

# Assessment and Treatment of Chronic Pain

A physician's guide to a biopsychosocial approach.



By John Mark Disorbio, EdD,  
Daniel Bruns, PsyD,  
and Giancarlo Barolat, MD

Pain is arguably the most common condition seen in primary care, and the most costly one as well. Although estimates vary, the National Center for Health Statistics concludes that fully 80% of all physician visits involve some complaint of pain.<sup>1</sup> Another study found that 38% of patients presenting in primary care were reporting chronic pain, but the prevalence of acute pain was not assessed.<sup>2</sup>

A research study at a large HMO studied the costs of chronic pain and other common chronic conditions. Using the data from this study, the estimated cost of each chronic condition was calculated by multiplying the average cost per patient for each condition by the prevalence of the condition. A chronic pain category was formed by combining patients with complaints of back pain, neck pain, headaches or facial pain. Using this approach, the cost of treating chronic pain exceeded the costs of all other chronic conditions that were assessed, including heart disease, respiratory disease, or cancer (see Table 1). The costs of chronic pain to society is also large, as chronic pain has

been identified in some studies as the leading cause of disability in working age individuals.<sup>4</sup> However, unlike most medical diagnoses which can be diagnosed by objective medical findings, pain is a subjective experience.<sup>5</sup>

Despite the high costs noted in Table 1, pain can usually be treated easily and inexpensively. The problem is that the small percentage of patients who go on to develop chronic pain are extraordinarily expensive to treat. One study found that 10% of back pain cases with chronic pain accounted for around 79% of the costs,<sup>6</sup> which would make this group of chronic patients 34 times more expensive to treat than the other patients. Similarly, another study found that 5% of chronic back pain cases accounted for about 85% of all medical costs for this condition,<sup>7</sup> making this group of chronic patients 57 times more expensive to treat. One of the reasons that chronic pain is so expensive is that it is a classic example of a biopsychosocial disorder.<sup>8,9</sup> Due to the complex nature of chronic pain, medical treatment alone may not be effective, and multidisciplinary treatment may be needed.<sup>10</sup> The

purpose of this article is to focus on the psychological and social dimensions of chronic pain and to offer suggestions as to how these two dimensions can be combined with the medical dimension to improve care.

Most Expensive Treatment Costs In Primary Care		
Rank	Diagnosis	Cost in \$ millions
1	Pain	\$198.0
2	Heart disease	\$170.1
3	Hypertension	\$112.3
4	Respiratory disease	\$90.2
5	Diabetes	\$85.6
6	GI disease	\$67.5
7	Arthritis	\$64.4
8	Cancer	\$55.0
9	Depression	\$44.8
10	Pregnancy	\$42.2

**TABLE 1.** Most Expensive Treatment Costs In Primary Care. Adapted from Fishman, et al 1997<sup>9</sup>

## Phases of Pain Treatment

The treatment of pain generally proceeds through several distinct phases. Following the onset of a painful condition, the treatment of acute painful conditions is driven by medical factors. Although the entry point for evaluation and treatment of pain conditions may be the emergency room or urgent care physician, it is typically the primary care physician (PCP) who manages the acute phase of treatment. The PCP generally begins with conservative care and, in most cases, patients recover as expected.

In the initial phase of treatment, normal medical treatment protocols are indicated. Routine diagnostics, medications, restriction of activity, and physical therapy are often used. During this phase, psychological and social factors generally play a much more limited role. However, there are some exceptions to this. If a patient with a mild injury appears severely depressed or unreasonably angry in the days following an accident, demands a high level of opioids, refuses examination, or is grossly noncompliant, the role of psychosocial complications should be explored. Behaviors such as these are uncommon in patients with acute conditions. When they do occur, they should not be overlooked as they may indicate that a biopsychosocial condition is already starting to evolve.

The subacute phase of pain, from one to six months post-injury, is the period during which transition from acute to chronic pain is most often observed. It has been theorized previously that biopsychosocial pain disorders occur in different forms with a distinct natural history. This natural history often involves a “downward spiral,” in which a medical condition becomes progressively more enmeshed with psychosocial complications.<sup>9</sup> Using this model, one of the first signs that a biopsychosocial pain disorder is developing in the subacute phase may be an observed deviation from the expected course of recovery. If, after a month or so, the severity of the reported pain or disability is difficult to explain given the objective medical findings, this increases the risk that the acute condition may be evolving into a chronic biopsychosocial pain disorder. Beyond the severity of the pain, it has also been observed that a prodromal sign of chronic pain is when the pain unexpectedly begins to spread to other body areas, even when there is no pathophysiological explanation for this.<sup>11</sup>

In the chronic pain phase, the full biopsychosocial spectrum is often seen. As noted elsewhere however, biopsychosocial disorders occur in different forms.<sup>9</sup> For example, in some cases, there is a clear pathophysiological explanation for the patient’s pain. The patient may have sustained a catastrophic injury, or there may be an identifiable disease process. A patient who has a life changing, painful medical condition will often need to contend with the social impact of being disabled. Given this kind of medical condition, some have commented that it is surprising when depression does not occur.<sup>12</sup> This associated distress can lead to additional stress-related symptoms, and to a worsening of the patient’s pain and suffering.

If the patient has any psychologically dysfunctional tendencies, this could also contribute to the downward spiral into chronic pain.<sup>9</sup> Psychological maladjustment may impact compliance and interfere with outcome. Additionally, other psychological risk factors—such as being somatically preoccupied, intolerant of pain, having an unjustified self-perception of disability, or being focused on compensation—can also increase the risk that a biopsychosocial pain disorder will appear.

Lastly, social conflicts revolving around the pain may appear.<sup>9</sup> This might take the form of conflicts in the workplace over preferential light duty, or arguments in the home around the patient’s inability to perform the customary chores. Tension may develop in the medical setting that revolves around compliance with treatment. This is much more likely to occur if the patient has unrealistic expectations, or is prone to conflicts with authority figures.

Patients with chronic pain may be treated in a variety of settings. These patients may continue in treatment with the PCP, or they may have their care taken over by a physician specializing in pain. These patients may also be seeing multiple non-physician professionals, and they may be treated in a multidisciplinary setting. Whatever the setting, it will be important to make some provision to assess the wide range of possible complications noted above.

## Assessing the Three Dimensions of Chronic Pain

Biopsychosocial pain disorders are by definition, disorders having three dimensions: biological, psychological, and social. Evaluating a chronic pain condition from a one-dimensional biological perspective is limiting, and often fails to fully explain the patient’s symptoms. Consequently, assessment requires not only the examination of the biological dimension, but of the psychological and social dimensions as well.

For example, suppose a patient with back pain is found to have a lumbar disc protrusion at L5-S1, which may be impinging on a nerve. The treatment plan must take this into consideration, but this may not fully explain the pain disorder. Further suppose that this patient has had great difficulty adjusting to the pain and disability, and is now experiencing a major depressive episode with suicidal ideation. This psychological information adds a new dimension to the condition, and alters the clinical picture significantly. Depression with suicidal urges is a potentially life-threatening condition, while the lumbar injury is not. Even if this patient was not suicidal, though, patients who are depressed tolerate pain less well,<sup>13-15</sup> may have less energy available to invest in exercise or other important aspects of treatment, and are more likely to forget to take their medications.<sup>16</sup> Thus failure to look beyond the one-dimensional medical perspective greatly increases the risk of a poor outcome.

Lastly, on the third, social dimension, suppose this is a worker’s compensation patient who hates his job, and is litigating to obtain disability compensation. If the patient works hard in PT after the surgery, faithfully performing painful exercises and he recovers fully, he will be returned to work at a job he hates—without any monetary compensation. On the other hand, if he does not invest himself in his recovery, and does not improve, he may be offered both a financial settlement and a lighter duty position at work. This incentivizes him to do poorly in treatment. Because of circumstances such as this, job dissatisfaction has been found to be an important predictor of outcome.<sup>17</sup>

Each of these three dimensions supplies a unique and critically important piece of information. If any of these dimensions are ignored, it will seriously impact the prognosis for recovery. In contrast, by assessing a patient from a three-dimensional biopsychosocial perspective, one can achieve a deeper understanding of the patient’s condition and uncover critically important information for developing a treatment plan.

Three-dimensional assessment is often challenging in the general medical setting, where the PCP is required to divide the

short period of time available for patient contact time between taking a history, examining the patient, making recommendations, and answering patient questions. With a mean patient contact time of less than 11 minutes for primary care physicians, psychosocial assessment is often challenging in this nonpsychiatric medical setting.<sup>18</sup> As a result, studies have found primary care physicians frequently overlook depression, anxiety, and other mental health conditions between 33% and 79% of the time.<sup>19</sup> One common solution to this problem is the use of psychometric assessment devices. These questionnaires are objective, time-saving devices that can be used by psychologists or physicians to assess biopsychosocial aspects of pain disorders.

In the case of chronic pain, an accurate three-dimensional diagnosis is necessary to develop an effective treatment plan. The earlier that psychosocial complications can be identified, the more likely appropriate interventions can be instituted and prevent the downward spiral into an intractable condition.

### Biopsychosocial Interventions

When treating biopsychosocial disorders, the interventions required must also have biological, psychological, and social dimensions. Each of these dimensions of treatment can be further subdivided into more specific treatment modalities.

The medical management of chronic pain revolves around three main components, namely, the physical, chemical, and electrical aspects of treatment. The physical component involves all the therapeutic modalities that can directly affect the musculoskeletal system. These involve physical therapy, chiropractic manipulations, massage, traction, and exercise, to name a few. They are directed to rectify some of the imbalances produced in the body by the pain condition. These modalities are extremely important, particularly early in the management of the pain condition, since they might actually correct the cause of the pain. In the chronic stages, they are most useful to prevent complications of disuse or atrophy.

The chemical component of treatment tries to reduce the pain by affecting some of the imbalances in the chemical systems caused by the pain conditions. Chemical approaches include oral administration of medications (narcotics, membrane stabilizers, anti-inflammatory, antidepres-

sants, etc), topical administration of analgesic medication to provide sustained tissue delivery (dermal patches), as well as intraspinal administration. Intraspinal administration includes epidurally infused medications through an externalized catheter, or intrathecally infused medications through an implanted drug delivery system. The latter are usually known as the “intrathecal pumps.” The multitude of drugs available, as well as the multitude of administration routes, points to the fact that none of these are optimal solutions. Intraspinal administration of analgesics drugs should be considered only as an extreme measure, and one that carries substantial potential complications and side effects. Only providers who have a team approach and who have a great deal of expertise with these modalities should perform it.

The electrical component of treatment acts on the principle that all pain signals are electrically conducted to the central

and a battery, both sealed into the unit. The pulse generator is usually implanted in a pocket under the skin and then connected via subcutaneous wires to the electrode(s). Neurostimulation can be extremely effective for neuropathic pain and it is probably the most specific treatment for permanent for permanent nerve injury pain. Unlike other destructive surgical procedures, both chemical and electrical invasive procedures can be tested first through a reversible trial period.

Psychosocial interventions for chronic pain revolve around four main components, treating affective distress, cognitive and characterological factors, chemical dependency concerns, and managing the social consequences of chronic pain. Within the realm of affective distress, depression and anxiety can be treated with both psychotherapy and with medication. More generalized distress may take the form of muscular bracing, autonomic arousal, or insomnia. For this, psycholog-

*“When treating biopsychosocial disorders, the interventions required must also have biological, psychological, and social dimensions.”*

nervous system and that chronic pain could be viewed as an abnormal signal conduction through the nervous system. By applying an extraneous stimulation to the nervous system, one might be able to “scramble” the pain signals, so that the central processing unit stops recognizing them as “painful.” The field of neurostimulation is very old. The ancient Romans used to treat gout attacks by having torpedo fish deliver electrical charges to the painful area. The simplest form of neurostimulation is transcutaneous electrical nerve stimulation (TENS). This can be very effective for localized areas of pain, particularly in the trunk area. The disadvantage is the need to wear the external unit, since the pain relief ceases immediately when the stimulation is discontinued.

Implantable neurostimulators have become more popular in the last decade. Electrodes can be surgically implanted on the peripheral nerves, on the spinal cord or in the brain. Stimulation is provided by a surgically implanted pulse generator, which is composed of a computer chip

ical treatments such as sleep hygiene training, relaxation training, biofeedback, or meditation are often useful. Additionally, exercise and caffeine reduction may also be of help.

Patients with chronic pain are often prescribed opioid pain medications. While these are often effective treatments, there is also potential for abuse. Patients with a history of substance abuse should be prescribed these medications with caution. If the patient is already actively abusing another substance, such as alcohol or cocaine, this is generally a contraindication for treatment with opioids. When concerns over substance abuse arise, psychological interventions will be required, as will an opioid treatment contract.

The patient’s cognitive processes and personality may greatly impact upon both the perception of pain, and how the patient adjusts to it. For example, the perception of chronic pain can be worsened by cognitive processes such as pain preoccupation, or by catastrophizing.<sup>20,21</sup> For this type of difficulty, cognitive psychotherapy is often effective.<sup>22</sup> In contrast,

the more deeply engrained, maladaptive tendencies seen in personality disorders may greatly interfere with how the patient copes with the pain condition. However, these disorders are often so deeply engrained that they are resistant to change. Consequently, focusing on trying to manage any dysfunctional behavior, rather than on attempting to change a dysfunctional personality is recommended. For example, trying to teach a histrionic personality a whole new way of coping with life would be very difficult. When this type of difficulty is encountered in a medical patient, psychotherapy should focus on managing the histrionics to prevent them from disrupting the treatment.

Lastly, chronic pain can lead to a cascade of psychosocial stressors. This can include job loss, disability, withdrawal from social roles within the family, and

*“...chronic pain can lead to a cascade of psychosocial stressors. This can include job loss, disability, withdrawal from social roles within the family, and interference with hobbies and pleasurable activities.”*

interference with hobbies and pleasurable activities. Limitations in functioning can stress the family system,<sup>23,24</sup> and lead to family conflicts if the patient is unable to perform normal family duties.<sup>25,26</sup> Within the context of a healthy, supportive family, these challenges can be overcome. On the other hand, an overly solicitous family may reinforce patient passivity, encouraging the patient to adopt a disabled role.<sup>27,28</sup> For the patient, psychotherapy can focus on finding solutions to these many problems. This might include exploring vocational changes or changing the patient's role within the family. Additionally, sometimes family psychotherapy is helpful, as generally when one member suffers from a serious pain condition, the whole family needs to adjust accordingly. Finally, referral to a support group is often helpful.

The following case is a composite scenario created for heuristic purposes, and will be used to illustrate the process of three-dimensional assessment and treatment.

### **An Illustrative Case With Commentary**

A 34 year-old male sustained a whiplash-type injury in a motor vehicle accident.

He lost control of his vehicle after being struck a glancing blow by a drunk driver, veering off the road and skidding down an embankment. While there was no loss of consciousness, a whiplash-type injury was diagnosed. The physician noted that the patient reported neck pain that radiated into his upper extremities. The patient was provided with a cervical collar, anti-inflammatory medication, and was advised to take some time off of work. He was referred to his PCP for follow-up care. After his PCP released him to return to work on light duty, though, the patient exhibited a high level of absenteeism at work, and also exhibited poor attendance at his medical appointments.

After six weeks, the patient was reporting that his pain level was increasing. The patient was now reporting headaches, and was using more opioid pain medication

than was prescribed. The patient was referred for physical therapy, but he frequently cancelled or did not show up for appointments. When he did attend PT, he resisted exercising and, instead, demanded massage. Overall, he was viewed by the PT as being noncompliant. Additionally, over the course of time, the patient appeared to become progressively more frustrated and somatically preoccupied. About this time, he presented in the emergency room at a local hospital, certain that he was having a heart attack. All cardiac testing was negative however, and he was discharged with the diagnosis of noncoronary chest pain of uncertain etiology.

The PCP referred the patient to a psychologist for further assessment and treatment, but the patient declined to go. The patient insisted that, “I'm not crazy! I don't need to see a shrink! I have real medical problems. This is not in my head!” The patient was also reluctant to take a prescription of SSRI medication for anxiety, denying that he had any anxiety, and instead asserting that something was wrong with his heart. He insisted on further cardiac assessment, but these tests were negative as well. The physician learned that during the patient's spells of tachycardia,

the patient would use his opioid pain medication to calm himself. The physician was concerned that this patient was using the pain medication excessively and, in part, to treat anxiety rather than pain.

### **At the Crossroads: Dealing With a Challenging Patient**

Pain disorders such as the one described above are challenging to treat. When roadblocks to recovery appear, the physician needs to take a different approach to get the patient through the impasse. If the physician allows the patient to take control of the direction of treatment, the risk of a poor outcome is greatly increased.

It is important for the physician to discuss the biopsychosocial nature of pain with the patient early in the course of treatment, and to discuss both the medical and the psychosocial assessment process as well. The reason for this is as follows: suppose the physician never discusses the biopsychosocial nature of pain in the beginning, but instead first exhausts all medical tests. If the medical tests do not fully explain the patient's pain reports, and the physician then refers the patient for a psychological evaluation, the patient may interpret this as an indication that the physician thinks the pain is not real, and that the pain is “all in the patient's head.” Thus, instead of taking a piecemeal approach, there are advantages to discussing an overall plan with the patient early in treatment. This approach communicates to the patient, from the beginning, the true biopsychosocial nature of pain. When the information is presented to the patient this way, early in the course of care, it helps to decrease the potential of resistance to the psychosocial aspects of evaluation and treatment later on.

It is up to the physician to organize the “three-dimensional” assessment process. This may involve referrals to a number of specialists, such as a surgeon, a physiatrist, a pain medicine specialist, a psychiatrist, a physical therapist, a health psychologist, or rehabilitation psychologist. Once the patient has undergone this assessment, the treatment plan can be implemented. How to proceed is determined by the results of the evaluation by these specialists. If the results indicate that there is a clear organic cause to the patient's pain, and medical interventions are indicated, then these should be offered to the patient. Under these circumstances, psychological interventions should focus on managing

**RESULTS AT A GLANCE**

**Global Pain Complaint**

Overall pain at testing 7

**Critical Areas**

- Sleep Disorder
- Chemical Dependency
- Home Life Problems
- Vegetative Depression
- Anxiety/Panic
- PTSD/Dissociation

**Pain Complaints**

Area	
Head (headache pain)	10
Neck or shoulders	10
Jaw or face	9
Arms or hands	8
Abdomen or stomach	7
Chest	3
Middle back	2
Genital area	0
Legs or feet	0
Lower back	0

**Scale Ratings**

Defensiveness	High
Somatic Complaints	Extr High
Pain Complaints	High
Functional Complaints	Mod High
Depression	Average
Anxiety	Extr Low

Copyright © 2002 NCS Pearson, Inc. All rights reserved.  
Reprinted with permission from NCS Pearson, Inc.

**FIGURE 1.** *BBHI™ 2 “Results at a Glance” Portion of Report.* This section, located on the cover page of the BBHI 2 report, provides a quick overview of the test results. The “Overall pain at testing” is what is usually referred to as a VAS score, while the pain area scores provide a localized breakdown of pain complaints. The scale ratings and critical areas sections identify additional significant BBHI 2 test findings.

the patient’s affective distress, coping with pain and other symptoms, and maximizing compliance.

On the other hand, psychological interventions will usually have priority if: 1) the patients symptomatic complaints are inconsistent with the objective medical findings; 2) the patient has not progressed in treatment as expected; and 3) all proposed medical interventions are elective, and intended to reduce subjective complaints of pain or other symptoms. Under these circumstances, a more conservative approach to medical care may be indicated and includes psychological treatment. This is especially true if the patient has a history of noncompliance, overuse of opioids, grossly unrealistic expectations, or severe psychiatric disturbance.

One of the biggest challenges with initiating multidisciplinary assessment or treatment often involves getting the patient to accept a psychological referral. The patient in this case is adamant that he has “real pain” and is “not crazy,” and has no need to discuss his anxiety or stress. He states that he wants a medical cure for his pain, which he conceptualizes as being prescribed stronger pain medication, or having surgery that will “cut out” his pain. However, this suggests that the patient does not understand the biopsychosocial nature of chronic pain. The physician could attempt to address this by offering the following information to the patient:

1. It is generally accepted that chronic

pain is a biopsychosocial disorder. As a result, the comprehensive assessment of pain involves a three-dimensional approach that looks at biological, psychological and social factors affecting pain.

2. If the patient wants the best care, the accepted “gold standard” for the treatment of chronic pain is the multidisciplinary model, which involves physicians, psychologists and other caregivers. Offering the patient less would be substandard care. It is worth noting that most people don’t realize that health psychologists and rehabilitation psychologists work primarily with patients with medical diagnoses, so this should be addressed.

3. Being asked about psychological matters or being referred to a psychologist does not mean that the physician believes that the patient is “crazy.” Stress, muscular bracing, insomnia, depression, anxiety, and related conditions all affect pain disorders. Recognizing and addressing problems such as these are an important part of the recovery process, and psychologists offer treatment for these sorts of conditions.

4. Research shows that behavioral management techniques are better than medication for some conditions. For example, behavioral treatment of insomnia has been found to be more effective than taking medication, and does not have the side effects.<sup>29,30</sup> Psychotherapy for pain or stress management, muscle tension, depression, anxiety and other conditions have also been shown to be effective.

For patients who worry about taking medications, or who prefer natural methods, psychologists offer alternative approaches.

5. Adjusting to a severe medical condition can involve making many difficult decisions (such as switching to a different career that is consistent with medical restrictions) and making a number of lifestyle changes. A psychologist can help the patient explore these alternatives and make the best decisions.

6. If the patient is facing further surgery or other medical procedures, a presurgical psychological evaluation can often help to identify risk factors that may affect outcome. If further surgery is being contemplated, in some cases psychological preparation can lead to improved outcomes. This can include tobacco cessation, stress management and other forms of treatment. Let the patient know that this process has been shown to reduce the risk of a poor surgical outcome.<sup>31</sup>

7. Sometimes the role of the psychologist is to help the patient’s family to adjust to the patient’s new medical limitations.

8. Sometimes it is nice just to have a professional to talk to about everything that is happening.

9. For many patients, the phrase “psychological evaluation” is intimidating. Because of this, within the field of health psychology, the phrase “behavioral medicine consultation” is often used instead. Substituting this phrase may decrease the patient’s resistance to a referral.

	Measure	Description
<b>SCALES</b>	Pain Complaints	A high score indicates the report of severe pain in numerous body areas. If there are no objective medical findings explaining these pain reports, it may indicate pain preoccupation or a somatoform pain disorder.
	Somatic Complaints	Measures physical symptoms associated with autonomic arousal, anxiety, depression, and somatoform disorders. High scores are difficult to explain medically, and suggest somatization.
	Functional Complaints	High scores indicate perceived disability. If the patient seems to be more disabled than would be expected given objective medical information, he/she may be inclined to assume a disabled role.
	Depression	Measures the level of depressive thoughts and feelings
	Anxiety	Measures the level of anxious thoughts and feelings
	Defensiveness	High defensiveness may indicate reluctance to disclose sensitive information, or a desire to downplay problems. A low score suggests lowering of defenses, which may indicate a cry for help, or a propensity to complain.
<b>ADDITIONAL PAIN DIMENSIONS</b>	Pain Now	This is the equivalent of a VAS score.
	Pain Complaints Areas	Reports of localized pain in 10 body areas.
	Highest Pain	Highest overall (global) pain in the last month.
	Lowest Pain	Lowest overall pain in the last month.
	Peak Pain	The highest pain report, whether local or global.
	Pain range	This score represents how much a patient's pain fluctuated over the course of the last month. Pain Range = (High Pain) – (Low Pain)
	Maximum Tolerable Pain	The highest level of pain the patient is willing to tolerate and still work.
	Pain Tolerance Index (PTI)	How much a patient's pain needs to change in order to be tolerable. This connects the patient's inner world of subjective pain with the outer world of disability behavior. PTI = Peak Pain - Maximum Tolerable Pain
<b>CRITICAL AREAS</b>	15 Critical Items	Vegetative depression, suicidal ideation, panic, death anxiety, PTSD, sleep disorder, compensation focus, chemical dependency, doctor dissatisfaction, psychosis, satisfaction with care, perceived disability, pain fixation, home life problems, random responding

TABLE 2: BBHI 2 Measures

**Biopsychosocial Assessment Tools For The Physician**

Sometimes patients are reluctant to accept a psychological referral. In other cases, the patient is willing, but there are no psychologists in the area who specialize in chronic pain. In either case, one option is that the physician may choose to take steps to initiate the psychosocial assessment process. A helpful part of the evaluation process can be the use of various psychological questionnaires. While psychologists and psychiatrists have traditionally performed the psychological assessment, an increasing number of nonpsychiatric physicians are doing this as well. Psychological questionnaires of this type have been shown to have considerable value, being roughly equivalent to medical tests in their ability to diagnose and predict outcomes.<sup>32</sup> For example, a recent study found that psychometric assessment was better than either MRI's or discography in predicting future back pain disability.<sup>33,34</sup>

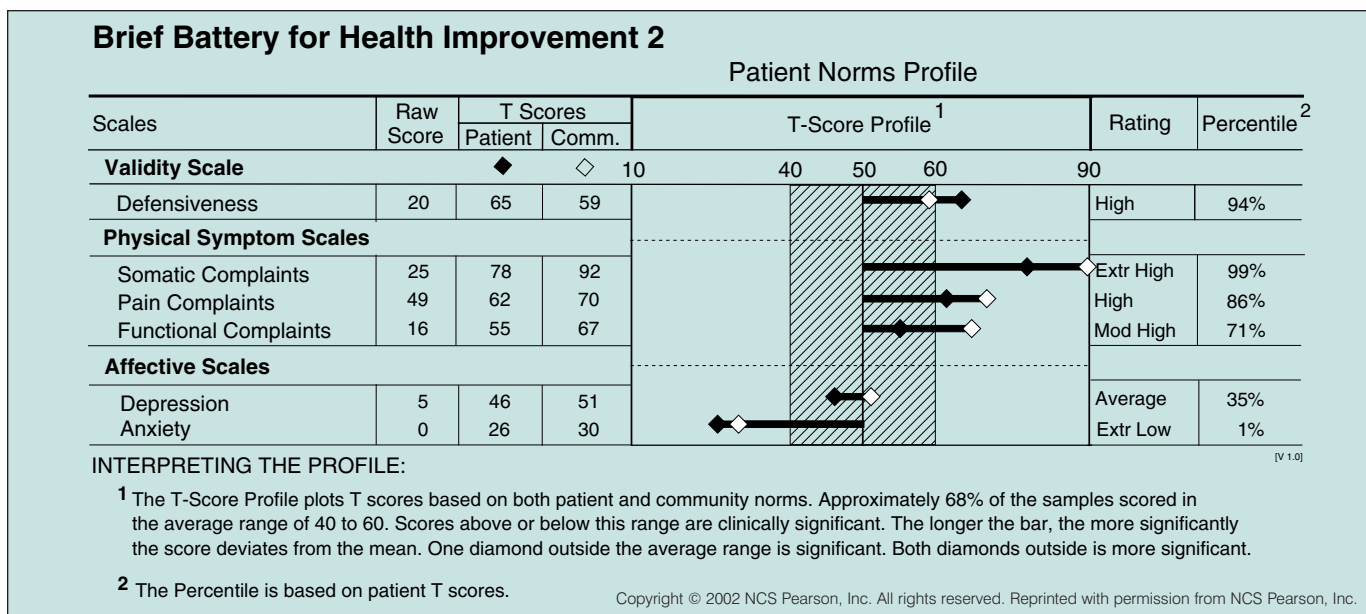
There are some questionnaires that are specifically designed for use by physicians, such as the PRIME MD.<sup>35</sup> This assessment tool is widely used and researched. However, this tool has the disadvantage that it was not designed to assess chronic pain patients, has not gone through a formal standardization process, and requires time for hand scoring. Psychological assessment tools designed for patients with chronic pain include the Pain Patient Profile (P-3<sup>®</sup>),<sup>36</sup> the Battery for Health Improvement 2 (BHI<sup>™</sup> 2),<sup>37</sup> and the Brief Battery for Health Improvement 2 (BBHI<sup>™</sup> 2).<sup>38</sup> These three instruments have the advantages of being designed for use with pain patients, they can be administered and scored electronically, and are all psychometric tests

which produce standardized scores. Beyond these, there are also psychometric questionnaires designed for medical patients in general, such as the Millon Behavioral Medicine Diagnostic (MBMD<sup>™</sup>),<sup>39</sup> as well as more general instruments for the assessment of psychopathology such as the Minnesota Multiphasic Personality Assessment Inventory-2<sup>™</sup> (MMPI-2<sup>™</sup>)<sup>40</sup> or the Personality Assessment Inventory<sup>™</sup> (PAI<sup>®</sup>).<sup>41</sup>

In the illustrative case being discussed, the physician initiated the biopsychosocial assessment process by administering a BBHI 2 test. Along with the P-3, the BBHI 2 is a physician-friendly tool that can be administered by a handheld electronic device. The BBHI 2 takes about 10 minutes of patient time, can be completed while the patient waits to see the doctor, and produces an immediate computerized analysis of the patient's responses. The BBHI 2 assesses not only psychosocial aspects of the patient's condition, but also offers a standardized, multidimensional assessment of pain, and a standardized assessment of functioning as well. The BBHI 2 measures are described in Table 2.

**Illustrative Results of Psychological Assessment**

This patient was administered a BBHI 2 electronically while waiting to see his physician, and the results were provided to the physician prior to seeing the patient. The BBHI 2 results provided a standardized assessment of pain, with the overall amount of pain reported being greater than 90% of a national sample of patients in rehabilitation. The patient was reporting a somewhat diffuse distribution of pain, with six body areas being in-



**FIGURE 2: BBHI™ 2 “Patient Norms Profile” Portion of Report.** The Patient Norms Profile section of the report is a graphical representation of a patient’s BBHI 2 results, with the shaded area in the middle depicting the average range. One diamond outside the average range is significant, while both diamonds outside is more significant – this is an important rule of thumb for interpreting the profile information.

volved. The BBHI 2 “Result at a Glance” section is displayed in Figure 1.

The overall pain level at testing was a 7, with a Peak Pain of 10 and a low of 6 in the last month. Significantly, the pain tolerance index was -8, meaning that the patient felt that the Peak Pain must be reduced by 8 points in order to prevent the pain from interfering with normal functioning. This patient reported a higher level of problems with functioning than did 88% of the same national sample of patients. The percentile rank information is displayed in the BBHI 2 profile shown in Figure 2.

The BBHI 2 results also showed that the level of Somatic Complaints was higher than that seen in 99% of patients. This suggests the possibility of somatic preoccupation or somatization. Despite this high level of pain and somatic distress, however, the patient’s Anxiety score was at the 1st percentile rank, indicating that this patient was reporting a remarkably low level of anxiety, so low as to be seen in only 1% of patients. The BBHI 2 computerized interpretation points out that scores in this range are questionable, and are more likely to suggest a tendency to deny anxious feelings. In contrast, the Depression score was in the average range.

This patient also exhibited a high score on the BBHI 2 Defensiveness scale. This is a validity scale, which conveys important information about how the patient approached this questionnaire. The high score here suggests that he approached this questionnaire with a defensive attitude, probably portraying aspects of his life in an unrealistically positive fashion. This helps to explain why he portrayed himself as being totally without any fears or worries. Patients who are defensive like this may be guarded, and feel embarrassed about conveying personal information about their lives.

Prior to meeting with the patient, the physician reviewed the BBHI 2 results. The physician also provided the patient with a part of the computerized BBHI 2 report intended expressly for patient feedback. It conveyed to the patient, in a nonthreaten-

ing way, the results of the BBHI 2. One of the things that it pointed out was that the test results said that he appeared to be a private person, who is cautious about sharing personal information with others. It also encouraged the patient to try to share his feelings with his physician. Based on the BBHI 2 results, the physician also made it a point to reassure the patient, encouraging him to share what was bothering him, and to not be embarrassed.

In the interview that followed, the patient revealed that in his family of origin, being afraid or having emotional weaknesses was considered to be a shameful thing. The patient admitted that he felt very tense, out of control, short of breath, and worried that something terrible was wrong with him. He did not recognize these as being anxiety symptoms. The patient was thus reporting core components of the somatizing process: his intense emotions went unrecognized, and instead were misperceived as being symptoms of an underlying medical condition. This is also sometimes referred to as “alexithymia” (meaning “without words for feelings”), a condition where an individual has never acquired the ability to verbally express emotions, and further may not recognize emotional experiences either. Under these circumstances, the physical correlates of intense emotions are misperceived as being symptoms of illness or injury. Thus, the patient did not recognize his anxiety, and instead thought he was having repeated heart attacks. Because of this fear, he resisted exercising. He also gravitated towards massage for reasons he did not recognize. Although the massage did not benefit his neuropathic pain, massage did act to calm him and, in so doing, decreased his muscular bracing. This in turn acted to provide short-term relief for his headaches, which were judged to be partially attributable to chronic muscle contraction.

Examination of the BBHI 2 critical items helped to further explain this patient’s profile. This patient endorsed critical items having to do with a pounding heart, and feelings of unreality. The physician did not find any medical explanation for these

heart palpitations. When asked about this symptom, the patient revealed that these palpitations occurred primarily while driving. The reported feelings of unreality also occurred during these episodes. These feelings were judged to be dissociative symptoms attributable to anxiety attacks that appeared after the accident. Additionally, the patient also reported that he had been having nightmares about the accident, which suggested that he was suffering from PTSD. The patient was extremely troubled by these symptoms, but was even more concerned that someone would say that he was “crazy.” The patient admitted that he had been self-medicating his anxiety symptoms with a combination of opioid pain medication and alcohol. The physician also asked about the home life concerns indicated by the BBHI 2. The patient admitted that his overuse of alcohol had led to some intense conflicts with his wife.

As a result of the overall biopsychosocial assessment, the patient was diagnosed with having a whiplash-type cervical injury, which resulted in neuropathic pain symptoms in his left arm. The patient was also diagnosed as having PTSD. Associated with the PTSD was a phobia of driving in traffic, as this tended to elicit PTSD flashbacks with acute anxiety and tachycardia, which the patient misinterpreted as being a sign of a heart condition. Also, the jaw pain the patient was reporting on the BBHI 2 appeared to be associated with bruxing in his sleep, which was worse on the nights that he was having more PTSD nightmares. The patient’s headaches were judged to be partly attributable to the whiplash injury, but aggravated by stress-related muscular bracing in his neck and shoulders. The chronic muscle contraction in his neck exacerbated the headaches from the whiplash, and was also judged to be contributing to the “knots” he felt in his intrascapular muscles. The patient did not even know what it was.

It is important to note that, as a result of the three-dimensional evaluation, it was determined that the patient’s poor attendance was not attributable to noncompliance. Instead, his poor attendance was due to untreated PTSD, with an associated fear of driving. The patient did not report this to his physician, because he did not understand his condition, and was embarrassed about his symptoms.

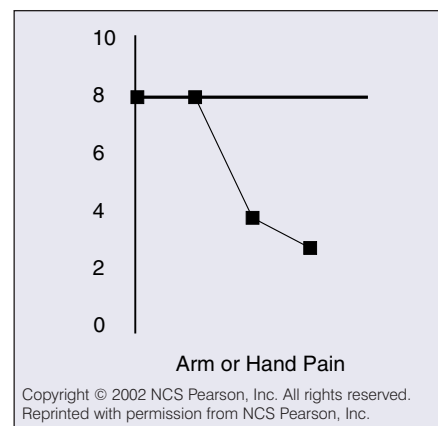
### Illustrative Treatment Plan

Once a three-dimensional biopsychosocial assessment has been accomplished, developing an effective treatment plan is much easier. Viewing the patient in “3-D” puts all of the patient’s symptoms into a new perspective. The physician reviewed the results of all the medical tests, and identified the medical as well as psychosocial treatment options. The nature of these options was discussed with the patient, and a decision was made together about a treatment plan. The physician used a simple form specifying the overall plan, and this was shared with the patient (see Appendix A).

The patient had been overusing opioids, and was worried about becoming dependent on them. He agreed to an opioid contract and, as an alternative, he was referred for an evaluation for treatment with a neurostimulator. However, it was decided that his PTSD should be treated first since, because of his driving phobia, he frequently missed his medical appointments. The physician prescribed medications for PTSD and insomnia which, in turn, reduced the patient’s desire for the opioid medication.

The patient also finally accepted a referral to a psychologist, who, after further evaluation, offered a combination of treatments. This included biofeedback and relaxation training for anxiety and muscular bracing, cognitive psychotherapy for PTSD, sleep hygiene training for his insomnia, and systematic desensitization for his driving phobia. Additionally, psychotherapy targeted the patient’s belief that a pain level above 2 was intolerable, and worked towards helping the patient increase his ability to tolerate pain. Psychotherapy also focused on helping the patient to realize that he was not “going crazy,” but rather suffering from psychological conditions that are commonly seen in accident victims.

The patient continued to suffer from neuropathic pain in his left arm, which he no longer viewed as an indication of a heart attack. The patient was subsequently referred back to an interventional pain physician, who now viewed the patient as being a much better candidate for neuromodulation. He later underwent a successful trial and responded positively to implantation. Repeat administrations of the BBHI 2 showed a decrease of neck and headache pain after treatment with PT, biofeedback and medications. These re-



**FIGURE 3: BBHI™ 2 “Progress Report”**  
 The BBHI 2 Progress Report tracks changes in a patient’s scale scores over time. This example illustrates a decrease in upper extremity pain following a successful trial of neuromodulation.

sults were portrayed in the pain part of the BBHI 2 progress report. Following the referral for neuromodulation, the patient reported a sharp decrease in upper extremity pain as well. The BBHI 2 was later used to track these changes in pain as well (see Figure 3).

It should be pointed out that not all cases resolve this easily. A patient may need to be provided with treatment boundaries. For example, the patient will not be allowed to use opioids excessively if rejecting other promising forms of treatment. If a patient has been noncompliant and is not getting better, the possible cause and effect relationship between these two factors should be pointed out: If the patient had been compliant, the condition may have responded to treatment. If the patient accepts the treatment plan, it is important to follow through with it and to not allow the patient to later unreasonably refuse parts of it. If the patient is unwilling to be compliant, though, the prognosis is poor. Under such circumstances, the physician must carefully consider whether or not it is advisable to continue treating the patient, especially in cases where the patient continues to use opioid pain medication excessively.

### Summary

Research suggests that pain may be the most common single symptom seen in primary care. The majority of acute pain symptoms have a clear physical cause, and the treatment of these conditions is relatively straightforward. On the other hand, a small percentage of acute pain condi-



tions go on to become chronic. In contrast to acute pain, chronic pain can be mysterious and intractable, and is often very expensive to treat. The complexity of chronic pain stems from the fact that it is a biopsychosocial condition, which occurs in various forms, and which often follows a distinct natural history.

Since pain is a biopsychosocial condition, all aspects of the condition must be treated. Assuming that a condition is “all in the patient’s head” makes the mistake of overlooking possible organic pain generators. On the other hand, failure to assess the psychosocial dimensions can also lead to delayed recovery. The complex nature of chronic pain disorders often makes it impossible for a single professional to treat it successfully.

Assessing all three dimensions of pain — biological, psychological and social — can put the patient’s condition in a new perspective, and increases the likelihood of a positive outcome. Patients with chronic pain conditions are often unaware of the extent to which stress, anxiety, depression and other psychosocial factors affect their pain condition. It is important for physicians to educate their patients about this, and to take steps to systematically evaluate the patient’s pain complaints and psychosocial complications.

Physicians commonly use a variety of medical tests to assess patients with pain. However, they often overlook the use of psychometric questionnaires, which can be used not only to assess the psychological and social aspects of the patient, but also for the standardized assessment of pain, functioning and somatic complaints, and for tracking response to treatment. These tests have been shown to have considerable scientific value, and play an important role in the three-dimensional assessment process. As noted above, research has found that these tests can be powerful predictors of outcome, exceeding the predictive power of commonly used medical tests, such as MRI’s and discography. It follows from this that, for patients with chronic pain, psychological questionnaires should be used as routinely as MRIs and other medical assessments.

These questionnaires have traditionally been administered by psychologists. However, medically-oriented questionnaires, advances in technology (such as hand-held electronic administration), and computerized interpretation now makes it possible to integrate some of these tools with-

APPENDIX A

Chronic Pain Treatment Plan Patient Name: \_\_\_\_\_

Physician: \_\_\_\_\_

Caregiver Plan

Recommended referral (circle all that apply)

Surgical    Physiatry    PT/OT    Behavioral Medicine    Psychiatry    Pain Medicine

Alternative Medicine: \_\_\_\_\_

Medical tests: \_\_\_\_\_    Medical questionnaires: \_\_\_\_\_

Treatment modalities and procedures (circle all that apply)

Opioid pain medication	Sleep hygiene training
Other pain medication	Biofeedback/relaxation training
Antidepressant medication	Alternative medicine
Insomnia medication	PT/Strength training
Other medications	TENS
Pain management	Neurostimulation
Stress management	Other _____

Patient Responsibilities

You are an important part of the team. While your caregivers will do their best to help you, and will be offering a variety of treatments, they depend on you to follow through with their recommendations. To maximize your chances of recovery, your job will be to see all the caregivers you are referred to, attend each appointment, take your medications as prescribed, and make your best effort in the treatment that is offered. It is generally accepted that multidisciplinary treatment, or seeing several different types of caregivers, lead to the best outcomes. If for some reason this is difficult to do, or if something is not working for you, it will be important for you to discuss that with your doctor.

Patient Signature: \_\_\_\_\_    Date: \_\_\_\_\_

in the fast pace of the medical setting.

Chronic pain is a costly condition, made more costly when diagnostic methods fail to assess all three dimensions of pain. In some cases, caregivers may declare that the pain is “real,” and the psychosocial dimensions are disregarded. In other cases, the patient may be told that the pain is “in your head,” and the medical dimension is disregarded. However, research now provides compelling evidence that “real” versus “in your head” is a false dichotomy, and that all three dimensions should be taken into account.

Pain is a subjective sensory experience that is closely associated—psychologically, neurologically, and biochemically—with affect, cognition and aspects of the patient’s social environment. Failure to

appreciate this fact can lead to having only a partial understanding of the factors contributing to pain, and consequently, to failed interventions. This is costly both in monetary terms, and in terms of the frustration subsequently experienced by both patient and physician.

The old maxim, “Diagnosis precedes treatment” remains true. In the case of pain disorders, though, diagnosis should not only precede treatment, but it should be pursued in all three dimensions. ■

BBHI 2 is a trademark of NCS Pearson, Inc.

*Dr. Disorbo is a psychologist who specializes in the treatment of chronic pain patients exhibiting delayed recovery. He has worked for over 20 years at an interdisciplinary outpa-*

tient clinic, *Integrated Therapies in Denver, Colorado*. During that time, he has been an active member of the American Academy of Psychophysiology and Biofeedback and has received extensive training in self-regulation techniques. Dr. Disorbio also works as a consultant to major medical corporations, conducts workshops to train physicians in the assessment and treatment of biopsychosocial pain disorders, and serves on the board of the National Pain Foundation. Dr. Disorbio is the coauthor of the BHI 2, the BBHI 2, and the Momentary Pain Scale tests. Dr. Disorbio is also the cofounder of 3D Assessments.

Dr. Bruns is a psychologist who works with Health Psychology Associates in Greeley, Colorado. He has worked with chronic pain patients for over 20 years and has also worked in work hardening and functional restoration rehabilitation programs. He has served on four Colorado state task forces with the mission to create evidence-based medical guidelines for patients with chronic pain and other conditions. Dr. Bruns has taught graduate school classes in psychopathology and psychological assessment, currently works as a consultant to major medical corporations, and conducts workshops to train physicians in the assessment and treatment of biopsychosocial pain disorders. Dr. Bruns is the webmaster of healthpsych.com, and is the coauthor of the BHI 2, the BBHI 2, and the Momentary Pain Scale tests. Dr. Bruns is also the cofounder of 3D Assessments.

Dr. Barolat is a neurosurgeon who completes a fellowship in Functional Neurosurgery and Neurostimulation at the Mount Sinai Medical Center in Miami, Florida, and is certified by both the American and the Italian Board of Neurosurgery. Dr. Barolat has been the author of over 60 medical articles and book chapters. He has lectured extensively nationally and internationally. Dr. Barolat was President of the International Neuromodulation Society for two consecutive terms and is on the Board of the American Neuromodulation Society and on the Editorial Board of the Journal, *Neuromodulation*. He is currently Director-at-large of the International Neuromodulation Society. Dr. Barolat is one of the world leaders in the area of neuro-implantable technologies for the management of pain and motor disorders. He is also one of the pioneers of spinal cord stimulation for spasticity and pain management. Dr. Barolat was professor of Neurosurgery, Director of Neurosurgical Services and Director of the Division of Functional Neurosurgery at Thomas Jefferson University until December 2004. Dr. Barolat is currently practicing neurosurgery and neuromodulation in Denver, Colorado, and is affiliated with Skyridge Med-

ical Center. He is the CEO and Director of the Barolat Institute.

References

1. National Center for Health Statistics. *Vital health statistics: Reporting chronic pain episodes on health surveys*. In: Centers for Disease Control: US Department of Health and Human Services, ed. Vol Series 6: Cognition and survey measurement. 1992.
2. Smith BH, Elliott AM, and Hannaford PC. Is chronic pain a distinct diagnosis in primary care? Evidence arising from the Royal College of General Practitioners' Oral Contraception study. *Fam Pract*. Feb 2004. 21(1):66-74.
3. Fishman P, Von Korff M, Lozano P, and Hecht J. Chronic care costs in managed care. *Health Affairs*. 1997. 16(3):239-247.
4. Loeser JD. Economic implications of pain management. *Acta Anaesthesiol Scand*. Oct 1999. 43(9):957-959.
5. International Association for the Study of Pain. Task Force on Taxonomy, Merskey H, Bogduk N. *Classification of chronic pain*. 2nd ed. IASP Press. Seattle. 1994.
6. Spengler DM, Bigos SJ, Martin NA, Zeh J, Fisher L, and Nachemson A. Back injuries in industry: a retrospective study. I. Overview and cost analysis. *Spine*. Apr 1986. 11(3):241-245.
7. Frymoyer JW and Cats-Baril WL. An overview of the incidences and costs of low back pain. *Orthop Clin North Am*. Apr 1991. 22(2):263-271.
8. Gallagher RM. Biopsychosocial pain medicine and mind-brain-body science. *Phys Med Rehabil Clin N Am*. Nov 2004. 15(4):855-882, vii.
9. Bruns D and Disorbio JM. Chronic pain and biopsychosocial disorders: The BHI 2 approach to classification and assessment. *Practical Pain Management*. November/December 2005. 5(7):52-61.
10. Gatchel RJ, Polatin PB, Mayer TG, and Garcy PD. Psychopathology and the rehabilitation of patients with chronic low back pain disability. *Arch Phys Med Rehabil*. Jun 1994. 75(6):666-670.
11. American College of Occupational and Environmental Medicine., Glass LS. *Occupational medicine practice guidelines : evaluation and management of common health problems and functional recovery of workers*. 2nd ed. OEM Press. Beverly Farms, MA. 2004.
12. Turk DC and Flor H. Chronic pain: A biobehavioral perspective. In: Gatchel RJ, Turk DC, eds. *Psychosocial factors in pain: Critical perspectives*. Guilford. New York. 1999.
13. Carter LE, McNeil DW, Vowles KE, et al. Effects of emotion on pain reports, tolerance and physiology. *Pain Res Manag*. Spring 2002. 7(1):21-30.
14. Rome HP, Jr and Rome JD. Limbically augmented pain syndrome (LAPS): kindling, corticolimbic sensitization, and the convergence of affective and sensory symptoms in chronic pain disorders. *Pain Med*. Mar 2000. 1(1):7-23.
15. Zelman DC, Howland EW, Nichols SN, and Cleeland CS. The effects of induced mood on laboratory pain. *Pain*. Jul 1991. 46(1):105-111.
16. Gehi A, Haas D, Pipkin S, and Whooley MA. Depression and medication adherence in outpatients with coronary heart disease: findings from the Heart and Soul Study. *Arch Intern Med*. Nov 28, 2005. 165(21):2508-2513.
17. Bigos SJ, Battie MC, Spengler DM, et al. A longitudinal, prospective study of industrial back injury reporting. *Clin Orthop Relat Res*. Jun 1992. (279):21-34.
18. Gray PB. Deluxe doctors. *Fortune Small Business*. July 18, 2004.
19. Higgins ES. A review of unrecognized mental illness in primary care. Prevalence, natural history, and efforts to change the course. *Arch Fam Med*. Oct 1994. 3(10):908-917.
20. Gracely RH, Geisser ME, Giesecke T, et al. Pain catastrophizing and neural responses to pain among persons with fibromyalgia. *Brain*. Apr 2004. 127(Pt

- 4):835-843.
21. Boothby JL, Thorn BE, Overduin LY, and Ward LC. Catastrophizing and perceived partner responses to pain. *Pain*. Jun 2004. 109(3):500-506.
22. Basler HD, Jakle C, and Kroner-Herwig B. Incorporation of cognitive-behavioral treatment into the medical care of chronic low back patients: a controlled randomized study in German pain treatment centers. *Patient Educ Couns*. 1997. 31(2):113-124.
23. Hamberg K, Johansson E, Lindgren G, and Westman G. The impact of marital relationship on the rehabilitation process in a group of women with long-term musculoskeletal disorders. *Scand J Soc Med*. Mar 1997. 25(1):17-25.
24. MacGregor EA, Brandes J, Eikermann A, and Giannararo R. Impact of migraine on patients and their families: the Migraine And Zolmitriptan Evaluation (MAZE) survey—Phase III. *Curr Med Res Opin*. Jul 2004. 20(7):1143-1150.
25. Kemler MA and Furnee CA. The impact of chronic pain on life in the household. *J Pain Symptom Manage*. May 2002. 23(5):433-441.
26. Harris S, Morley S, and Barton SB. Role loss and emotional adjustment in chronic pain. *Pain*. Sept 2003. 105(1-2):363-370.
27. Kerns RD, Haythornthwaite J, Southwick S, and Giller EL, Jr. The role of marital interaction in chronic pain and depressive symptom severity. *J Psychosom Res*. 1990. 34(4):401-408.
28. Block AR, Kremer EF, and Gaylor M. Behavioral treatment of chronic pain: the spouse as a discriminative cue for pain behavior. *Pain*. Oct 1980. 9(2):243-252.
29. Jacobs GD, Pace-Schott EF, Stickgold R, and Otto MW. Cognitive behavior therapy and pharmacotherapy for insomnia: a randomized controlled trial and direct comparison. *Arch Intern Med*. Sep 27 2004. 164(17):1888-1896.
30. Silber MH. Clinical practice. Chronic insomnia. *N Engl J Med*. Aug 25 2005. 353(8):803-810.
31. Block AR, Ohnmeiss DD, Guyer RD, Rashbaum RF, and Hochschuler SH. The use of presurgical psychological screening to predict the outcome of spine surgery. *Spine*. Jul-Aug 2001. 1(4):274-282.
32. Meyer GJ, Finn SE, Eyde LD, et al. Psychological testing and psychological assessment. A review of evidence and issues. *Am Psychol*. Feb 2001. 56(2):128-165.
33. Carragee EJ, Alamin TF, Miller JL, and Carragee JM. Discographic, MRI and psychosocial determinants of low back pain disability and remission: a prospective study in subjects with benign persistent back pain. *Spine*. Jan-Feb 2005. 5(1):24-35.
34. Carragee EJ, Barcohana B, Alamin T, and van den Haak E. Prospective controlled study of the development of lower back pain in previously asymptomatic subjects undergoing experimental discography. *Spine*. May 15 2004. 29(10):1112-1117.
35. Spitzer RL, Kroenke K, Linzer M, et al. Health-related quality of life in primary care patients with mental disorders. Results from the PRIME-MD 1000 Study [see comments]. *Jama*. 1995. 274(19):1511-1517.
36. Tollison D and Langley JC. *Pain Patient Profile Manual*. Pearson Assessments. Minneapolis. 1995.
37. Bruns D and Disorbio JM. *Battery for Health Improvement 2 Manual*. Pearson Assessments. Minneapolis. 2003.
38. Disorbio JM and Bruns D. *Brief Battery for Health Improvement 2 Manual*. Pearson Assessments. Minneapolis. 2002.
39. Millon T, Antoni M, Millon C, Meagher S, and Grossman S. *Millon Behavioral Medicine Diagnostic Manual*. Pearson Assessments. Minneapolis. 2001.
40. Butcher JN. *Minnesota Multiphasic Personality Inventory -2 User's Guide*. Pearson Assessments. Minneapolis. 1989.
41. Morey LC. *PAI Professional Manual*. Lutz, *Psychological Assessment Resources*. Florida. 1991.