



# Unraveling the Chain

When chronic pain evades a clear diagnosis, where do you begin?

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**T**herapists and rehab clinicians are well aware of the prevalence of chronic musculoskeletal pain, but often remain confused over a true diagnosis and treatment plan. Clinicians can even become fearful and frustrated when facing these baffling cases.

Nevertheless, patients with pain originating from the musculoskeletal system constitute the largest group of patients receiving physical therapy care.<sup>1</sup> Today's faster-paced but sedentary lifestyles, combined with stress and poor fitness and diet, contribute to the high incidence of these conditions.

The enigma surrounding chronic musculoskeletal pain arises from a lack of clear tests, definitions and diagnoses. Even after the disorder has progressed, causative factors can continue to elude identification and frustrate the treatment team. Unlocking the mystery of these syndromes begins by identifying the interweaving factors that contribute to pain, and outlining a logical method of treatment.

## A HOLISTIC APPROACH

Chronic musculoskeletal disorders (MSDs) are usually characterized by pain that can be localized or widespread. Typically, there's no underlying systemic disorder.

Associated conditions may include myofascial irritation, peripheral or central neurogenic involvement and mechanical dysfunction. Therefore, you must address myofascial, periarticular, articular and neurogenic factors. Entrapment, impingement, adhesions and mechanical misalignment are all probable causes of irritated tissues and

nerves, which leads to the MSD symptom complex.

When assessing a patient with a chronic MSD, begin with a holistic perspective and ask general questions. Is the chronic MSD a result of repetitive use, static or poor posture, trauma, or stress-related factors? Chronic MSDs develop over time, and their effects are usually cumulative.

During your evaluation, seek to identify the chain of events. This assists in designing a treatment protocol that can unravel the chain. The best strategy for a successful outcome is to develop a reasonable hypothesis of causal and contributing factors, perform a specific examination, formulate a diagnosis, provide a well-designed treatment strategy, and evaluate the outcome.<sup>2</sup>

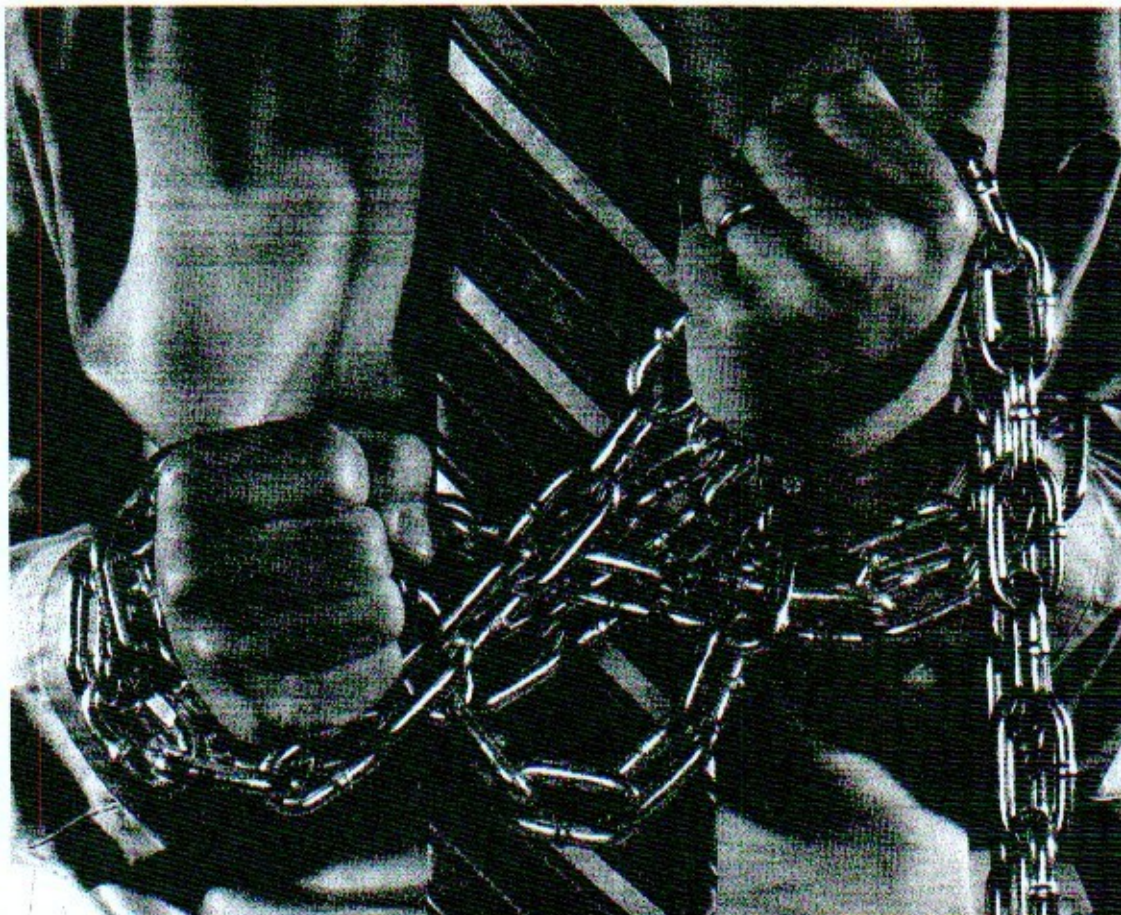
Perhaps the most potent factor that complicates many MSDs is the concept of physiological "cycles." Physiological cycles caused by pain affect muscle and soft tissue, bony alignment, peripheral nerves, blood flow and autonomic responses. They are considered cycles because the initial effects of an injury soon perpetuate the disorder. A closer look at specific implications shows the extent of these physiological processes.

- **Muscle changes.** At the musculoskeletal level, the most obvious effect of chronic pain is inflammation. However, increased tension in the muscles—due to repetitive or prolonged work

## DID YOU KNOW?

Chronic pain among U.S. workers rose 40 percent from 1996 to 2006.

SOURCE:  
Harris Interactive



or poor work habits—can lead to excessive stretching in the elastic component of a muscle, and reduced action potentials (reduced permeability to sodium and excessive calcium ions in sarcoplasm).

Tension can also elicit ATP depletion and fatigue, and lead to areas of physiologic contracture. These muscle tissue changes can cause compression or entrapment syndromes, and can reduce joint mobility. The result can be mis-

alignment, which promotes muscle imbalance and damage.

In today's sedentary world, where slumped posture seems to be encouraged, postural alignment may be already disrupted. Wolff's law states that bones adopt the shape of the forces imposed on them. Tight tissue and muscle imbalances disrupt optimal alignment and make the body vulnerable to mechanical stresses.

In cases of thoracic involvement, this could

result in sympathetic dysfunction. Ischemia due to compression and entrapment can reduce muscle force and cause fatigue.<sup>3</sup>

• **Neurogenic factors.** Musculoskeletal tightness and reduced joint mobility can lead to neural entrapment and reduced neural glide. A strain of just 6 percent to 8 percent can limit blood flow in a nerve, and alter nerve function.<sup>4</sup>

Repeated input of stress and pain stimuli causes repetitive firing of neurons, and thus a prolonged hyperexcited state. This can lead to synaptic fatigue at the neuromuscular junction. Consequences of neurogenic involvement include a further deterioration of movement, reduction of activity level and sympathetic involvement.

• **Stress.** Pain is highly correlated to stress. Stress activates the sympathetic and endocrine responses. It raises heart rate, blood pressure and muscle activity.<sup>5</sup>

Decreased oxygenation hinders healing and promotes inactivity. This triggers a sympathetic response, in addition to degrading myofascial tissues. It's been shown that hypoxia inhibits synovial cell proliferation and the synthesis of matrix components.<sup>6</sup>

Even people with strong muscles can experience pain syndromes. This is probably due to development of altered movement patterns, such as increased scapular movement with shoulder range of motion. These altered movement patterns develop over time, depending on usage. Muscle and functional activity retraining can correct faulty movement patterns.

#### MULTIFACTORIAL MYSTERY

When patients present with chronic musculoskeletal pain, several intertwining factors are usually at play. For example, patients with chronic neck pain and altered spinal curves frequently have a history of low back pain—and vice versa. As you treat one condition, the other often gets worse. Similarly, a finding of poor tissue health on palpation probably means poor alignment and poor movement patterns, and adverse neural tension.

Treating chronic injuries is a dynamic process of unraveling the syndrome to identify its various pieces and their interactions. Treating the painful area without addressing the causative factors is incomplete and can result in a poor outcome.

Design your therapy plan to reduce myofascial tension and tightness, lower neural and vascular compression, enhance neural glide, increase strength and endurance, restore normal posture and alignment, and teach correct body mechanics.

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Emerging evidence suggests that physical exercise can decrease pain sensations in young and old subjects.

According to research presented at the American Pain Society's annual conference, healthy college students exhibited higher pain thresholds of the right index finger after carefully controlled static isometric contractions of the left elbow extensor muscles.

And a separate study of assisted care residents over the age of 80 showed that a supervised exercise program resulted in significant

decreases in pain symptoms. One group lifted 1- to 2-lb. weights, while others performed a light stretching program.

Researchers hope to use the studies as a springboard for more research. "We have this clinical evidence [that] exercise can reduce pain," says Kathleen Sluka, PhD, PT, professor of physical therapy at the University of Iowa in Iowa City. "But we have yet to determine how much is beneficial and how much only exacerbates the pain."

Source: American Pain Society

One common mistake is a hasty initiation of exercises in the presence of tissue damage and neural and vascular compression. With chronic MSDs, retraining the sympathetic nervous system is essential.

Patients in chronic musculoskeletal pain can be the most challenging cases you'll face. Many people have been abandoned by other health care specialties and have reached the desperation point.

By methodically examining intertwining causes and risk factors, you can return these patients to a full and active life. ■

#### References

1. Jette, A.M., & Davis, K.D. (1991). A comparison of hospital-based and private outpatient physical therapy practices. *Physical Therapy*, 71(5), 366-375.
2. Sahrmann, S.A. (2002). *Diagnosis and treatment of movement impairment syndromes*. St. Louis: Mosby.
3. Murthy, G., Hargens, A.R., Lehman, S., & Rempel, D.M. (2001). Ischemia causes muscle fatigue. *Journal of Orthopaedic Research*, 19(3), 436-440.
4. Clark, W.L., Trumble, T.E., Swiontkowski, M.F., & Tencer, A.F. (1992). Nerve tension and blood flow in a rat model of immediate and delayed repairs. *Journal of Hand Surgery*, 17(4), 677-687.
5. Wahlstrom, J., Hagberg, M., Johnson, P.W., et al. (2002). Influence of time pressure and verbal provocation on

physiological and psychological reactions during work with a computer mouse. *European Journal of Applied Physiology*, 87(3), 257-263.

6. Rempel, D., & Abrahamsson, S.O. (2001). The effects of reduced oxygen tension on cell proliferation and matrix synthesis in synovium and tendon explants from the rabbit carpal tunnel: An experimental study in vitro. *Journal of Orthopaedic Research*, 19(1), 143-148.

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