

# An Approach to Work-Related Disorders of the Upper Extremity

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## Abstract

*Management of work-related musculoskeletal disorders has been frustrating for the orthopaedist. The so-called cumulative-trauma disorders have few objective findings, and patients often do not respond to well-established orthopaedic treatments, both nonsurgical and surgical. In some areas of the country the rate of reimbursement is low; that factor, combined with the excessive paperwork and the legal burden, discourages many orthopaedists from treating patients with these conditions. However, the incidence and cost of work-related disorders continue to increase, and the orthopaedic community is being called on to help understand their etiology and to attempt to control the "epidemic" that has significantly affected the survival of certain industries. The authors review the current orthopaedic and occupational medicine literature and suggest a management approach that has been found effective in reducing both costs and disability due to these disorders.*

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The annual incidence of work-related cumulative-trauma and soft-tissue disorders has increased markedly over the past decade.<sup>1,2</sup> The "epidemic" of so-called repetitive-strain injuries and cumulative-trauma disorders was first noted in Australia 15 years ago<sup>3-6</sup> and then emerged in many of the industrialized countries.<sup>3</sup> According to the US Bureau of Labor Statistics, cumulative-trauma disorders have accounted for more than 60% of all occupational illnesses reported in the United States since 1991.<sup>7</sup>

The resultant costs of these conditions are between \$60 billion and \$100 billion a year and are thought to affect the very survival of certain industries.<sup>8-12</sup> According to an insurance company analysis, the average cost related to an upper-extremity cumulative-trauma disorder in 1989

was \$8,070—almost twice the average workers' compensation claim of \$4,075.<sup>13</sup> This analysis also found that 25% of the cases accounted for 89% of the costs. Medical expenses were paid for only 49.9% of cases, which indicates that half of the patients had lost no time from work. In contrast, when all work-related injuries were evaluated together, 73.9% of patients had no lost time. This illustrates the significantly longer disability associated with cumulative-trauma disorders.

## Etiology of Work-Related Disorders

The etiology of work-related disorders remains controversial.<sup>4,14</sup> Some believe that exposure to repetitive forces, such as vibration, or abnor-

mal positioning of the hand and wrist are responsible for many of these conditions. Silverstein et al<sup>15,16</sup> demonstrated that persons in high-force, high-repetition jobs had a 29% higher annual incidence of tendinitis than those in low-repetition, low-force jobs. Other studies support the hypothesis that repetition and force over a prolonged period of time result in microtears, inflammation, and degeneration of tendons and ligaments and possibly synovial tissue and muscle.<sup>17-22</sup> For example, it has been shown that carpal tunnel pressure can increase from 3 to 30 mm Hg when the wrist is placed in extreme positions or when there is repeated hand or wrist motion.<sup>23-25</sup>

Those who disagree with these theories challenge them for a number of reasons. Cumulative-trauma disorders usually present with no objective findings to substantiate the

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patient's complaints. The history of aching, discomfort, muscle weakness, and vague numbness is entirely subjective. The patient may report hand swelling, but it often cannot be confirmed on physical examination. Similarly, the physical examination usually demonstrates areas of tenderness, weakness of grip, and vague nonanatomic sensory loss, which are also completely subjective. Moreover, patients with work-related disorders frequently do not respond to well-established treatment methods, and their symptoms commonly persist.<sup>5,26,27</sup>

Other causes that have been proposed to explain the persistent upper extremity pain and prolonged disability include abnormality of the cervical nerves within the neck and thoracic outlet syndrome, which can cause vague, aching discomfort and pain.<sup>28,29</sup> Mackinnon and Novak<sup>29</sup> have reported that in many cases peripheral symptoms occur without proximal symptoms. If pain, rather than numbness, is the predominant complaint, the diagnosis is even more difficult. Provocative tests for thoracic outlet syndrome and brachial-plexus tension tests will sometimes reproduce the patient's peripheral pain, confirming the diagnosis.<sup>30</sup> In other cases, however, both the history and the physical examination findings are vague, and the diagnosis is more difficult, if not impossible, to confirm.

Another theory is that cumulative-trauma disorders are a variant of fibrositis or myofascial disorders. Patients with classic fibromyalgia report (1) generalized or regional aching pain, weakness, fatigue and loss of endurance; (2) tender (trigger) points in various anatomic locations; (3) skin discoloration; (4) sleep disturbance; (5) psychoneurotic features, such as headache, irritable bowel syndrome, and medication disturbance; (6) psychological issues; (7) absence of

inflammatory findings; and (8) failure to improve with conventional treatment. Certainly, many of the patients whom orthopaedists see after a diagnosis of cumulative-trauma disorder have some or all of these symptoms.<sup>3,5</sup>

Some physicians and insurers believe that much of the increase in the incidence and socioeconomic impact of work-related disability is due to psychosocial and sociopolitical factors, particularly liberalized workers' compensation benefits in the industrialized countries.<sup>3</sup> The epidemic of repetitive-strain disorders began in Australia in the early 1980s, followed by an increased incidence in most of the industrialized countries. The incidence of repetitive-strain injuries in the Australian state of New South Wales increased from 762 in 1978–1979 to 2,263 in 1981–1982.<sup>21</sup> In 1988, Ireland<sup>27</sup> reported the Australian experience and concluded that most patients' complaints represented somatoform disorders, often associated with depression. He emphasized that accepted routine orthopaedic treatment usually fails, and until the psychological issues are addressed, the patients do not improve.

Hadler<sup>31–33</sup> has also stressed that these disorders are mainly due to psychosocial forces. He points out that patients with regional musculoskeletal symptoms can react in one of three ways. Many realize that their symptoms are minor self-limiting aches and pains with no serious consequences; they cope with the use of various personal resources, and the condition usually resolves. Others consult physicians because of persistent symptoms and concerns regarding the cause or need for additional treatment. In the third type of response, which is the most troublesome in today's workers' compensation milieu, and doubt-

less arises because of it, the patient attributes any discomfort to the job, reports the incident to the industrial-health officer, becomes a claimant in a workers' compensation lawsuit, and often becomes classified as a disabled worker.

The American Society for Surgery of the Hand has been concerned about the rising incidence and prolonged disability from cumulative-trauma disorders, as well as the lack of adequate scientific data regarding the etiology of these conditions. As a result, the Executive Council of that society drafted a statement that was presented to the Special Assistant for Ergonomic Programs at the Occupational Safety and Health Administration. The statement voiced concern that the National Institute for Occupational Safety and Health was prematurely adopting rules and regulations regarding cumulative-trauma disorders "which could be deleterious to the physical and psychological well-being of workers." The concern was "based on [their] conclusions that the current medical literature does not provide the information necessary to establish a causal relationship between specific work activities and the development of well-recognized disease entities."<sup>14</sup> The lack of a causal relationship has also been detailed in other publications.<sup>4</sup>

Many physicians believe that the causes of prolonged disability are multifactorial and may include musculoskeletal, ergonomic, and psychosocial factors. Bernard et al<sup>34</sup> studied the data on 973 newspaper workers with work-related musculoskeletal disorders and concluded that increased work, time pressure, and an increase in the number of hours spent using a computer were related to the occurrence of these disorders. Louis<sup>35</sup> concluded that most work-related disorders have an organic component but emphasized the need to

recognize the ergonomic and psychosocial issues as well to prevent prolonged disability.

## **Causes of Prolonged Disability**

We define the “at risk” population as the 20% of workers who cost the system 80% of health-care dollars.<sup>13,36</sup> Some would argue that the majority of this at-risk population are frauds or conscious malingerers. An insurance industry publication (*Lynch Ryan Report*, 1993;3:1) reported that there were no reliable data to substantiate the number of workers who fake injuries to stay out of work, but estimated that the incidence of true fraud is less than 5% of cases, confirming views of organized-labor leaders. We agree with these conclusions.

There is evidence that an additional 15% of the at-risk population are “fragile” workers with psychosocial problems. Although some of these patients magnify the seriousness of their symptoms and may give the appearance of conscious malingering or fraud, our experience rejects such labeling. The American Medical Association recently reported the marked increase in both physical and sexual abuse against women and noted a relationship to delayed somatoform disorders, including unexplained chronic musculoskeletal pain (*American Medical News*, Nov 13, 1995, pp 11-12). Another segment of the at-risk population are highly skilled and motivated workers who feel overworked, overstressed, and unappreciated.<sup>34,37,38</sup> In a downsizing, financially strained economy, the stresses of layoffs can exacerbate these perceptions. Yet another group of at-risk workers are poorly educated workers with low-paying, boring, unproductive jobs who do not feel that the company has any loyalty toward them. Workers in

this group may also have drug or alcohol problems or may have been physically or sexually abused.<sup>39-42</sup>

The impact of psychosocial issues has been evaluated in a number of studies. In a study of workers in the aircraft industry, Bigos et al<sup>43,44</sup> found that the factors determining return to work of patients with back pain were primarily related to job satisfaction and depression. We recently completed a study of 50 patients with a diagnosis of upper-extremity cumulative-trauma disorder: 6 had objective findings; 19, reasonable subjective findings; and 25, unreasonable subjective findings. Analysis of ergonomic and psychological factors indicated that the one determinant for return to work was the psychosocial profile. As in other studies, patients with long-standing disability who were angry, frustrated, depressed, and involved in litigation rarely returned to work.<sup>45</sup>

To identify the at-risk worker, a few pertinent questions asked during history taking can be very informative. Such questions might include the following: How are things going at work? Has the supervisor been supportive of your problem? Has he or she made proper work-station adjustments and understood restrictions? Do your co-workers feel sympathetic about your continued pain? Inquiring about the work environment, as well as home and family life, often will allow the patient to express feelings of stress and frustration.<sup>1</sup>

Certain industries have a high prevalence of work-related injuries. Data processors, data-entry clerks, supermarket checkout clerks, assembly-line workers, and meat and poultry processors have been noted to have above-average incidences of cumulative-trauma disorder.<sup>46,47</sup> Individual companies may have high incidences of work-related injuries and high rates of disability attribut-

able to factors such as poor safety records, inadequate attention to ergonomic issues, and, most notably, an unenlightened “corporate culture” and poor management of workers.<sup>48</sup>

The physical examination will often confirm the impression that the patient is an at-risk worker. Because most of the physical findings in cumulative-trauma disorders are subjective, they can be feigned or exaggerated. Wadell has developed a checklist of signs that indicate psychologic distress, including nonspecific and unexplainable pain, symptom magnification, nonanatomic sensory abnormalities, unreasonable grip measurements, and bizarre affects. Although he developed this checklist for low back disorders, it is applicable to other anatomic sites.

## **General Approach to Management of Work-Related Injuries**

Proper management that reduces both costs and disability is best provided by a team of health-care professionals who understand the unique features of work-related injuries.<sup>49</sup> It requires a partnership between the health-care provider, the employer, and the insurer, facilitated by close, frequent communication. The overriding objective is a safe, speedy return to work, with the interests of the patient being the primary responsibility.

We have found that physical therapists, hand therapists, and occupational-health nurses are ideally suited to act as case managers. Working closely with the treating physician, they can provide the necessary direction and continuity to lead the worker along the complicated path to a return to work. To resolve the many complicated issues, however, the physician must still as-

sume a leadership role.<sup>50</sup> The physician, the nurse, and the therapists together evaluate the worker and decide on an appropriate time to return to work with proper restrictions. The therapists and the nurse then implement these goals. Depending on the type of company, the company philosophy, and the worker's transferable skills, this can be an easy or a difficult process. In the case of chronic conditions, the case manager must communicate with the insurer. In difficult cases, a medical- or vocational-rehabilitation nurse can also be consulted to help manage the case.

In a hospital or clinic that specializes in work-related disorders, an occupational-health nurse is mandatory. Because the nurse can take on many clinical responsibilities, the physician is able to be more efficient, and the quality of service is improved.

When there are ergonomic issues and workstation problems, it may be beneficial for the nurse or therapist to make an on-site visit.<sup>51</sup> This provides an opportunity to evaluate the job site and the interpersonal dynamics between the patient and other workers. Visiting the work site with the patient also provides psychological support.<sup>52</sup>

As has been amply shown, prolonged disability is rarely due to the musculoskeletal injury, but is related more to the psychosocial and compensation issues that impede a speedy return to work.<sup>13,39,43,48</sup> State laws differ, but, in general, laws that were written to protect the worker often encourage illness and prolong disability. Case managers with a clear understanding of these potentially hindering factors can spend the time necessary to help the patient work through them. In chronic cases in which frustration, anger, and depression have become factors, formal psychological counseling is advisable.<sup>50,53</sup>

## Acute Injuries

Most acute upper-extremity injuries are minor and, when managed properly, usually involve minimal, if any, lost time and are resolved quickly.<sup>13</sup> Most patients are happy to return to work, and as long as communication with the employer is maintained to ensure proper restrictions, a smooth return to work can generally be accomplished. We have seen many patients who might have been categorized as at risk for prolonged disability return to work after being assured that the job was safe and appropriate. For patients with acute injuries, the fear of additional injury and the fear of working with pain may be impediments to a return to work; education and reassurance are among the most important aspects of treatment.<sup>54</sup> The treatment of patients who do not speak English can be difficult and requires patience and the expenditure of additional time by health-care providers. The therapist and the occupational nurse are especially important in this effort.<sup>50,55</sup>

Appropriate modified work is sometimes available, but for any number of reasons the patient may resist accepting the job. We believe the patient should be supported in such decisions. Our answer to the employer who questions our recommendation to allow the worker several days off work, rather than a return to the modified job, is that 3 days of lost time is preferable to the potential cost of a worker's compensation lawsuit. Decisions about how to manage this type of case will also be influenced by the statutes of the particular state. For example, in Massachusetts, the laws are tilted in favor of the worker, which makes it doubly important to avoid litigation. In several days, if the worker's attitude has not changed, return-to-work

goals should be established. When a potential problem is noted, the employer and the insurer must be informed.

When the injury is more serious, the physician's role, in addition to providing proper medical treatment, is to inform the employer and the insurer of the seriousness of the condition, the expected time loss, and the potential for returning to the job or the need for a temporary or permanent job change. When surgery is indicated, the concern and support of the employer and the insurer during the immediate postoperative recuperation period are important in preventing long-term disability and litigation.

Minor injuries like sprains and contusions require no lost time or only a few days of restricted work. Nurse's aides, hotel housekeepers, restaurant workers, and most material-handling and manufacturing workers can usually be placed in light-duty positions. However, return to work is more difficult for those engaged in construction, fire, and police work. In the case of more common significant injuries, such as shoulder injuries, 1 to 2 weeks of lost time may be involved. Our approach is to recommend 2 to 3 days of rest followed by a physical therapy program, usually three to five times per week. We attempt to get the patient back to modified work in 2 to 4 weeks. When the progress is slow or "risk factors" are identified, we continue to reevaluate the patient carefully. Although restrictions are individualized and the patient's input regarding restrictions is addressed, we generally adhere to accepted guidelines (Table 1). After the patient returns to adjusted work, therapy is continued if indicated. This program emphasizes rehabilitating the injured part, as well as having the patient enter an aerobic

**Table 1**  
**Guidelines for Tasks in Job Categories**

Job Category	Job Description	Weight Lifted, lb*	Weight Pushed or Pulled, lb*	Weight Carried, lb*	Climbing†	Body Motion‡	Sitting-Standing Transition§	Walking, % of day
1	Sedentary	10/0	150/0	≤10/0	Ramp/none	<10	30 min	10
2	Sedentary to light	15/≤ 5	200/100-125	15/≤ 5	None/ramp	<10	30 min	20
3	Light	20/≤ 10	250/125-150	20/10-15	Stairs/none	10-15	30-45 min	30
4	Light to medium	35/≤ 20	300/200-250	35/20	None/stairs	15-20	45 min to 1 hr	40
5	Medium	50/≤ 20	350/250-300	50/25-30	Ladder/stairs	20-30	1-1.5 hr	50
6	Medium to heavy	75/≤ 35	400/300-350	75/30-40	Scaffold/ladder	30-40	1.5-2 hr	60
7	Heavy	100/≤ 50	450/350-400	100/40-50	Poles/scaffold	40-60	2-2.5 hr	70
8	Very heavy	>100/>50	>450/>400	>100/>60	Rope/poles	>60	>2.5 hr	80

\* Values are expressed as weight infrequently involved/weight frequently involved.

† Descriptions are expressed as type of climbing infrequently performed/type of climbing frequently performed.

‡ Values are number of instances of body motion (bending, kneeling, squatting, or reaching) engaged in per hour.

§ Values are time spent in continuous transition between sitting and standing positions.

conditioning program. The patient should spend 1 to 1½ hours in the gym three times a week for 6 to 12 weeks, depending on the injury and the patient's age and physical condition.

## Subacute and Chronic Work-Related Injuries

Subacute and chronic work-related injuries include cumulative-trauma disorders and sprains with persistent pain, as well as fractures and other major injuries. In general, injuries are classified in this group 6 weeks to 3 months after onset. One of the most important factors that affects management is whether the patient is working.

### Working Patient

The most frequent chronic work-related problems involving the upper extremities are cervicobrachial

strains, shoulder injuries, and cumulative-trauma disorders of the arms and hands. If these conditions are recognized early (in the first 2 to 4 months), appropriate job management and medical treatment will usually result in a favorable outcome. The most difficult cases are those in which patients with long-standing pain have had poor management.

After diagnosis, physical therapy is usually prescribed, placing major emphasis on education, body mechanics, stretching, and methods to deal with stress in the workplace. The therapist may visit the job site to evaluate the workstation and the overall environment. A meeting with employers or rehabilitation counselors is sometimes necessary to implement recommendations. Educating the patient regarding prevention of both physical and job stresses is important. Employee-assistance programs are sometimes

suggested when job or home stresses seem to be a factor. When modifications cannot be made in the job, we recommend a permanent job change or vocational rehabilitation.

In a study that identified psychosocial issues as the primary deterrent to patients' returning to work, we identified an interesting subset of subjects. Those who were working when seen, even if they had long-standing pain and unreasonable findings, could be rehabilitated with proper support.<sup>45</sup> In most instances, the therapist and the occupational nurse could successfully manage the case with the support of the employer and the insurer.<sup>50</sup>

### Nonworking Patient

Patients with chronic injuries who are not working are much more difficult to manage, and the prognosis for resolution is poorer.



The first objective is to determine whether there is a medical inability to return to work. For example, if the patient is a 62-year-old construction worker with no other skills whose hand has been amputated, there is little, if any, medical potential to return to work. The second objective is to decide whether there is a nonorthopaedic condition that limits the potential for return to work. An unemployed 50-year-old factory worker with a 2-year history of chronic back pain who is depressed and has a diagnosis of chronic pain syndrome is unlikely to return to work. In these cases, the physician's role should be to inform the involved parties that additional medical treatment is inappropriate, and resolution of the insurance claim becomes the major objective.

When the physician determines that there is both an orthopaedic potential and a psychosocial potential to return to work, our approach is as follows: We carefully inform the patient that we do not deny their complaint of chronic pain, but that orthopaedic surgery is not indicated. We emphasize that the pain can improve with a multidisciplinary approach, which includes a physical rehabilitation program emphasizing both therapy for the injured part and a general aerobic program. In some cases, a formal functional-capacity evaluation is helpful in gauging actual capability to work, as well as in identifying submaximal efforts and symptom magnification. At the same time, psychosocial and pain issues are addressed. Depending on the patient's condition, psychological counseling, antidepressant medication, and/or a stress-management program may be instituted.<sup>10,56</sup> The third, and critical, component is job rehabilitation. The patient must be willing to return to an appropriate job that will be carefully monitored and supported.

For these programs to succeed, it is important to be assured of full cooperation by the insurance carrier. This includes financial acceptance of both orthopaedic and physical therapy, as well as approval to pay for psychological counseling, if necessary. Additionally, we require a rehabilitation nurse from the insurer or employer with vocational skills to work with our in-house team. If the patient is represented by counsel, the attorney must agree to our treatment plan, especially the return-to-work component. In return for the insurer's cooperation, we agree that the treatment will be time-limited and that if in a reasonable time we have not returned the patient to work, we will work with the insurer to bring the case to closure.

The treatment program generally requires 3 months, because job placement is often slow and the patient must have team support until he or she is functioning in the new job. We continue to follow the patient's progress after the return to work and address stressful issues that arise. When the patient, the insurer, the plaintiff's attorney, and the employer have all agreed with the plan, our program has achieved a high rate for return to work. Unfortunately, most patients with chronic pain and long-standing disability will not agree to enter such a program (usually because of the plaintiff's attorney's desire to have a financial settlement, instead of returning the patient to work).

### **Surgical Indications**

Just as the treatment program for work-related disorders differs from that for non-work-related disorders, the indications for surgery vary, and the decision to advise surgery must be carefully considered, especially with at-risk patients. Many studies have shown that patients receiving

workers' compensation have less favorable results after surgery, often associated with prolonged disability. These studies have most frequently involved carpal tunnel surgery and lumbar spine surgery.<sup>57-59</sup> There are four situations in which surgery should be advised with caution: (1) the clinical features are not clear; (2) pain is the predominant complaint; (3) there are major psychosocial issues; and (4) the surgical procedure is unlikely to restore the patient to his or her job.

### **If the Clinical Features Are Unclear**

When the clinical presentation is unclear, surgery should be advised with caution. This situation is frequently seen in cases of upper-extremity nerve entrapment, especially carpal tunnel syndrome. When the results of provocative tests are equivocal, nerve conduction is either normal or mildly positive, and the results of a diagnostic corticosteroid injection are questionable, the results after surgery are often poor. In such cases, as well as in cases of questionable cubital tunnel syndrome, one must also carefully evaluate the patient for cervical spine disease and thoracic outlet syndrome.

### **If Pain Is the Primary Complaint**

Surgery must be advised cautiously when pain is the predominant clinical feature, especially when the pain is dramatized and the patient has other characteristics suggestive of chronic pain syndrome.<sup>60</sup> These characteristics, referred to as the "six D's," include: (1) duration of pain, (2) drug use, (3) disability, (4) dysfunction, (5) dramatization, and (6) depression. Patients with chronic pain syndrome frequently have long-standing disability, and the outcome of surgery is generally poor.

### If There Are Psychosocial Issues

Patients with major psychosocial issues or chronic disability and those who are involved in litigation often do not do well after surgery. It is often stated that the surgical scar legitimizes the pain and is an important factor in making the disability permanent. When possible, it is advisable to delay the surgery until all other issues have been resolved. In some cases, attempting to return the patient to work with proper restrictions is advisable. Working with a rehabilitation nurse to resolve job or home conflicts or stresses can be important in ensuring a more successful surgical result.

### If the Procedure Is Unlikely to Return the Worker to the Job

Surgery should be advised cautiously when it is questionable that the procedure will allow the worker to return to his or her job. When patients have unrealistic expectations that are not achieved, their distress, anger, and frustration often result in prolonged disability. In this situation, job modification or vocational rehabilitation may be a wiser choice. Return to work should not be the sole indication for surgery, however, and a person should never be denied surgery if the indications are appropriate.

### Role of the Orthopaedic Surgeon in Treating Work-Related Disorders

What role should the orthopaedic surgeon play in the management of

cumulative-trauma work-related disorders? Many orthopaedic surgeons refuse to treat work-related injuries because the rate of reimbursement is relatively low in some areas of the country, the patients can be difficult, and the paperwork and legal involvement are so time consuming. James Strickland, in his presidential address to the members of the American Society for Surgery of the Hand, advised hand surgeons to refer chronically disabled patients with unexplained pain back to their referring doctors.<sup>61</sup> Gerald B. Stuyvesant, Commissioner for Workers' Compensation for the State of New Mexico, has also addressed the role of the physician in work-related disorders.<sup>36</sup> He points out that physicians are not trained to address nonmedical issues and often have difficulty being part of a team whose goal is getting patients back to work. Furthermore, he says that surgeons are trained to perform surgery, and in work-related disorders, surgery may not be the procedure of choice.

In today's changing health-care environment, the physician will have less authority, autonomy, and control. This is true in the treatment of workers' compensation patients, just as it is in the treatment of patients with non-work-related injuries. In workers' compensation cases, the employer, the insurer, and the case manager are exercising much more control than in the past. For example, we often see a patient for a second opinion who has been

scheduled by the insurer for a functional-capacity evaluation, which we might consider inappropriate. In many states, utilization-review nurses either approve or deny surgery on the basis of criteria established for the proposed procedure. Although this may be appropriate, it is another instance of the physician having less control—something we will probably have to accept. The orthopaedic surgeon who chooses to treat workers' compensation patients can function as a consultant to the occupational-medicine physician or company physician regarding the musculoskeletal diagnosis and the need for treatment. In this role, the orthopaedist may not directly manage the problem, but needs to understand all of the non-musculoskeletal issues and be able to recognize somatoform disorders and chronic pain disorders, as well as be knowledgeable about ergonomics and job modification.

### Summary

Trying to manage work-related disorders can be frustrating, but the orthopaedist who chooses to be involved in the treatment of these conditions can find it rewarding if supported by a well-trained staff. Physical therapists, occupational therapists, hand therapists, and nurses can all be trained to be case managers. In our experience, a team approach can result in significant reductions in costs and disability.

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