Psychosomatic Pain: New Insights and Management Strategies

Jay J. Rubin, MD

Abstract: At least 40 to 60 percent of women and at least 20 percent of men with chronic pain disorders report a history of being abused during childhood and/or adulthood. This incidence of abuse is two to four times higher than in the general population. Patients with more severe or frequent abuse, usually during childhood and worse if sexual in nature. often develop specific syndromes or combinations of syndromes. These syndromes include posttraumatic stress disorder, fibromyalgia, and other conditions characterized by repression, somatization, and increased utilization of medical care. Psychosomatic symptoms and dysfunctional behaviors may emerge as these patients seek attention and validation of their suffering, while paradoxically repressing painful memories of trauma. Behavioral observations and key features of the physical examination may greatly help the clinician identify both the presence and severity of psychosomatic disease. In addition, it is very interesting that various studies document physiologic changes in the brains of patients with a history of abuse and in patients with a diagnosis of fibromyalgia. These studies suggest that abuse may physiologically and developmentally increase a person's susceptibility to pain and that some organic changes may be associated with psychogenic disease.

Diagnosis and treatment of even the most challenging patients with chronic pain is much more effective if it includes (a) careful inquiry about any history of past or present abuse or other severe trauma, (b) empathy and constructive validation of disease and suffering, (c) recognition of dysfunctional pain behaviors and personality traits, (d) documentation of nonanatomic as well as anatomic features on examination, (e) multidisciplinary treatments including psychotherapy whenever indicated, and (f) noninvasive procedures and alternatives to potentially habit-forming medications whenever possible and appropriate. Furthermore, it has been shown that helping patients gain insight about the relationship between abuse and their current symptoms leads to decreased health care utilization. Practical guidelines are provided for identifying psychopathology, communicating effectively, and achieving better treatment outcomes for these unfortunate patients.

Key Words: chronic pain, fibromyalgia, posttraumatic stress disorder, psychosomatic, somatization

From Neurological Associates, Ocala, FL.

Reprint requests to Dr. Jay J. Rubin, Neurological Associates, 2685 SW 32nd Place, Suite 100, Ocala, Florida 34474. Email: Jrubin352@aol.com

Dr. Rubin has no disclosures to declare.

0038-4348/0−2000/9800-1099

Pain is subjective and influenced greatly by prior experiences, and pain is real. Pain associated with organic (objective) pathology is more easily explained and treated. However, pain that is atypical or unexplainable is usually a source of greater confusion and frustration. This is particularly true when it occurs in patients who are highly focused upon symptoms and who may become upset when presented with what is perceived to be "no diagnosis." Clinicians are compelled to respond to pain regardless of the etiology, and recently there have been political pressures upon hospital and other medical facilities to treat pain more aggressively. A deeper understanding of psychosomatic pain and somatization behaviors will provide the clinician with the necessary tools to be more confident and effective in managing pain of all etiologies.

Chronic pain patients have an increased incidence of being emotionally, physically, or sexually abused. The underlying psychopathology may involve posttraumatic stress disorder, and this may explain the personality traits and dramatic behaviors often exhibited by certain patients with chronic pain disorders. It is theorized that (a) somatization and dysfunctional behaviors emerge as patients repress pain-

Key Points

- A history of abuse may be identified in more than 40% of women and 20% of men with chronic pain.
- Patients with chronic pain, particularly those with excessive or dramatic symptoms, should routinely be asked about a history of abuse.
- A history of physical abuse during childhood and/or adulthood may be associated with posttraumatic stress disorder, fibromyalgia, and other diseases characterized by repression, excessive somatization and increased utilization of health care.
- Observation and documentation of dysfunctional behaviors and key features of the physical examination may provide important evidence of psychogenic disease.
- Even when chronic pain is associated with significant psychopathology, improved treatment outcomes may be achieved by accepting the patient's symptoms as real and by providing empathy, validation, and multidisciplinary therapies.

ful memories, yet seek attention and validation of their suffering, and (b) many observable behaviors cataloged in this article can be documented and utilized to facilitate proper diagnosis and treatment of even the most challenging patients with chronic pain.

Classification of Pain

Symptoms associated with objective findings are usually easily explained using medical guidelines and terminology. Symptoms which are not associated with objective findings may still be easily explained if there are features which correspond to known anatomic pathways or physiologic disorders. However, symptoms are likely to be psychogenic when there are limited or no objective findings and when there are features which do not correspond to known anatomic pathways or physiologic disorders. These distinctions should serve as clues to the clinician that there may be a need to be more persistent in exploring the psychosocial history of a patient. A practical and simple classification of pain should facilitate this evaluation plus provide a framework for documentation and communication.

Pain (each symptom) may be divided into four general diagnostic categories. The following discussion is directed primarily toward pain which is considered nonanatomic or largely psychogenic (categories 3 and 4 below). The terms "anatomic" and "nonanatomic" are selected because of the applications discussed above and because the terms are commonly used in medical reports including disability/impairment examinations. Anatomic features are those which correspond to known physiologic patterns and pathways. Objective findings are those which are reproducible on physical examination (ie, deep tendon reflexes) or through diagnostic tests (ie, imaging studies). This is distinguished from subjective findings which are comprised of information reported by the patient (ie, symptoms, or responses given during the sensory examination). Strategies for documenting a variety of pain behaviors and conducting the physical examination are provided in the "Behavioral Observations" section of this paper. The proposed categories are as follows:

(1) **Pain with anatomic features and objective findings.** This diagnosis is more obvious and is supported by the physical examination and test results. Examples include lumbosacral radiculopathy, carpal tunnel syndrome, and shingles diagnosed with characteristic skin lesions.

(2) **Pain with anatomic features and without objective findings.** This diagnosis is made primarily through clinical impression, rather than test results. The history alone may be sufficient to make the diagnosis because the symptoms correlate with physiologic disease and anatomic patterns. Examples include classic migraines, trigeminal neuralgia, and shingles when diagnosed without skin lesions.

(3) **Pain with nonanatomic features associated with stress and somatization.** This is suggested by a constellation of symptoms, psychosocial history, limited or absent objective abnormalities, inconsistent details obtained during the history and/or examination, or bizarre findings on physical examination. The patient may be highly focused upon a few symptoms or a multitude of symptoms. The associated behaviors are considered to be primarily "subconscious" or unintentional. Symptoms commonly include a variety of musculoskeletal disorders such as fibromyalgia syndrome, tension headaches, or chronic neck or back pain. Conversion disorder could be considered a more extreme example.

(4) **Pain with nonanatomic features associated with perceived physical injury and symptom magnification.** These symptoms are often numerous, inconsistent, contrary to normal physiologic principles, and/or disproportionate to the objective findings. The associated behaviors are generally considered to reflect some degree of "conscious" deception or "malingering." Soft tissue injuries with sprains or strains are common, and there is often a history of prior accidents and injuries. In addition, these symptoms tend to be more chronic and dramatic, particularly if litigation or other secondary gain is involved. However, pre-existing psychopathology and more obscure forms of secondary gain may still play a significant role. Examples of this type of pain include symptoms which may be coupled with inconsistent findings on physical examination and a history suggesting a relatively minor injury, such as chronic posttraumatic headaches, neck pain ("whiplash"), back pain, or weakness in an extremity. Comparing the observation of spontaneous behaviors with the findings on physical examination is usually the most important means of confidently identifying patients in this category (spontaneous movements are often performed much better than those during formal examination).

Psychological Aspects of Chronic Pain

Pain is a very common complaint in any medical practice, yet the evaluation and treatment of patients with chronic pain is often frustrating and even intimidating. This is probably because clinicians (a) dislike problems which are "unexplainable," (b) often have difficulty recognizing nonanatomic features on examination, (c) fear missing the diagnosis of an underlying organic disease, (d) are uncomfortable or unfamiliar with various treatment options, and (e) are overwhelmed by the wide array of pain behaviors exhibited by patients. However, the clinician armed with insight into the psychological framework of chronic pain will easily be able to achieve better treatment outcomes. All clinicians involved in the management of chronic pain should be aware of some profound, yet largely ignored, psychiatric literature. The literature suggests that patients with chronic pain have a past history of abuse that is 2 to 4 times higher than the general population. In addition, it is suggested that posttraumatic stress disorder often underlies the emotional and actual physiologic changes in patients with chronic pain and other diseases.

There is a well-established relationship between physical and/or sexual abuse and both the development of chronic pain[1,2] and a poorer adjustment to pain.[1,3] A study of college students with chronic pain yielded a history of abuse in 43.5% of the females (275 subjects) and 23.8% of the males (151 subjects).[1] Unfortunately, childhood abuse proves to be a remarkably widespread problem in all socioeconomic classes surveyed in this country. In most studies, 15 to 30% of women have a reported history of sexual abuse during childhood.[4] In a cross-sectional study of 1,931 women, 22% reported a history of physical or sexual abuse during childhood or adolescence.[5] A national survey of 5,877 subjects yielded reports of childhood sexual abuse in 13.5% of women and in 2.5% of men. Although the problem is much less common in men, it is characterized by significant psychopathology in adulthood.[6]

Physical abuse during childhood is associated with the development of a variety of specific adult diseases and increased utilization of health care.[2,7,8] In addition, women who were physically or sexually abused during childhood have medical and psychological problems similar to women who are currently experiencing abuse.[5] The sexual abuse of females during childhood is particularly damaging and is highly correlated with increased physical symptoms,[4] somatization and dissociation,[9,10] substance abuse,[5,6,10] psychogenic seizures,[11–13] chronic fatigue,[14,15] posttraumatic stress disorder,[16,17] bladder dysfunction, headaches, asthma, diabetes, heart disease,[14] depression,[3] as well as other lifelong psychopathologies.[6,18] Furthermore, the greater the number of perpetrators of sexual abuse identified by each patient, the greater the number of chronic physical symptoms reported.[9]

A study of 91 outpatients with chronic pain yielded a history of abuse in 64.7% with a diagnosis of fibromyalgia, 61.9% with myofascial pain, 50.0% with facial pain, and 48.3% with other pain disorders.[19] In addition, it is suggested that sexual, physical, and emotional trauma may be important factors in the development and maintenance of fibromyalgia and associated disability in many patients.[20–22] Sexual and physical abuses during childhood have also been linked to other confusing and complex disorders, including chronic pelvic pain,[10,23,24] and chemical intolerance.[25]

The psychiatric literature strongly links childhood abuse to the development of posttraumatic stress disorder.[16,17,26] It is suggested that dissociated traumatic memories of sexual abuse may produce future psychopathology through displacement manifested by a variety of conversion symptoms or somatization, and by producing delayed posttraumatic stress disorder when current experiences elicit painful memories. Furthermore, anxiety and depression triggered by these memories often leads to alcohol and drug abuse.[27]

Coexisting disease such as anxiety or depression,[8,28] being physically or psychologically abused during adulthood,[5,8] parental alcoholism,[19] and other psychosocial problems[25] increase the likelihood and severity of somatization. In addition, patients with dysfunctional pain behaviors often have coexisting organic disease. For example, it is well known that psychogenic seizures are more common in patients who have epileptic seizures. Recently, it has also been found that patients with organic seizures as well as those with psychogenic seizures have an increased incidence of various forms of abuse. The psychosocial history may thus be important in the treatment of all patients with seizures, but particularly in those with intractable seizures.[29]

The relationship between a history of abuse and chronic pain disorders has been widely reported, but this has become a controversial topic. A review of the medical literature led some authors to conclude that existing data is insufficient to prove that victimization significantly increases the risk of chronic pain in adulthood. Criticism includes the fact that the majority of the existing studies were retrospective in nature and were thus subject to self-reporting, which may be unreliable.[30] While there may actually be only a modest link between a history of abuse and some general categories of chronic pain (headaches, back pain, unexplained pain, etc.), other criticisms are not practical or justified for the following reasons: First, any population of patients identified by a prospective study would obviously be far more likely to receive prompt psychotherapy than those patients identified retrospectively. Second, the large population of patients with common pain disorders differs greatly from the much smaller segment of patients with multiple chronic symptoms and/or dramatic pain behaviors. The body of literature previously discussed seems to support a relatively high incidence of somatization disorder, dramatic and dysfunctional behaviors, mental illness, various medical diseases, and challenging health care needs in patients with a history of abuse.[19–25] Furthermore, other literature reviews[31–33] and studies[34] support this relationship between posttraumatic stress disorder and the maintenance of chronic pain symptoms and disability.

It has been suggested that the link between somatization and childhood abuse involves a paradoxical pattern of hiding feelings and reality, while seeking acknowledgment of suffering. The same authors found that improved patient insight into the relationship between abuse and current symptoms led to decreased health care utilization.[35] The dichotomy between lifelong patterns of secrecy and the often overwhelming need for acknowledgment may thus explain many of the dysfunctional behaviors frequently exhibited by chronic pain patients. These behaviors include the relentless pursuit of validation through accumulation of (a) vast bodies of literature, (b) diagnostic tests, (c) prescriptions/medications, (d) unusual treatments, (e) "second opinions," (f) invasive procedures, and (g) various forms of "secondary gain." By recognizing these behaviors, the insightful clinician may provide the needed acknowledgment and validation (of suffering) to these challenging patients through constructive measures. Such measures include education about the aftermath of abuse, empathy regarding current symptoms, sensible medical evaluation, and

multidisciplinary treatment strategies, including referral to psychotherapy when warranted.

Physiological Aspects of Abuse and Psychogenic Disease

Another fascinating body of literature pertains to childhood abuse and brain development. Structural and physiologic changes are demonstrated in the brains of women having a history of physical abuse. Magnetic resonance imaging (MRI) findings include an abnormally prolonged T2 relaxation time in the cerebellar vermis.[36] Altered functioning of the pituitary-adrenal axis is suggested by responses to provocative challenge tests (injection of corticotrophin-releasing factor resulted in greater ACTH release and lower cortisol levels compared with controls).[37] One possible explanation for these observations comes from evidence that early childhood trauma and abuse may alter the brain by inducing neural sensitization to certain stimuli within the limbic and mesolimbic pathways, with females proving more vulnerable to sensitization than males.[25]

Localized physiologic changes may also be found in the brains of patients with psychogenic symptoms. Single photon emission computed tomography (SPECT) studies measure and compare blood flow and functional activity in specific areas of the brain. A SPECT study in men and women with unilateral hysterical sensorimotor loss showed decreased regional blood flow (and decreased activation) in the thalamus and basal ganglia contralateral to the neurologic deficit. Furthermore, the blood flow returned to normal on subsequent examination when the deficit resolved.[38] Another SPECT study documented changes in regional blood flow associated with conversion disorder manifested by displaying the dramatic wobbling gait known as astasia-abasia.[39] SPECT studies have also demonstrated changes in regional blood flow in patients with a diagnosis of fibromyalgia. These changes include decreased regional blood flow to the thalamus and other areas of the brain.[40–42] It has been suggested that decreased blood flow and functional activity in these regions of the brain may result from excessive nociceptive neural input.[40,43] A prospective study of 14 fibromyalgia patients used SPECT to measure regional blood flow before and after treatment with amitriptyline. There was a statistically significant decrease in the level of pain and in the number of trigger points. Clinical improvement was correlated with increased regional blood flow in the thalamus and basal ganglia with decreased blood flow in the temporal regions.[44] Psychological evaluations suggested that underlying depression was not responsible for these results; however, there was no control group, so determination of any placebo effect was not addressed in this particular study. Various studies thus suggest that abuse may physiologically and developmentally increase a person's susceptibility to pain and that organic changes can be associated with psychogenic disease.

Evaluation of Patients with Chronic Pain

The initial step in the examination of patients with chronic pain is to routinely inquire about any past or present abuse or trauma. Obstacles may be overcome by developing a rapport with the patient and then asking direct questions, such as "were you ever hurt or abused during childhood?", "were you ever hurt or abused as an adult?", or "are you currently afraid of anyone?" This line of questioning can be made to flow from other formal sections of the patient history including the medical, social, or family history. It may also be included in a questionnaire, but direct questioning is much more likely to yield an accurate answer. Patients rarely respond with shock. Instead, patients often benefit from a sense of relief for the opportunity to disclose this information and from empathy that is naturally received. Excellent suggestions for screening and intervention are available in an article by Rhodes and Levinson.[45] Referral to local agencies for protection and shelter must also be provided when warranted.

The next step is to observe various behaviors and key aspects of the physical examination. Certain traits and behaviors may correlate with greater psychopathology and suggest a probable history of abuse even when abuse is denied by the patient. In addition, the medical record will become much more objective if it includes (a) quoted statements from the patient, (b) observations of dramatic or dysfunctional behavior, and (c) documentation of nonanatomic features (not corresponding to known physiologic patterns) on physical examination. Inconsistencies will then become obvious through a collection of data rather than through subjective commentary. Conclusions and the choice of treatment will often become obvious as well. Much of the terminology and many specific phrases presented in this article will be very useful for incorporation into the medical record. Utilization of this information should result in a more objective and indisputable document for medical-legal testimony (ie, accident cases) as well as clinical purposes.

Behavioral Observations in Patients with Chronic Pain

The following information is drawn from 19 years of clinical practice as a neurologist with a bachelor's degree in psychology. It is intended to enable the clinician to easily recognize important personality traits and pain behaviors to develop effective and practical strategies of patient care. Furthermore, this can usually be accomplished during the initial examination and often without the involvement of psychometric testing.

Many fairly obvious characteristics and behaviors of patients with features of largely nonanatomic or psychogenic pain may logically and intuitively correlate with lesser or greater degrees of underlying psychopathology. These features may serve as reasonable predictors of both

the response to the clinician and the outcome of treatment. Furthermore, since repression and posttraumatic stress disorder may be difficult to uncover, behavioral features may provide important clues to the presence of these conditions and the need for psychotherapy. Clinicians may additionally find this "concrete" and observable data to be a vital and practical supplement to the psychological data and theory presented earlier in this paper. While admittedly anecdotal and with relatively very little literature providing practical information on this topic, there is support for the basic concept linking outcome of treatment to some characteristics of patients with somatization. The available literature suggests that these specific characteristics include the number of symptoms reported,[46] "doctor shopping",[47] repression,[48] abnormal pain behaviors,[49] mood disorders,[50,51] and willingness to participate in psychotherapy.[52] Therefore, it is conceivable that a *Somatization Behavior Scale* might be developed using this information and subjected to appropriate research.

Some general indicators of a patient having lesser psychopathology and/or better coping skills, and probably a better prognosis are as follows:

1. Exhibits insight regarding potential stressors and an interest in treatment:
   a) Willingness to discuss ongoing stresses and/or prior trauma (perhaps for the first time)
   b) Seemingly feeling better or "relieved" after venting during the examination
   c) Accepts the concept of psychosomatic illness without becoming defensive
   d) Follows through with psychotherapy and/or counseling for stress management
2. Has chosen a supportive and loving spouse/partner. This suggests a better self-esteem and a better prognosis, unless the relationship is somewhat dysfunctional and/or the spouse is codependent
3. Expresses a positive attitude toward psychotherapy/psychotherapists:
   a) Reports a history of benefiting from psychotherapy/counseling in the past
   b) Currently seeing a qualified psychiatrist or other qualified mental health professional and makes positive statements about the psychotherapist and/or results
4. Practices some stress management techniques and asserts some control over time management
5. Shows posture and movements which appear consistent with the symptoms described.
6. Has some symptoms which correlate with objective abnormalities or known anatomic patterns
7. Has seen/is seeing a reasonable number of clinicians for the current symptoms
8. Exhibits compliance with medical treatments

Characteristics and behaviors of patients that are associated with greater psychopathology and/or lesser insight, and probably a poor prognosis include the following:

1. Assumes a defensive or angry posture at the sensitively stated suggestion that stress may be contributing to symptoms (ie, "You're saying it's all in my head!")
2. Has a history of illness that is largely stress related and includes one or more of the following:
   a) Fibromyalgia syndrome
   b) Chronic fatigue syndrome
   c) Temporomandibular joint disease (TMJ disease)
   d) Frequent headaches
   e) Depression
   f) Severe anxiety disorder
   g) Panic attacks
   h) Chronic insomnia
   i) Irritable bowel syndrome
   j) Severe eating disorder
   k) Multiple drug "allergies" and "bad reactions," or chemical intolerances
3. Uses terms of endearment and abbreviations to report diseases including:
   a) "My Fibro" (Fibromyalgia)
   b) "My CFS" (Chronic fatigue syndrome)
   c) "My TMJ" (Temporomandibular joint disease)
4. Reports a large array of symptoms
   a) Count and record the actual number of symptoms
   b) Describe the format and record the number of pages when the patient brings a meticulously prepared list
5. Focuses upon symptoms excessively or dramatically:
   a) Symptoms may be reported relentlessly throughout the examination. The mission of reporting all symptoms and/or details of the medical history may cause the patient to be distracted to the point of failing to listen to the examiner. This becomes obvious when a patient asks questions, but does not listen to answers given by the clinician (as the patient is pondering another group of past or present symptoms).
   b) Dramatic terms and examples are used to describe symptoms (ie, "hot, jabbing pokers")
   c) Compulsive use of a diary, calendar, or printed catalog
   d) Symptoms documented through elaborate pain drawings or diagrams
6. Makes frequent reference to radiographic and any other abnormal test results (as if trophies)

7. Chronic malcompliance and/or paradoxically avoids relatively simple treatments for common diseases such as carpal tunnel syndrome, migraines, or chronic depression
8. Relentlessly pursues and collects information to document disease, in the form of:
   a) Medical opinions
   b) Test results
   c) Literature including internet information
9. Has secondary gain including any of the following:
   a) Chronic dependence (dependent personality)
   b) Attention from any person
   c) Pending litigation and possible financial reward
   d) Freedom from responsibilities
   e) Application for disability, particularly if a disability form is presented for completion at the end of the first visit, but "You were highly recommended!"
10. Has no spouse/significant other or one who is either apathetic or highly codependent
11. Expresses criticism or anger toward one or more other clinicians
12. Has a history of substance abuse, dependence, or addiction involving:
    a) Alcohol
    b) Prescription drugs
    c) Illicit drugs
    d) Tobacco
13. Drug-seeking behavior:
    a) Patient or spouse request a specific narcotic or muscle relaxant medication
    b) Patient is receptive to treatment with narcotics, but not to other treatments because "nothing else works"
14. Omits important medical information (suggesting denial or defensiveness):
    a) Informs clinician after the examination or even on a subsequent visit that he or she is already taking an antidepressant, anxiolytic, or narcotic medication
    b) Requires interrogation to obtain pertinent medical history
    c) Passively fails to provide prior medical records (ie, forgets the name of last doctor seen, or simply forgets to bring important test results)
    d) Refuses access to prior medical records (ie, will not disclose the name of last doctor seen, or blatantly refuses to sign a form for medical release of information)
15. Describes "bad experiences" with one or more psychotherapists in the past. This may require some persistence, but the patient should be encouraged to describe the prior experience(s) in detail. The exercise is often very revealing of other psychosocial problems that will not otherwise be discovered and documented (ie, two nervous breakdowns, one occurring after a son committed suicide). Important information may elude you unless this history is adequately explored.
16. Has an aversion to physical activity manifested by exacerbation of symptoms during physical or massage therapy and/or chronic avoidance of any regular exercise
17. Has history of prior hospitalization(s) with negative workup (ie, for chest pain)
18. Reports history of multiple drug "allergies" and/or consistently "bad" treatment outcomes
19. Has history of being abused during childhood and or adulthood
20. Has members of immediate family with history of mental illness, alcoholism, and/or being abused
21. Exhibits nonanatomic features on neurologic examination. Nonanatomic features are those which do not conform to normal physiologic principles or pathways. Such features are very common manifestations of psychogenic diseases. Somatization disorder and conversion disorder are generally mediated more "subconsciously" and are considered manifestations of underlying psychopathology. In contrast, symptom magnification and malingering are typically regarded as being more "conscious" and are associated with deception for secondary gain of any form (ie, money, freedom from responsibility, or attention).

Nonanatomic features may serve as the only initial clue and are often the most decisive clue regarding the presence of psychogenic disease. The following behavioral manifestations and findings on physical examination are very highly correlated with both the presence and severity of psychogenic disease:

1. Sensory examination reveals any or all of the following nonanatomic features:
   a) Splitting the midline
   b) Nondermatomal sensory loss
   c) Inconsistent responses throughout the examination or during repeated examinations
   d) Relentlessly vague and uncommitted responses (ie, "it sort of feels sharp" or "not very sharp")
2. Musculoskeletal features include any or all of the following:
   a) Spontaneous movements performed better than those during formal testing (ie, while dressing or while leaving the office)
   b) Dramatic expressions of pain to even light palpation in areas of the body
   c) Any other inconsistent behaviors which are observed and documented

4. Motor examination reveals any or all of the following nonanatomic features:
   a) Simultaneous contraction of antagonistic muscles (ie, biceps-triceps)
   b) Weakness in part(s) of the body that should not be affected by an illness (ie, the patient displays arm weakness in addition to leg weakness after a low back injury)
   c) Weak and inconsistent effort. Certain tests are vital to the examination, easily performed, and with results that are usually very obvious. A "positive" result indicates nonanatomic behavior and weak effort. It is remarkable that patients prone to somatization or symptom magnification often exhibit the following signs even without any complaints of leg weakness or evidence of leg weakness in the remainder of the physical examination!

The following three tests of motor function are all performed with the patient in a supine position, while the examiner stands at the foot of the examination table. One leg is examined at a time. A positive test generally indicates poor effort:

Hoover's sign. Place one hand over the ankle of the weak leg and the other hand (surreptitiously) under the ankle of the strong leg. Then ask patient to raise "weak" leg with knee extended (active straight leg raise), a task that is normally accomplished by pushing down with the other "strong" leg. The test is positive if the patient exhibits a lack of downward pressure against the table with the strong leg. This is best considered a test of weakness in one leg (as Hoover's sign may be present bilaterally if both legs are genuinely weak).

Reverse Hoover's sign. The positioning is the same as above. The patient exhibits little or no force when asked to produce downward pressure against the bed with the weak leg. The test is positive if the "weak" leg then shows much more downward pressure when the patient is asked to lift the other "strong" leg.

Leg flexion-extension test. This is a test developed by the author and believed to be the single most useful, obvious, common feature of the nonanatomic examination. One leg is placed in a position with the hip and the knee each flexed at about 90°. The examiner uses a hand to hold the patient's elevated foot. The patient is then asked to straighten the leg, horizontally pushing the hand of the examiner away. The test is positive (in one leg or both legs) when the patient generates little or no force, yet the patient is able to stand unassisted. The dramatic nature of this may be documented by stating (or documenting on video camera, when a plaintiff's attorney has hired a videographer) "the patient generated a force that was overcome with one finger, but the patient can stand and walk".

Management of "Challenging" Patients

Patients with multiple characteristics of greater psychopathology may become a great burden to the clinician and the office staff. Some may even become hostile. The following behaviors may be observed:

1. Demanding excessive attention. The patient or spouse may assault your office with repeated phone calls or may show up in your office without an appointment. Alternatively, and more dramatically, the patient may go to the emergency room unnecessarily. The patient is seeking validation of physical suffering. Usually the patient is also trying to convince the clinician that the symptoms are severe enough to warrant more tests and/or more medication.
2. Malcompliance with carefully planned and discussed treatment.
3. Anger and false accusations about "mistreatment." For this reason, always have a chaperone even if the patient brought a spouse or friend.
4. Relentless pursuit of muscle relaxants or narcotics (ie, drug-seeking behavior).
5. Convincing you to order or perform invasive tests or procedures after other evaluations yield no diagnosis. Thereafter, imagined side effects or actual complications may occur. The clinician is seen as the perpetrator of the procedure, becomes responsible for many additional symptoms, and remains "joined" to this patient. This may explain why some surgeons often give unwarranted and extraordinarily generous disability and impairment "rewards" to histrionic patients who are unhappy with the outcome of an operation. Perhaps this is given as a remedy to appease a dissatisfied customer and to avoid potential litigation. However, the unwarranted legitimization of disease could ultimately strengthen an unfounded lawsuit from a patient rendered "totally disabled."

If you are a clinician seeing a new patient or already treating a patient having evidence of significant underlying psychopathology, challenges may arise at any time. If you have decided to begin or continue treatment, then the following is strongly recommended:

1. Be empathetic.
2. When a patient has a large array of symptoms, begin the interview with questions that address the "big picture" rather than getting inundated with each symptom. Examples of such questions are "How do these problems affect you?" or "How can I help you today?" This will encourage the patient to focus on any important issues that may be addressed within a reasonable amount of time. Consequently, the pa-

tient will likely be more satisfied at the end of the examination, and the examiner will be less exhausted.
3. Refer the patient for psychotherapy.
4. Establish realistic expectations for goals of treatment.
5. Insist upon compliance.
6. Appropriately compartmentalize treatment among health care providers/specialists to avoid any conflicting treatments and overmedication.
7. Try to discourage passive and dependent behaviors. Encourage the patient to take a more active and positive role in decisions about health. Try to gradually restrict the role of any controlling and/or codependent spouse or other parties.
8. Perform a thorough examination and evaluation, but avoid any unnecessary tests that will probably only confuse the situation.
9. Avoid invasive diagnostic and therapeutic procedures unless clearly necessary. Invasive medical procedures should be approached with caution in patients recognized to have a strong tendency to magnify symptoms and/or who are obviously depressed. Such patients often have unrealistic expectations of feeling wonderful after a procedure, often complain of "complications," may respond only temporarily to treatment, and may become very upset or angry. It behooves the clinician to carefully screen patients and to clearly discuss (and document) the indications and realistic expectations of surgery or other procedures. Psychological evaluation and treatment of such patients will help identify factors which may influence outcomes, determine a patient's appropriateness for such procedures, and reduce liability.
10. Patients taking narcotics or other habit-forming medications on a long term basis will require special management. One option is to consider temporarily continuing narcotics and other habit-forming medications until other treatment is effective; it may be unrealistic to try to abruptly discontinue medications that were chosen and chronically provided by another physician. Another option, particularly when existing treatment seems inappropriate and/or drug-seeking behavior is obvious, is to make it clear that only new treatment will be administered; this will promptly cause you to "lose" patients who are not sincerely interested in proper management.
11. Try to achieve the above objectives at the time of the initial examination or immediately following your review of any necessary tests being performed.

Occasionally it will be logical to avoid or terminate a patient-clinician relationship. This determination may depend upon the specialty and expertise of the clinician, characteristics of the patient (ie, drug seeking), and perceived therapeutic potential. The following approach is recommended in these circumstances:

1. Be genuinely empathetic but do not prescribe medications as this will perpetuate the relationship.
2. Smile and remain friendly. You can still make this a pleasant experience. Do not allow yourself to appear overly uncomfortable as this may be misinterpreted and taken personally by the patient, particularly those who are sensitive to rejection.
3. Assure the patient that the pain is "real" (because it is) and that there is no need to prove it to anyone.
4. Recognize the medical knowledge and experience displayed by the patient and any spouse/companion. Demonstrate that you have some understanding of the patient's frustrations and that you have reviewed pertinent medical records. You may find it appropriate to indicate that your knowledge will never be as great as theirs or as great as other clinicians who have had the experience of treating the patient. This is followed by making the recommendation that the patient remain under the care of the current physician(s) or go to a university/tertiary care center for comprehensive evaluation where even greater expertise may be offered.
5. Be clear and concise in your communication and exit the room. Do not "waffle."
6. If you decide not to accept a new patient based upon review of medical records at the time of the initial visit, then communicate this upon entering the examination room, defer the physical examination, and do not charge a fee (even if a lot of time was spent reviewing records).
7. If a "difficult" or seemingly litigious patient registers a complaint, ask for a detailed letter to be included in the medical record. The patient will usually respond with enthusiasm and then will likely produce a document (or dissertation) that attests to even greater instability and psychopathology than anticipated.

Multidisciplinary Treatment Options For Chronic Pain

Patients with chronic pain should be evaluated and treated with multidisciplinary approaches for any associated medical or psychological pathology. When used properly, all of the following treatments generally have validity and efficacy in treating various disorders:

1. Stress management and relaxation training
   a) Exercise
   b) Meditation
   c) Psychotherapy including counseling and medication
   d) Biofeedback
2. Natural/holistic treatment

a) Physical therapy specific to the needs of the patient
b) Massage therapy
c) Manual therapy and/or manipulation
d) Supplements (B-complex vitamins, flaxseed oil, DL-phenylalanine & many others)
e) Acupuncture

3. Medications
a) Anticonvulsants
b) Antidepressants (particularly tricyclic antidepressants and duloxetire)
c) Analgesics including nonsteroidal anti-inflammatory medications
d) Narcotics only when clearly indicated; after trying the above choices, prescribed on a schedule rather than "as needed," and ideally, on a temporary basis
e) Muscle relaxants for chronic spasticity or for acute (temporary) injury/strain

4. Injections and instrumentation. These are indicated only for specific anatomic diseases. The more invasive procedures should only be considered for patients without significant features of psychosomatic illness.
a) Trigger point injections (occasionally, not repeatedly)
b) Epidural injection
c) Spinal cord stimulator or medication pump (considered a last resort since these may be associated with infection and other problems, but are appropriate options for some patients)

5. Identify and treat any underlying pathology that may be addressed medically, surgically or through psychotherapy.

Psychotherapy for Chronic Pain

Psychotherapy is commonly offered to patients with chronic pain to improve coping skills and to decrease emotional distress. Psychological intervention becomes essential when symptoms are unusual or excessive and/or when unresolved or repressed trauma is strongly suspected. This enables identification and treatment of underlying psychopathology including posttraumatic stress disorder, depression, anxiety, repressed emotions, fear, guilt, and any psychosocial problems which are likely perpetuating the symptoms and disability. Since it has been shown that improved patient insight regarding the relationship between abuse and current symptoms results in decreased health care utilization,[35] clinicians who can effectively communicate with patients and identify psychological issues will almost certainly be able to provide better treatment and outcomes.

Recent literature indicates that depression dramatically increases the severity of symptoms and disability in patients with posttraumatic stress disorder.[32] In addition, comorbid depression is proven to have significant effects upon physiologic factors, including sleep architecture and brain chemistry in patients with posttraumatic stress disorder. Since these patients with comorbid disease differ so profoundly from those with either disorder alone (ie, the whole is greater than the sum of its parts), one author suggests that treatment strategies need to be developed for a new psychobiological condition identified as "posttraumatic mood disorder."[53] A recent study also examined outcomes of outpatient psychotherapy in women with depression and/or anxiety disorders. Patients with a prior history of childhood sexual abuse were found to have a much poorer response to treatment (mental health and function) compared with those without a history of abuse. Implications regarding improvement of treatment are also discussed.[54]

Successful treatment of chronic posttraumatic stress disorder usually involves a combination of medication and psychotherapy. Antidepressants are the most commonly used medications. Anticonvulsants are often used for the treatment of mood disorders and are also widely used in the management of chronic pain. Some patients with refractory symptoms or psychotic features are being treated with atypical psychotic medications.[55] Psychological treatment usually involves cognitive and behavioral approaches.[56] Those with the best outcomes include cognitive processing therapy[57] and Eye Movement Desensitization and Reprocessing (EMDR).[58,59] Psychotherapy may uncover repressed memories and emotions, and may provide vital insight regarding the relationship between prior trauma and current symptoms. The role of repression is actually controversial,[60] and it has been suggested that anxiety may be a more significant factor in morbidity, and as a target for treatment.[61] On the other hand, repression is inherently elusive and its role may be easily underestimated. It is therefore quite likely that repression and posttraumatic stress disorder are under diagnosed, but may be recognized through behavioral manifestations, and then confirmed through proper inquiry and psychotherapy.

Other multidisciplinary approaches, such as stress management, natural and holistic care, and a variety of medications are strongly recommended for the treatment of chronic pain. Considering the prevalence of underlying psychopathology, the use of potentially habit-forming medications and invasive procedures should only be considered when the diagnosis and indications are relatively clear, and following appropriate screening.

Clinicians need clear guidelines for diagnosing, treating and communicating with patients suffering from these psychosomatic disorders. However, the management of patients with chronic pain that is mainly rooted in the prior experiences of trauma and abuse is only now being aggressively studied. More research is warranted to compare the characteristics of patients with posttraumatic stress disorder arising from abuse to those with a history of acute trauma or military combat. It seems obvious that an environment of abuse would more likely involve repeated trauma, psychosocial challenges, and a family history of mental illness.

Building Rapport and Trust

Countless times I have heard patients say, "You think it's in my head!" Such defensiveness can be decreased by anticipating this response and by trying to become the patient's ally rather than adversary. This is accomplished by providing empathy, validation, and sincere acknowledgment that symptoms are real. The patient's need to focus upon and report all symptoms is thereby reduced, thus enabling the patient to ultimately gain insight into what the symptoms actually represent. Even longstanding defensiveness may be overcome and the vast majority of patients can be successfully directed to pursue psychotherapy. The clinician's attitude and sincere belief in a treatment regimen actually has a great impact upon compliance by the patient. It is very helpful to explain concepts of disease using some or all of these examples:

1. Stress exacerbates all medical illnesses including tremors, headaches, arthritis, and even heart disease.
2. An abnormal test is not necessary to document pain. Facial pain and migraine headaches are regularly diagnosed clinically and without the benefit of an abnormal MRI of the brain. Some patients with organic disease may magnify symptoms and display nonanatomic features on physical examination to seek validation and override the stigma of negative tests; repeating the neurologic examination after such a discussion may result in a more "anatomic," and less confusing, examination.
3. A multidisciplinary approach is necessary because other measures have failed or may not be adequate. This approach includes exploration and treatment of psychological as well as medical aspects of disease. The necessary medical tests will be performed first, and then a comprehensive treatment plan will be discussed at the next visit.
4. Severe abuse or trauma during childhood, in particular, may change brain development and chemistry in a way that may permanently alter pain thresholds and responses. Even those patients who are resistant to the notion that stress is significantly contributing to symptoms usually embrace this concept, presumably because it provides the needed authenticity and validation.

Discussion

Pain is subjective and deeply influenced by emotional factors, but it is real. Treatment of patients with chronic pain (and other symptoms) is particularly challenging when it is associated with significant psychogenic disease or nonanatomic features. These patients are usually (but not always) women who have an increased incidence of being abused during childhood, adulthood, or both. Consequently, many such patients generally develop significant psychopathology and exhibit constellations of dysfunctional pain behaviors including excessive somatization. Such behaviors may emerge as patients seek attention and validation, while paradoxically repressing traumatic memories and emotions. Patients with more severe or frequent abuse, usually during childhood and particularly if sexual in nature, often develop specific syndromes or combinations of syndromes. The syndromes include posttraumatic stress disorder, fibromyalgia, and other conditions characterized by excessive somatization and increased utilization of health care. Such patients may be able to overcome some of the complex psychological frameworks that perpetuate chronic pain symptoms, if given the opportunity to discuss "hidden" emotions and to gain insight.

Special circumstances may arise following an accident or, occasionally, following an invasive medical procedure. This is because patients with a history of being abused often have exaggerated physical and emotional responses to trauma, particularly when a sudden event yields new access to health care. Thus, patients formerly ignoring or repressing symptoms may suddenly recognize and report an unusual array of symptoms that seemingly developed after an injury. A likely explanation is that acute stress or injury may rekindle painful memories and emotions related to prior trauma.

The Joint Commission on Accreditation of Health Care Organizations (JCAHCO) identified pain as "the fifth vital sign" in January of 2001, and caregivers are required to regularly assess (using pain scales), document, and treat pain. The U.S. Congress has also declared the present decade as "The Decade of Pain Control and Research." However, the commonly used unidimensional pain scales measure predominantly emotional conditions (ie, anxiety and depression) rather than the actual pain characteristics. These scales yield patient scores which are regarded as poor indicators of analgesic requirement, and improved methodology is strongly recommended.[62] Consequently, the treatment is often misdirected as clinicians are treating patients with analgesics rather than addressing the emotional factors actually being measured. The practice of reducing patients' pain scores may thus result in dangerous levels of sedation.[63] It follows that the risk of complications including overdose or drug dependence must be substantially increased in patients with any underlying (and often unrecognized) psychopathology.

Profound mind-body relationships are underscored by imaging and physiologic studies documenting changes in the brain of women having a history of being abused. In addition, changes in regional blood flow in the brain are documented by PET scans which correlate anatomically with the physical deficits exhibited by men and women with conversion disorder and with the clinical response to treatment in women with a diagnosis of fibromyalgia. This information suggests that severe emotional or physical trauma may alter brain physiology and development to produce specific syndromes characterized by a combination of organic and psychosomatic disease. It seems that a more accurate term for psychosomatic

disease is *psychophysiological* disease. Furthermore, many *medical* illnesses are found to be more common in this group of patients.

Much research is needed to better understand the psychophysiology of pain, to find the most effective medical and psychological treatments for pain, and to provide clinicians with practical screening tools for evaluating the unfortunate and often challenging patients with chronic pain. Specific topics for future research might include: (a) retrospective and prospective studies of the effectiveness of specific therapeutic interventions for various pain syndromes, (b) studies of diagnosis and treatment outcomes correlated with increasingly sophisticated imaging and physiologic techniques, (c) evaluation and possible improvement of existing pain scales and psychological screening methods, and (d) investigations to determine whether some of the observable patient characteristics or behavioral patterns discussed in this paper may be configured into a validated and clinically useful *Somatization Behavior Scale*. It is conceivable that a *Multidimensional Pain and Behavior Scale* could then be developed for practical use as a diagnostic tool in many clinical settings and with the opportunity for better treatment outcomes.

The psychological and physiologic etiologies of chronic pain are certain to remain controversial. However, there is sufficient evidence (and experience) to support the following approach to the patient with chronic pain: (1) clinicians should routinely ask about any history of past or present abuse, (2) chronic pain should be treated as real and managed with empathy, validation of pain and suffering, and multidisciplinary approaches, (3) observation of dysfunctional pain behaviors and documentation of key features on the physical examination may provide evidence of significant psychopathology, (4) invasive procedures and habit forming medications should be employed with caution, and (5) psychological evaluation and counseling should always be considered, but become essential when symptoms are excessive and/or when a history of significant psychophysiological trauma is either identified or strongly suspected. This approach is relatively simple, practical, and may be effective in all primary care or specialty settings. An initial output of time and energy is necessary, but this is usually not excessive, and the long term rewards are many.

References

1. Fillingim RB, Wilkinson CS, Powell T. Self-reported abuse history and pain complaints among young adults. *Clin J Pain.* 1999;15:75–76.
2. Finestone HM, Stenn P, Davies F, et al. Chronic pain and health care utilization in women with a history of childhood sexual abuse. *Child Abuse Negl.* 2001;25:1133-1136.
3. Zlot SI, Herrmann M, Hofer-Mayer T, Adler M, Adler RH. Childhood experiences and adult behavior in a group of women with pain accounted for by psychological factors and a group recovered from major depression. *Int J Psychiatry Med* 2000;30 (3):261–75.
4. Roberts SJ. The sequelae of childhood sexual abuse: a primary care focus for adult female survivors. *Nurse Pract* 1996;21:42, 45, 49–52.
5. McCauley J, Kern DE, Kolodner K, et al. Clinical characteristics of women with a history of childhood abuse: unhealed wounds. *JAMA.* 1997;277:1362–1368.
6. Molnar BE, Buka SL, Kessler RC. Child sexual abuse and subsequent psychopathology: results from the National Comorbidity Survey. *Am J Public Health.* 2001;91:753–760.
7. Farley M, Patsalides BM. Physical symptoms, posttraumatic stress disorder, and healthcare utilization of women with and without childhood physical and sexual abuse. *Psychol Rep.* 2001;89:595–606.
8. Katon W, Sullivan M, Walker E. Medical symptoms without identified pathology: relationship to psychiatric disorders, childhood and adult trauma, and personality traits. *Ann Intern Med* 2001;134:917–925.
9. Farley M, Keaney JC. Physical symptoms, somatization, and dissociation in women survivors of childhood sexual assault. *Women Health* 1997;25:33–45.
10. Badura AS, Reiter RC, Altmaier EM, Rhomberg A, Elas D. Dissociation, somatization, substance abuse, and coping in women with chronic pelvic pain. *Obstet Gynecol.* 1997;90:405–410.
11. Bowman ES, Markan ON. Psychodynamics and psychiatric diagnoses of pseudoseizure subjects. *Am J Psychiatry.* 1996;153:57–63.
12. Wyllie E, Glazer JP, Benbadis S, et al. Psychiatric features of children and adolescents with pseudoseizures. *Arch Pediatr Adolesc Med.* 1999; 153:244–248.
13. Abubakr A, Kablinger A, Caldito G. Psychogenic seizures: clinical features and psychological analysis. *Epilepsy Behav.* 2003;4:241–245.
14. Romans S, Belaise C, Martin J, et al. Childhood abuse and later medical disorders in women. An epidemiological study. *Psychother Psychosom* 2002;71:141–150.
15. Taylor RR, Jason LA. Chronic fatigue, abuse-related traumatization, and psychiatric disorders in a community-based sample. *Soc Sci Med.* 2002; 55:247–256.
16. Zlotnick, Zakriski AL, Shea MT, Costello E, et al. The long-term sequelae of sexual abuse: support for a complex posttraumatic stress disorder. *J Trauma Stress* 1996;9:195–205.
17. Elhai JD, Frueh BC, Gold PB, et al. Clinical presentations of posttraumatic stress disorder across trauma populations: a comparison of MMPI-2 profiles of combat veterans and adult survivors of child sexual abuse. *J Nerv Men Dis.* 2000;188:708–713.
18. MacMillan HL, Fleming JE, Streiner DL, et al. Childhood abuse and lifetime psychopathology in a community sample. *Am J Psychiatry.* 2001;158:1878–1883.
19. Goldberg RT, Pachas WN, Keith D. Relationship between traumatic events in childhood and chronic pain. *Disabil Rehabil.* 1999;21:23–30.
20. Walker EA, Keegan D, Gardner, et al. Psychosocial factors in fibromyalgia compared with rheumatoid arthritis: II, Sexual, physical, and emotional abuse and neglect. *Psychosom Med* 1997;59:572–577.
21. Winfield JB. Pain in fibromyalgia. *Rheum Dis Clin North Am.* 1999;21: 55–79.
22. Winfield JB. Psychological determinants of fibromyalgia and related syndromes. *Curr Rev Pain* 2000;4:276–286.
23. Walker EA, Katon WJ, Hansom J, et al. Psychiatric diagnoses and sexual victimization in women with chronic pelvic pain. *Psychosomatics* 1995;36:531–540.
24. Ehlert U, Heim C, Hellhammer DH. Chronic pelvic pain as a somatoform disorder. *Psychother Psychosom* 1999;68:87–94.
25. Bell IR, Baldwin CM, Russek LG, et al. Early life stress, negative paternal relationships, and chemical intolerance in middle-aged women: support for a neural sensitization model. *J Womens Health.* 1998;7: 1135–47.
26. Yehud R, Hallig SL, Grossman R. Childhood trauma and risk for PTSD:

relationship to intergenerational effects of trauma, parental PTSD, and cortisol excretion. *Dev Psychopathol* 2001;13:733–753.

27. Green AH. Comparing child victims and adult survivors: clues to the pathogenesis of child sexual abuse. *J Am Acad Psychoanal.* 1995;23: 655–670.
28. Newman MG, Clayton L, Zuellig A, et al. The relationship of childhood sexual abuse and depression with somatic symptoms and medical utilization. *Psychol Med.* 2000;30:1063–1077.
29. Rosenberg HJ, Rosenberg SD, Williamson PD, et al. A comparative study of trauma and posttraumatic stress disorder prevalence in epilepsy patients and psychogenic nonepileptic seizure patients. *Epilepsia* 2000; 41:447–452.
30. Raphael KG, Chandler HK, Ciccone DS. Is childhood abuse a risk factor for chronic pain in adulthood? *Curr Pain Headache Rep.* 2004;8:99–110.
31. Otis JD, Keane YM, Kerns RD. An examination of the relationship between chronic pain and post-traumatic stress disorder. *J Rehabil Res Dev* 2003;40:397–405.
32. Roy-Byrne P, Smith WR, Goldberg J, et al. Post-traumatic stress disorder among patients with chronic pain and chronic fatigue. *Psychol Med.* 2004;34:363–368.
33. Sharp TJ. The prevalence of post-traumatic stress disorder in chronic pain patients. *Curr Pain Headache Rep.* 2004;8:111–115.
34. De Leeuw R, Bertoli E, Schmidt JE, Carlson CR. *J Oral Maxillofac Surg* 2005;63:42–50.
35. Morse DS, Suchman AL, Frankel RM. The meaning of symptoms in 10 women with somatization disorder and a history of childhood abuse. *Arch Fam Med* 1997;6:468–76.
36. Anderson CM, Teicher MH, Polcari A, Renshaw PF. Abnormal T2 relaxation time in the cerebellar vermis of adults sexually abused in childhood: potential role of the vermis in stress-enhanced risk for drug abuse. *Psychoneuroendocrinology* 2002;27:231–44.
37. Heim C, Newport DJ, Bonsall R, et al. Altered pituitary-adrenal axis responses to provocative challenge tests in adult survivors of childhood abuse. *Am J Psychiatry.* 2001;158:575–581.
38. Vuilleumier P, Chicherio C, Assal F, Schwartz S, Slosman D, Landis T. Functional neuroanatomical correlates of hysterical sensorimotor loss. *Brain.* 2001;124:1077–1090.
39. Yazici KM, Kostakoglu L. Cerebral blood flow changes in patients with conversion disorder. *Psychiatry Res.* 1998;83:163–168.
40. Mountz JM, Bradley LA, Modell JG, et al. Fibromyalgia in Women: Abnormalities of regional cerebral blood flow in the thalamus and the caudate nucleus are associated with low pain threshold levels. *Arthritis Rheum* 1995;38:926–938.
41. Johansson G, Risberg J, Rosenhall U, et al. Cerebral dysfunction in fibromyalgia: Evidence from regional cerebral blood flow measurements, otoneurological tests and cerebrospinal fluid analysis. *Acta Psychiatr Scand* 1995;91:86–94.
42. Kwiatek R, Barnden L, Tedman R, et al. Regional cerebral blood flow in fibromyalgia: Single-photon-emission computed tomography evidence of reduction in the pontine tegmentum and thalami. *Arthritis Rheum* 2000;43:2823–2833.
43. Mountz JM, Bradley LA, Alarcon GS. Abnormal functional activity of the central nervous system in fibromyalgia syndrome. *Am J Med Sci* 1998;315:405–412.
44. Adiguzel O, Kaptanoglu E, Turgut B, Nacitarha V. The Possible Effect of Clinical Recovery on Regional Cerebral Blood Flow Deficits in Fibromyalgia: A Prospective Study with Semiquantitative SPECT. *Southern Med J.* 2004;97:651–655.
45. Rhodes KV, Levinson W. Interventions for intimate partner violence against women. *JAMA* 2003;289:601–605.
46. Graver V, Ljunggren AE, Malt UF, et al. Can psychological traits predict the outcome of lumbar disc surgery when anamnestic and physiological risk factors are controlled for? Results of a prospective cohort study. *J Psychosom Res.* 1995;39:465–476.
47. Nickel R, Egle UT, Rompe J, et al. Somatization predicts the outcome of treatment in patients with low back pain. *J Bone Joint Surg Br.* 2002; 84:189–195.
48. Schwartz RA, Greene CS, Laskin DM. Personality characteristics of patients with myofascial pain-dysfunction (MPD) syndrome unresponsive to conventional therapy. *J Dent Res.* 1979;58:1439–1439.
49. Ensalada LH. The importance of illness behavior in disability management. *Occup Med* 2000;15:739–754.
50. Junge A, Dvorak J, Ahrens S. Predictors of bad and good outcomes of lumbar disc surgery. A prospective clinical study with recommendations for screening to avoid bad outcomes. *Spine.* 1995;20:460–468.
51. McLeod CC, Budd MA, McClelland DC. Treatment of somatization in primary care. *Gen Hosp Psychiatry.* 1997;19:251–258.
52. Kashner TM, Rost K, Cohen B, et al. Enhancing the health of somatization disorder patients. Effectiveness of short-term group therapy. *Psychosomatics* 1995;36:462–470.
53. Sher L. The concept of post-traumatic mood disorder. *Med Hypotheses* 2005;65 :205–210.
54. Peleikis DE, Mykletun A, Dahl AA. Current mental health in women with childhood sexual abuse who had outpatient psychotherapy. *Eur Psychiatr.* 2005;20:260–267.
55. Hammer MB, Robert S. Emerging roles for atypical antipsychotics in chronic post-traumatic stress disorder. *Expert Rev Neurother.* 2005;5: 267–275.
56. Solomon SD, Johnson DM. Psychosocial treatment of posttraumatic stress disorder: a practice-friendly review of outcome research. *L Clin Psychol.* 2002;58:947–959.
57. Nishith P, Nixon RD, Resick PA. Resolution of trauma-related guilt following treatment of PTSD in female rape victims: A result of cognitive processing therapy. *J Affect Disord.* 2005;86:259–265.
58. Stickgold R. EMDR: a putative neurobiological mechanism of action. *J Clin Psychol.* 2002;58:61–75.
59. Solomon EP, Heide KM. The biology of trauma: implications for treatment. *J Interpers Violence.* 2005;20:51–60.
60. Goodman GS, Ghetti S, Quas JA, et al. A prospective study of memory for child sexual abuse: new findings relevant to repressed memory controversy, *Psychol Sci.* 2003;14:113–118.
61. Paylo SA, Beck JG. Is the concept of "repression" useful for understanding chronic PTSD? *Behav Res Ther.* 2005;43:55–68.
62. Clark WC, Yang JC, Tsui SL, et al. Unidimensional pain rating scales: a multidimensional affect and pain survey (MAPS) analysis of what they measure. *Pain.* 2002;98:241–247.
63. Taylor S, Voytovich AE, Kozol RA. Has the pendulum swung too far in postoperative pain control? *Am J Surg.* 2003;186:472–475

Please see Søren Ventegodt and Joav Merrick's editorial on page 1063 of this issue.