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Preface

Pain Rehabilitation

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This issue of the *Physical Medicine and Rehabilitation Clinics of North America* deals with strategies for evaluating and treating chronic pain. Physiatrists need skill in managing chronic pain because they encounter it frequently. Some physiatrists focus their clinical practices on patients who have pain as their major reason for seeking health care. These include physiatrists who work at pain centers and those who focus on the management of spinal disorders. Other physiatrists treat patients who are disabled by conditions that are not necessarily painful, such as spinal cord injury and stroke. For these physicians, pain might be construed as a secondary problem that complicates their attempts to rehabilitate patients. Unfortunately, it is a secondary problem that they are likely to encounter routinely because epidemiologic research demonstrates a high prevalence of chronic pain in most of the patient populations that physiatrists treat (see the article by Ehde and Hanley).

Approaches to pain

Physicians usually provide an eclectic mixture of therapies when they treat patients with chronic pain. Many of the therapies defy any simple classification scheme. For purposes of exposition, though, it is possible to classify most of them into three broad groups: curative/disease modifying, rehabilitative, and palliative.

The curative approach is the simplest to understand and the preferred one when it is applicable. From this perspective, pain is a symptom that, in combination with other symptoms and signs, helps the physician identify

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a pathophysiologic process that becomes the target of treatment. In an ideal situation, once the underlying biologic disturbance has been identified and reversed, the patient's symptoms resolve without any additional treatments. Common examples of pain treatment based on the curative perspective include internal fixation and casting for a patient who presents with a painful wrist fracture, appendectomy for a patient who presents with right lower quadrant pain secondary to appendicitis, and angioplasty for a patient who presents with chest pain secondary to cardiac ischemia.

Unfortunately, attempts to relieve pain by curing an "upstream" pathophysiologic process sometimes fail. The reasons for such failure are multiple. Obvious ones include the inability of physicians to identify a pathophysiologic process to account for a patient's pain or their inability to treat the process. A more subtle reason for failure of the curative approach is that chronic pain in some patients may be maintained by alterations in the manner in which the nervous system encodes and processes sensory information rather than by nociception from ongoing tissue injury (see the article by Curatolo and colleagues).

This issue of the *Physical Medicine and Rehabilitation Clinics of North America* focuses on situations in which no curative therapy for pain is available, so that physicians are left with the task of managing the pain. In doing so, they typically use some combination of rehabilitative therapies and palliative therapies.

In a general way, pain rehabilitation is similar to rehabilitation of any medical condition—its goal is to optimize functioning through a combination of physical conditioning, skills training, education, and mobilization of patients' psychologic resources. Many of the patients treated by physiatrists undergo rehabilitative treatment for disorders (eg, spinal cord injury) that may be associated with pain but invariably involve numerous functional deficits unrelated to pain. For these patients, pain rehabilitation becomes a component of the overall rehabilitation program. Thus, for example, a paraplegic who reports shoulder pain as he transfers or uses his wheelchair might experience pain resolution as a result of conditioning to improve his upper body strength and training to improve his transfer techniques. In other settings, pain is the focus of rehabilitative treatment. The best example of this is multidisciplinary pain rehabilitation (see the article by Stanos and Houle).

Rehabilitative therapies influence pain indirectly by addressing secondary effects of the pain (eg, deconditioning) and improving patients' coping skills, whereas palliative therapies focus directly on the pain experience itself. For example, opiates blunt or eliminate the experience of pain without requiring patients to do the kind of work that is demanded by rehabilitative therapies.

Preview

This issue of the *Physical Medicine and Rehabilitation Clinics of North America* describes a variety of palliative and rehabilitative treatments that

may be relevant to patients that you treat. It starts (in the article by Curatolo and colleagues) with a review of recent neurobiologic research that supports the role of central hypersensitivity in chronic pain. In a general way, this research supports the conclusion that nociceptive barrages from injured tissues can cause changes in an individual's central nervous system such that his/her subsequent experiences of pain are altered. The concept of central nervous system hypersensitivity provides a possible explanation of the common clinical observation that chronic pain often persists in the absence of on obvious source of ongoing tissue injury.

The article by Ehde and Hanley summarizes epidemiologic research on pain among patients who have various conditions that are typically treated by physiatrists, including spinal cord injury and traumatic brain injury. This research supports two conclusions: (1) that chronic pain has a high prevalence in most of these patient groups and (2) that chronic pain has significant implications for quality of life among the patients.

The article by Fechtel describes strategies for the clinical evaluation of patients who have chronic pain. It highlights the fact that a clinician must adopt a broad perspective when evaluating such patients. Although an evaluation might identify an obvious biomechanical or neurologic cause for a patient's symptoms, Fechtel's article reminds us that the astute clinician must attend to indicators of psychosocial dysfunction as well as biomechanical dysfunction.

The article by Allen addresses pain management therapies that are typically used by physical therapists. It considers the scientific rationale for these physical modalities and the evidence for their efficacy in the treatment of pain. The article does not include a discussion of exercise therapy as a treatment for painful conditions despite the fact that most pain specialists view exercise therapy as extremely valuable for chronic pain patients. This omission reflects my assumption that physiatrists are well versed in exercise therapy.

The articles by Dugowson and Gnanashanmugam, Sullivan and Robinson, Meleger, and Bloodworth deal with pharmacologic agents for the management of pain, including anti-inflammatories, antidepressants, anticonvulsants, muscle relaxants, and opiates. Multiple articles are directed toward pharmacologic therapies because physicians involved in pain management need to have a good grasp of the pros and cons of the many medications that may be helpful in controlling pain.

The article by Osborne and colleagues discusses a range of psychologic therapies that have been developed for this purpose. The broad premise underlying these therapies is that patients who have chronic pain function better if they change behaviors related to their pain and develop appropriate coping strategies and beliefs regarding their pain.

The article by Stanos and Houle is the only article in the issue that focuses on pain rehabilitation. It describes multidisciplinary pain rehabilitation programs in which a variety of rehabilitative interventions are combined to maximize recovery among patients with refractory chronic pain.

The article by Simpson reviews complementary and alternative medicine approaches to the treatment of pain. Physicians who manage pain need to be familiar with these because many patients who have pain choose to undergo complementary and alternative medicine therapies, often in conjunction with allopathic treatments.

Whereas the articles by Dugowson and Gnanashanmugam, Sullivan and Robinson, Meleger, Bloodworth, Osborne and colleagues, Stanos and Houle, and Simpson deal with specific approaches to pain, the articles by Sherman and colleagues, and Borg-Stein focus on specific medical conditions that physiatrists are likely to treat. The article by Sherman and colleagues addresses pain in the context of traumatic brain injury (TBI). As the authors note, chronic pain is a common and vexing problem among TBI patients. Also, the dilemmas that a physician faces when choosing pain treatments for TBI patients are similar to those he/she must face when treating other patient populations with cognitive impairments. The article by Borg-Stein discusses the management of myofascial pain. Myofascial pain is important to physiatrists for two reasons. First, it is felt to have a high prevalence among patients with chronic pain as a primary problem or a secondary one. Second, physiatrists have historically played a major role in the elaboration of theories of myofascial pain and strategies to treat the condition.

What is not covered

This issue of the *Physical Medicine and Rehabilitation Clinics of North America* does not include any systematic discussion of the types of exercise therapy available for patients who have chronic pain or the settings in which exercise therapy might be used. This omission does not imply a disregard of exercise therapy on my part. In fact, I share the widely held view among pain specialists that exercise therapy is absolutely fundamental to effective rehabilitation for most patients who have chronic pain. Rather, the absence of an article on exercise therapy reflects my assumption that that physiatrists are familiar with exercise therapy and routinely try to activate their patients. Thus, this issue is devoted to options that the physiatrist has when patients continue to complain of disabling pain despite having undergone an appropriate trial of exercise therapy.

The issue also does not address therapies that are relevant only to narrow segments of the patient populations that physiatrists are likely to treat. For example, it does not contain a detailed discussion of pharmacologic therapies for migraine headache. Also, it does not include an article on injection therapies, such as facet neurotomies and epidural steroid injections, because these therapies are limited to patients who have spinal pain.

Finally, this issue does not contain a discussion of implantable devices, such as peripheral nerve stimulators, spinal cord stimulators, and intrathecal opiate pumps.

Prototypical cases

To promote continuity across the articles that comprise this issue of the *Physical Medicine and Rehabilitation Clinics of North America*, the authors have been asked to consider how their therapeutic approaches might be used in the treatment of four modal patients. Vignettes describing these patients are given below.

Case 1

A 19-year-old man was involved in an accident while driving a motorcycle. He was not wearing a helmet. He hit his head into a telephone pole during the accident and sustained a skull fracture with intracerebral bleed. He was comatose for 10 days afterward. He did not sustain any other significant injuries in the accident. After his coma resolved, he demonstrated significant cognitive difficulties, along with right-sided paresis and spasticity. He now reports diffuse pain in his right lower extremity. There is no obvious orthopedic reason for this. His right lower extremity pain is thought to be a neuropathic type of pain secondary to his brain injury, with some aggravation caused by his spasticity.

Case 2

A 70-year-old woman has been treated for diabetes mellitus for the past 10 years. She complains of burning pain in both feet. This is severe enough that she reports substantial limitations in her physical activities and severe disruption of her sleep. She has undergone electrodiagnostic testing that demonstrated abnormalities consistent with a diabetic polyneuropathy. The patient's general medical status is noteworthy in that she had a mild myocardial infarction 3 years ago, with subsequent angioplasty. Follow-up evaluations have shown normal left ventricular function and mild to moderate coronary artery stenosis. The patient has a history of hypertension that is adequately controlled with Lisinopril.

Case 3

A 35-year-old woman was rear ended in a motor vehicle accident 1 year ago. She initially complained of fairly diffuse posterior neck pain but reported no discomfort in her shoulder girdle, mid back, or low back and no symptoms suggesting a cervical radiculopathy. A cervical MRI scan was negative for a disk herniation or compromise of neural elements. The patient has been seen by an interventional pain physician, who suspected a facet arthropathy. However, diagnostic medial branch blocks to anesthetize the C5-5 and C6-7 facet joints produced no pain relief, and the interventional pain physician does not think he has more to offer the patient. Since the time of the accident, the patient's pain has gradually spread, so that it now involves essentially the entire spine. On examination, the patient seems

to have trigger points involving the upper trapezius and levator scapulae muscles bilaterally. She reports tenderness in 14 of the 18 sites designated by the American College of Rheumatology for the diagnosis of fibromyalgia.

Case 4

A 34-year-old male roofer fell off a roof 1 year ago and sustained an L1 vertebral body fracture. There was no neurologic compromise. An orthopedist recommended against surgical management. The patient was treated conservatively with bracing for several weeks and then went through extensive physical therapy with only modest benefit. Radiographically, his condition stabilized, with no identifiable abnormality other than a 30% loss of height of the L1 vertebral body. He has undergone evaluation by an interventional pain physician. Diagnostic injections including medial branch blocks and discography at the thoracolumbar junction did not delineate any specific pain generator that might be a target for interventional therapy. The patient currently reports severe pain at the thoracolumbar junction. He has no symptoms in his lower extremities.

These cases were selected to represent musculoskeletal pain, neuropathic pain, and fibromyalgia. Complicating factors include cognitive disturbance (Case 1) and cardiovascular disease (Case 2).

As you read the articles in this issue, you will find frequent references to these cases. Also, you will note that most of the authors have amplified the thumbnail sketches given above. Their need to elaborate illustrates the fundamental fact that chronic pain is a product of multiple factors. Consequently, practitioners must go beyond basic medical data to decide how to treat these patients.

A final word

Many physicians find chronic pain difficult and emotionally challenging to treat. Their reticence reflects three basic facts about chronic pain. First, pain is a personal experience that cannot be fully confirmed by a physician or any other third party. Thus, a treating physician frequently experiences uncertainty about how to interpret a patient's pain complaints. This ambiguity becomes especially challenging if the patient demands high doses of opiates to control pain or reports a degree of incapacitation that seems to be excessive relative to the severity of the medical condition. Second, chronic pain reflects the combined influence of a wide range of biologic, psychological, and social factors. Thus, a physician who tries to understand the factors underlying a patient's pain complaints must have expertise in areas other than just the pathophysiology of injuries and diseases. Third, most of the commonly used treatments for chronic pain have not been validated in well-designed studies, and the treatments that have been validated generally demonstrate only modestly beneficial effects. As a result, a physician who

treats chronic pain usually cannot practice evidence-based medicine and must be prepared to encounter frequent failures.

The material in this issue does not eliminate the above challenges. In particular, because the various therapeutic approaches described in this issue have essentially never been subjected to head-to-head comparisons, you will not find anything like a simple algorithm to follow when you treat your patients. What the articles do provide is a set of options, along with information about the scientific support for the options and the clinical settings where the options might be considered. Given the widespread gaps in our scientific knowledge regarding the treatment of chronic pain, the orchestration of specific therapies into a coherent treatment program for a chronic pain patient pain still depends on clinical judgment.

I would like to express my appreciation to Dr. George Kraft for asking me to edit this issue of the *Physical Medicine and Rehabilitation Clinics of North America* and to Molly Jay, who has provided the editorial support needed to bring the issue to print. I am especially appreciative of the efforts of the many researchers and clinicians who have taken time from their busy schedules to contribute to the issue. I believe that their cumulative efforts have resulted in an issue that provides conceptual clarity and practical tools for physiatrists.

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