at: <http://www.beckinstitute.org/InfoID/150/RedirectPath/Add1/FolderID/177/SessionID/>

{0D09F15E-3892-4E06-BB1E-1B50944EA9E9}/InfoGroup/Main/InfoType/Article/PageVars/Library/InfoManage/Zoom.htm [Accessed Nov 21, 2008]

4. Yates, AJ. Behavior Therapy. New York, NY: Wiley; 1970.
5. Skinner, BF. Contingencies of Reinforcement: A Theoretical Analysis. New York, NY: Meredith Corporation; 1996.
6. de Silva P, Rachman S. Exposure and fear-reduction. Behav Res Ther. 1983; 21:151–152. [PubMed: 6838470]
7. Burns, D. The Feeling Good Handbook. New York, NY: Plume; 1999.
8. Chambless DL, Ollendick TH. Empirically supported psychological interventions: controversies and evidence. Annu Rev Psychol. 2001; 52:685–716. [PubMed: 11148322]
9. Hoffman BM, Papas RK, Chatkoff DK, Kerns RD. Meta-analysis of psychological interventions for chronic low back pain. Health Psychol. 2007; 26:1–9. [PubMed: 17209691]
10. Lake AE 3rd. Behavioral and nonpharmacologic treatments of headache. Med Clin North Am. 2001; 85:1055–1075. [PubMed: 11480258]
11. Linton SJ, Andersson T. Can chronic disability be prevented? A randomized trial of a cognitive-behavior intervention and two forms of information for patients with spinal pain. Spine. 2000; 25:2824–2831. [PubMed: 11064529]
12. Manetto C, McPherson SE. The behavioral-cognitive model of pain. Clin Geriatr Med. 1996; 12:461–471. [PubMed: 8853939]
13. Dalton JA, Keefe FJ, Carlson J, Youngblood R. Tailoring cognitive-behavioral treatment for cancer pain. Pain Manage Nurs. 2004; 5:3–18.
14. Keefe FJ, Caldwell DS. Cognitive behavioral control of arthritis pain. Med Clin North Am. 1997; 81:277–290. [PubMed: 9012765]
15. Williams DA. Psychological and behavioural therapies in fibromyalgia and related syndromes. Best Pract Res Clin Rheumatol. 2003; 17:649–665. [PubMed: 12849717]
16. van Tulder MW, Koes B, Malmivaara A. Outcome of noninvasive treatment modalities on back pain: an evidence-based review. Eur Spine J. 2006; 15(Suppl 1):S64–S81. [PubMed: 16320031]
17. Feuerstein M, Burrell LM, Miller VI, Lincoln A, Huang GD, Berger R. Clinical management of carpal tunnel syndrome: a 12-year review of outcomes. Am J Ind Med. 1999; 35:232–245. [PubMed: 9987556]
18. Reiter RC. Evidence-based management of chronic pelvic pain. Clin Obstet Gynecol. 1998; 41:422–435. [PubMed: 9646974]
19. Vranceanu AM, Ring D, Cowan J, Safren S. Idiopathic arm pain. Delivering cognitive behavioral therapy as part of a multidisciplinary team in a surgical practice. Cogn Behav Pract. 2008; 15:244–254.
20. Mechanic, D. Illness behavior: an overview. In: McHugh, S.; Vallis, TM., editors. Illness Behavior. A Multidisciplinary Model. New York, NY: Plenum Press; 1986. p. 101-110.
21. Turk, DC.; Monarch, ES. Biopsychosocial perspective on chronic pain. In: Turk, DC.; Gatchel, RJ., editors. Psychological Approaches to Pain Management. New York, NY: Guilford Press; 1999.
22. Jensen MP, Turner JA, Romano JM, Karoly P. Relationship of pain specific beliefs to chronic pain adjusting. Pain. 1994; 57:301–309. [PubMed: 7936708]
23. Pincus T, Vogel S, Burton AK, Santos R, Field AP. Fear-avoidance and prognosis in back pain: a systematic review and synthesis of current evidence. Arthritis Rheum. 2006; 54:3990–4010.
24. Dersh M, Mayer TG, Gatchel RJ, Towns B, Theodore B, Polatin PB. Do psychological disorders first appear pre- or post-injury in chronic disabling occupational spinal disorders? Spine. 2007; 32:1045–1051. [PubMed: 17450081]
25. Turk, DC.; Winter, F. How to Reclaim Your Life. Washington, DC: APA; 2005. The Pain Survival Guide.
26. Caudill, M. Managing Pain Before It Manages You. Washington, DC: APA; 2002.
27. Beck, JS. Cognitive Therapy: Basics and Beyond. New York, NY: Guilford Press; 1995.
28. Hayes, SC.; Smith, S. Get Out of Your Mind and Into Your Life: The New Acceptance and Commitment Therapy. Oakland, CA: New Harbinger; 2005.

29. McCracken LM, Vowles KE. Acceptance of chronic pain: component analysis and a revised assessment method. *Pain*. 2004; 107:159–166. [PubMed: 14715402]
30. Jacobson, E. *Progressive Relaxation*. Chicago, IL: University of Chicago Press; 1938.
31. Barsky AJ, Borus JF. Somatization and medicalization in the era of managed care. *JAMA*. 1995; 274:1931–1934. [PubMed: 8568987]
32. Kanter JW, Callaghan GM, Landes SJ, Busch AM, Brown KR. Behavior analytic conceptualization and treatment of depression: traditional models and recent advances. *Behavior Analyst Today*. 2004; 5:255–274.

TABLE 1

Descriptions of the Primary Modules for CBT for Hand and Arm Pain

Module	Focus	Skill
Education and socialization	Mind–body relationship Therapeutic alliance CBT model	Learn interrelation thoughts, behaviors, feelings/sensations
Cognitive restructuring	Cognitive	Identify automatic thoughts Identify cognitive errors Restructure cognitive errors
Acceptance	Emotional	Grieve the pain experience Change focus from being pain free to increasing functionality
Desensitization	Behavioral	Engage in activities previously avoided
Attention diversion	Cognitive/behavioral	Engage in a parallel activity while experiencing pain
Relaxation training	Emotional/sensations	Diaphragmatic breathing Progressive muscle relaxation
Activity pacing	Behavioral	Alternate activity and rest as means of increasing overall activity
Behavioral activation	Behavioral	Increase mastery and pleasure activities