



Osteopathic Manipulative Medicine Considerations in Patients With Chronic Pain

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Osteopathic manipulative medicine (OMM) incorporates diagnostic and therapeutic strategies that address body unity, homeostatic mechanisms, and structure-function interrelationships. In regard to pain, osteopathic physicians take thorough histories guided by palpatory examination to determine the quality, duration, and origin of this condition, how it uniquely affects the individual, and whether segmental, reflex, or triggered pain phenomena coexist. Osteopathic manipulative medicine expands differential diagnoses by considering somatic dysfunction and treatment options by integrating specific aspects of complementary care into state-of-the-art pain management practices.

Prescriptions formulated through an OMM algorithm integrate each osteopathic tenet with biopsychosocial and patient education models and medication, rehabilitation, and manual medicine techniques proportionate to individual needs.

Chronic pain is a common problem that has a relatively high incidence and a low recovery rate.¹ The incidence of relapse following initially successful treatment is also significant. Persistent or relapsing pain often results from misdiagnosis or inadequate treatment.² In other instances, focusing on pain generators alone overlooks important patient-centered treatment strategies that are capable of modulating pain perception and quality of life. Finally, non-compliance with otherwise successful

treatment programs may result from inadequate education concerning the prognosis and management of chronic disorders such as arthritis.³

Dissatisfied with ineffective, incomplete, and sometimes impersonal approaches to chronic disorders, a growing number of patients actively pursue complementary or alternative care, including manual modes of therapy and mind-body practices.^{4,5} Properly prescribed approaches may confer some clinically significant benefits. It is recognized that many other manual modes of therapy such as massage and chiropractic provide distinct solutions for patients with chronic pain that would otherwise be ignored by nontouch modalities.

Osteopathic manipulative medicine (OMM) is a component of osteopathic medicine's approach to total patient care. It emphasizes application of osteopathic philosophy and integrates recognized healing approaches known as osteopathic manipulative treatment (OMT). Although OMM is generally recognized as a mainstream discipline, the National Institutes of Health considers OMT to be one of several promising "complementary" procedures among a variety of heterogeneous manipulative and body-based practices. An OMM approach provides the balance that patients with persistent pain seek between state-of-the-art interventions and individualized patient-centered care. For such patients, OMM treatment offers two main recognized advantages: an expanded differential of potentially treatable etiologies and an individualized, patient-centered pain prescription based on the application of osteopathic principles.

Many osteopathic physicians emphasize patient education and offer a pragmatic philosophy similar to that adopted by multidisciplinary pain management clinics. In addition, OMT offers patients an additional therapeutic option with a low risk-to-benefit ratio and a growing evidence base of efficacy.⁶

General Considerations in Patients With Chronic Pain

Chronic pain mechanisms encompass a complicated array of different processes (eg, genetics, neurophysiology, psychology, and biomechanics), each capable of contributing to clinical manifestations and symptoms. For OMM to be effective, similar symptoms in different patients may require dissimilar treatment plans that focus on differing local, spinal, and supraspinal targets. For example, chronic pain initiated by peripheral trauma may result when supraspinal structures continue to respond as if the peripheral tissues were actively injured. In other chronic conditions like fibromyalgia, the process may reflect an autonomic dysregulatory phenomenon or a dysfunction of descending antinoci-

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ception pathways. Other conditions such as myofascial trigger points (MTrPs) demonstrate specific peripheral dysfunction at a spinal level perpetuated by nonspecific biomechanical factors, eg, untreated postural strain, or through viscerosomatic reflexes.

In many cases, chronic pain pathways involving allodynia (generalized lowered thresholds to pain) develop as changing gene expression allows silent receptors to become active in the spinal cord, or when facilitatory modulation results in what is called “spinal cord learning.”^{7,8} In each case, the patient may simply present with persistent pain.

Therefore, rational OMT of patients with persistent pain cannot have a singular focus, nor can it be treated as a static phenomenon. In formulating multimodal treatment plans, OMM approaches embrace body unity principles and integrate palpation and OMT techniques into each patient’s prescription. Choices concerning OMT techniques and goals depend on each individual’s unique pain presentation, the suspected pathways involved in that presentation, and the regions diagnosed as containing somatic dysfunction.

A total review of diagnostic regimens and therapeutic options for persistent pain is beyond the scope of this article. Therefore, this article provides a concise overview of the OMM paradigm and introduces a general algorithm for pain management. Discussion of persistent pain management is limited to generalities that concern the integration of osteopathic principles and practice (OPP) in the use of OMT. Where pertinent, specific common chronic pain presentations are described as examples supporting the algorithm (Figure 1).

Algorithm

When patients present with chronic pain, especially pain that persists despite seemingly appropriate care, an algorithm (Figure 1) can suggest an approach for applying OPP and OMT. It is structured to identify and address frequently overlooked underlying etiologies included in an osteopathic differential diagnosis as well as the persistent tangible and holistic impact of pain on the body unit. Evaluation of the patient’s capability to

mount a homeostatic response and the underlying pathophysiologic status as interpreted by components of palpated somatic dysfunction guide the physician’s timing for implementing OMM treatment strategies.

Treatment protocols formulated from this algorithm incorporate the interdependence of all tenets of osteopathic medicine and result in an individually designed prescription to address each patient with persistent pain.

Structure-Function Considerations: Somatic Causes of Persistent Pain

Certain somatic findings have been consistently documented in various persistent pain conditions. Depending on the condition, the somatic dysfunction may be causative, reflexive, reactive, or perpetuating, or a combination. Thus, differential diagnoses and treatment considerations depend on both the specific region and underlying pathophysiology involved. The algorithm (Figure 1) contains generalities taking these factors and structure-function interrelationships into consideration.

An osteopathic palpatory examination often provides clues to the underlying mechanism of injury.² Such palpatory insights lead to further questions, examinations, and tests designed to identify structural factors associated with specific pain generators or those that may interfere with certain self-healing mechanisms. The findings lead the physician to explore functional demand issues associated with potential mechanisms of repeated injury or of cumulative microtrauma resulting from postural, habitual, or occupational ergonomic stresses.

One way to determine whether a given structure or somatic dysfunction is a primary cause of significant discomfort is to determine if it is a “pain generator” tissue. Comparing quality, anatomic location, and unique referral distribution with known sclerotomal, myotomal, and neurologic pain maps increases the chance of locating a pain generator. Often, such diagnoses are confirmed by an effective therapeutic response, even temporarily, to local anesthetic injection or manual correction of dysfunction.

Sclerotomal tissues (skeletal, arthro-dial, and ligamentous generators) typi-

cally mediate pain described as being “deep, dull, and toothache-like.” Sclerotomal pain patterns are frequently overlooked because they may project some distance from their pain generators and are infrequently taught to osteopathic physicians. The “Glossary of Osteopathic Terminology” contains sclerotomal maps relating spinal segmental levels to sclerotomal appendicular pain.⁹ Figure 2 illustrates segmentally related sclerotomal examples of ligamentous pain patterns commonly seen in low back pain (LBP). Patients with ligamentous pain generators often cannot find a comfortable position and are continuously shifting position, a presentation some refer to as “theatre cocktail party syndrome.”¹⁰

Myotomal (muscle) pain is also poorly localized, and the patient may describe symptoms located at a significant distance from the actual lesion site. Patients typically describe myotomal pain as “achy,” “stiff,” or “crampy,” and the pain often “grabs” them. Muscle dysfunction may include latent and active MTrPs¹¹ that when overused refer pain in recognizable patterns^{12,13} (Figure 3). Antigravity muscles harboring MTrPs are frequently hypertonic, whereas postural antagonist muscles demonstrate weakness to strength testing.¹⁰ Both are likely to contain taut bands demonstrating a local twitch response within the affected muscle during perpendicularly applied snapping palpatory examination. This phenomenon has been linked to the presence of segmentally related spinal reflexes (segmental facilitation).^{14,15}

Peripheral myotomal pain generators can originate in a single muscle. Alternatively, multiple peripheral inputs may establish more complex patterns of muscle dysfunction. Peripheral input can also produce a central imprint that persists as a central source of pain-modifying peripheral referral patterns (somatosomatic reflex). Common myotomal patterns also include those sharing the same radicular innervation (as occurs in discogenic disease) or those muscles contributing to the same general function (as in the myotatic unit pattern occurring in an overuse syndrome).

In structure-function considerations, osteopathic diagnostic palpation seeks to identify “any impaired or altered

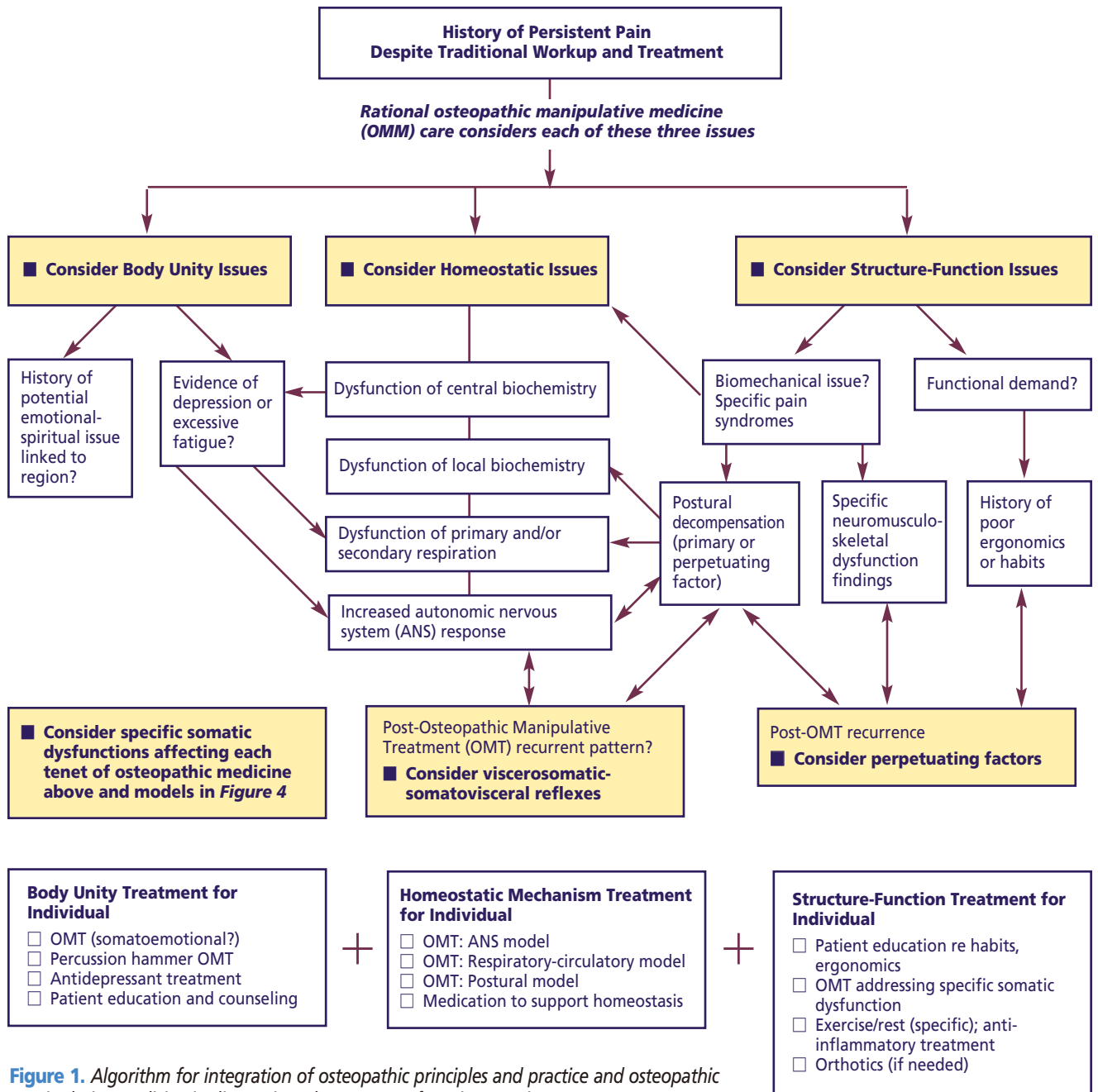


Figure 1. Algorithm for integration of osteopathic principles and practice and osteopathic manipulative medicine in diagnosis and treatment of persistent pain.

skeletal, arthrodial, and/or myofascial function” (viz “somatic dysfunction”⁹) adding to the nociceptive load and to recognize any related neural, vascular, and/or lymphatic elements that might complicate underlying pathophysiologic conditions. The palpatory characteristics sought include sensitivity to measured palpation, tissue texture change, asymmetry, and restricted motion (STAR characteristics). Tissue texture changes often provide the most important information concerning the underlying pathophysi-

ologic status of the periphery and the patient’s homeostatic response status.

Osteopathic manipulative treatment may be delivered to reduce or remove the identified somatic dysfunction or to attempt to modulate central and peripheral mechanisms involved in pain generation after weighing risk-to-benefit ratios associated with the resultant tentative diagnosis. Currently, palpated peripheral tissue texture characteristics have the greatest influence on the physician’s choice of an activating force for

the OMT. Sophistication should improve, however, as studies reveal how differing manual forces affect mechanoreceptors and mechanonociceptors in the tensegrity-integrin model, spinal cord gating mechanisms, and synaptic plasticity.¹⁶

■ Exemplars: Low Back Pain and Headaches—The two best-documented exemplars for the application of structure-function approaches in diagnosis and treatment of patients with persistent pain symptoms are LBP and cervicogenic headache. These two high-incidence con-

ditions are multifactorial, yet typically neuromusculoskeletal in origin, and they each have great propensity for disability. The evidence base is strongest in these two regions for interexaminer reliability of STAR objective findings in palpatory diagnosis,¹⁷ as well as for the measurable benefit from manual treatment in reducing pain and disability.¹⁸⁻²¹ Furthermore, studies specifically identify a specific role for OMT in LBP management.⁶

The role for manual modes of therapy such as OMT has been documented for acute, subacute, and chronic LBP¹⁸⁻²¹; in patients with LBP; specifically, spinal manipulation has effects similar to efficacious prescription NSAIDs and better effects than either physical therapy or home back exercises (or both).²¹ Positive long-term functional outcomes have also been demonstrated.²² Based on the literature, Mein²³ postulates that populations with subacute (secondary) and chronic (tertiary) LBP would benefit most from manipulative care rather than using more costly functional restoration, behavioral modification, and chronic pain management programs.

Using a structure-function approach, Greenman²⁴ examined 183 patients who had persistent LBP for an average of 31 months. With osteopathic palpation, he identified three or more of six

common diagnoses in 50% of this cohort (Table). Treatment with OMT to eliminate the identified somatic dysfunction resulted in nearly 75% of the dysfunctional group returning to work or to their activities of daily living. This author has also noted that undiagnosed somatic dysfunction, particularly “nonphysiologic dysfunctions” (such as pelvic shears), may result in years of persistent pain, either locally, or at distant sites linked through compensatory mechanisms or the development of MTrPs.^{25(pp463-512)} Dysfunction of one sacroiliac joint due to nonphysiologic pelvic shears greatly increases functional demand on the other sacroiliac joint and its stabilizing ligament.

Removal of myofascial somatic dysfunction, including MTrPs, has also been shown to be extremely effective in reducing or eliminating persistent LBP. Patients with trigger points displayed on the common composite MTrP charts shown in Figure 3 responded well to a wide range of treatment modalities, including various OMT techniques such as counterstrain, post-isometric relaxation muscle energy, and myofascial release variants.^{11,12} Manual correction of myofascial or articular somatic dysfunction also proves to be an effective adjunct regardless of whether pain also radiates into the lower extremity.^{12(pp168-185),26}

With recurrence of the same pattern of pain and somatic dysfunction after otherwise effective OMT, the clinician should consider dysfunctional homeostatic mechanisms and a range of perpetuating factors (including postural decompensation), as well as site-specific primary viscerosomatic reflexes (Figure 1).

Similarly, headache and neck pain have been extensively studied with respect to various somatic dysfunctions and manual approaches.^{21,27,28} For example, placebo-controlled, diagnostic investigations have documented the importance of cervical pain from dysfunction of the zygapophyseal joints in patients with chronic neck pain and headache after whiplash injury.²⁹

■ **Functional Demand and Somatic Perpetuating Factors**—Functional demand plays a precipitating or perpetuating role (or both) in various persistent pain disorders and recurrent somatic dysfunction. Increased functional demand on somatic structures underlies repetitive strain injuries ranging from carpal tunnel syndrome in keyboard operators and poultry-processing knife handlers³⁰ to those with L5-S1 isthmic spondylolisthesis who must stand for prolonged periods.^{10,14} Prolonged functional strain can lead to peripheral structural pathologic change coupled with

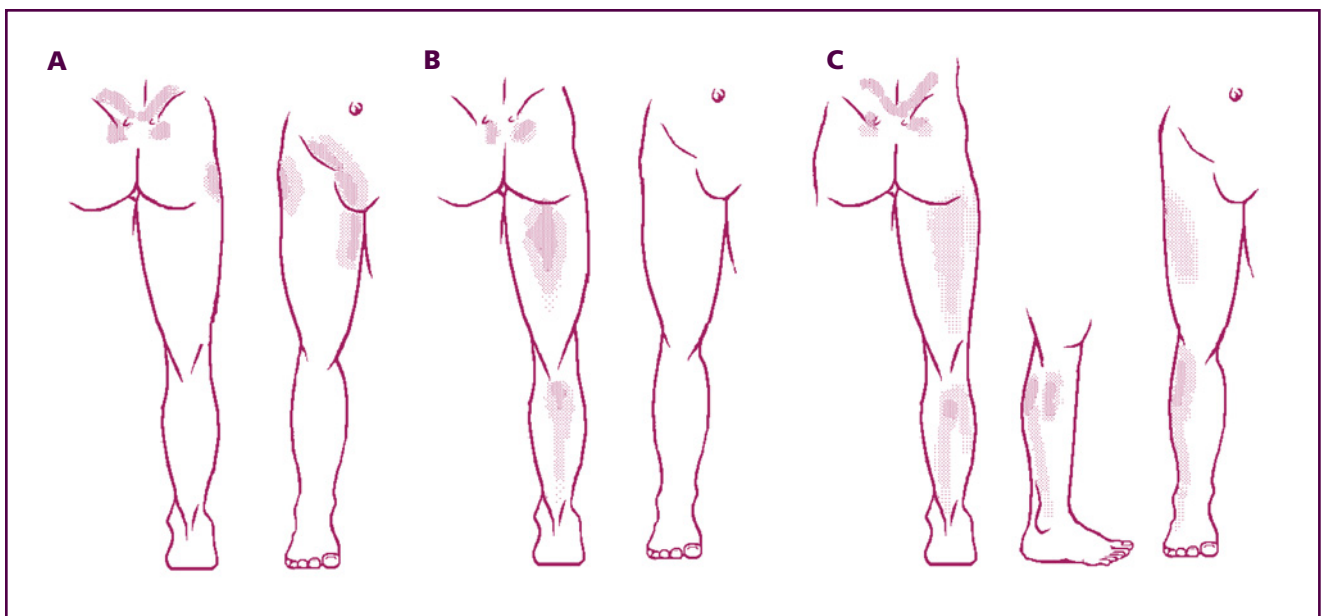


Figure 2. Sclerotomal pain referral regions from ligaments: (A) iliolumbar ligament, (B) sacrospinous and sacrotuberous ligaments, (C) posterior sacroiliac ligament.

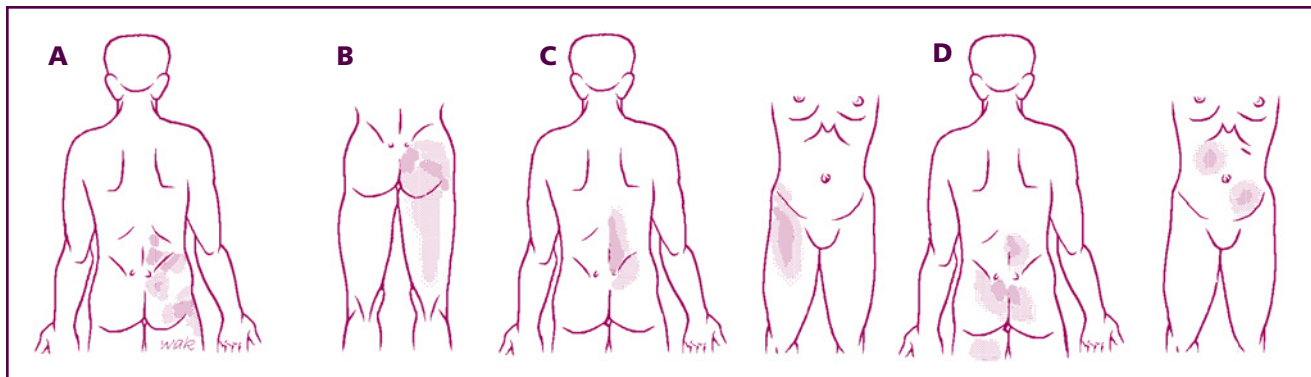


Figure 3. Myotomal pain referral regions from muscle trigger points: (A) quadratus lumborum, (B) piriformis, (C) iliopsoas, (D) rotatores and multifidi muscles.

central structural-functional modulations resulting from persistent pain patterns. Postural strain is among the most frequent of functional demand conditions that create persistent pain from musculoskeletal sources.

Inattention to ergonomics at work or play increases functional demand that can perpetuate chronic or recurrent pain. Thus, osteopathic physicians should review patients' occupational and personal biomechanical stressors as part of the history. By providing patient education, they can address persistent pain that derives from prolonged periods of activities such as holding a phone between the ear and shoulder, using a keyboard with improper seating relative to desk height, or falling asleep slumped forward in a recliner.

Effective pain management strategies aimed at treatment of peripheral pain generators will fail outright or secondary to recurrence of the original problem in the presence of excessive functional demand or other perpetuating factors. Unfortunately, prior failure may eliminate such strategies from their rightful place in the total treatment approach early on or cause the patient or the physician to dismiss them later in the program when the complicating postural stress or adjacent dysfunctions have been addressed.

Timing, tissue response, and multifactorial conditions within the body unit affect OMM treatment strategies prompted by applying the structure-func-

Table "Dirty Half-Dozen" Dysfunctions in Persistent Low Back Pain (PLBP)		
Somatic Dysfunction (SD) in PLBP	SD in PLBP, % (n=183)*	Key Palpatory Findings ^{††}
<input type="checkbox"/> Nonphysiologic pelvic SD (pubic shears)	76	Palpatory "step off" between pubic rami at the pubic symphysis; tenderness
<input type="checkbox"/> Nonphysiologic pelvic SD (sacroiliac shears)	15	(1) Iliac crest-ASIS-PSIS-ischial tuberosity all elevated on one side; or (2) dramatically inferior and slightly posterior inferolateral sacral angle on the side of the deep sacral sulcus
<input type="checkbox"/> Sacral nutation failure (including nonneutral and backward sacral torsion SD)	49	+ Sphinx test; + Spring test (particularly painful with type II L5 SD rotating in opposite direction from S1)
<input type="checkbox"/> Pelvic tilt/"Short-leg syndrome"/unlevel sacral base	63	Post-OMT + standing combined with – seated flexion tests; standing unlevel iliac crests and greater trochanters; possible functional scoliosis
<input type="checkbox"/> Muscle imbalance (including psoas syndrome)	90	Asymmetric muscle balance; psoatic or scoliotic posturing; + sharp tenderness over iliacus or psoas muscles
<input type="checkbox"/> Type II lumbar SD	85	Typically a single lumbar segment demonstrating F R _x S _x or E R _x S _x

* From Greenman PE. Syndromes of the lumbar spine, pelvis, and sacrum. *Phys Med Rehabil Clin North Am.* 1996;7:773–785.
[†] **Note:** In PLBP, patients had between three and six of these diagnoses; osteopathic manipulative treatment corrected 75%.
^{††} ASIS indicates anterior superior iliac spine; PSIS, posterior superior iliac spine; OMT, osteopathic manipulative treatment; F R_xS_x, E R_xS_x, where E indicates extension; R, rotation; S, side bending, and x, left or right.

tion principle. These conditions can both affect and be affected by other portions of the proposed algorithm (Figure 1). Physical examination of patients with persistent pain must go beyond identification of peripheral pain generators (especially from among the most commonly overlooked somatic sources) and screening for other perpetuating causes of pain: A

properly constructed OMM approach cannot focus on one principle alone.

Body Unity Considerations: Tangible Impact of Persistent Pain

While acute pain provides essential information for survival, persistent pain often results in anxiety, depression, and a reduction in the quality of life. Such body

unity (or mind-body-spirit) effects of persistent pain are frequently uncovered with careful, yet traditional, history and physical examination skills supplemented by palpation. Such findings provide diagnostic clues as well as targets of opportunity to reduce precipitating, perpetuating, and magnifying factors associated with persistent pain.

Discovery of a body unity dysfunction often shifts the traditional focus from simply identifying and removing an underlying organic disease (pain generator) to consideration of adding strategies designed to empower patients with chronic pain to reduce disability through modification of environmental and cognitive processes. Well-established behavioral interventions, including patient education, are commonly used in body unity approaches to chronic disabling pain conditions.

■ **Body-Mind Unity and Persistent Pain**—Chronic persistent pain is not simply acute pain that has lasted a long time. Positron emission tomography of patients with chronic neuropathic pain shows a shift of acute pain activity in the sensory cortex to regions such as the anterior cingulate gyrus associated with affective-motivational processing.³¹ For this reason, patients with chronic pain often attempt to describe their “suffering” and its impact rather than simply providing a location and quality description of their “pain.”

An osteopathic palpatory examination will also aid physicians in eliciting a complete chronic pain history by gaining the patient’s trust.² An integrated history is essential in determining the impact of pain on physical, mental, emotional, and spiritual functions unique to the individual. Understanding physical limitations, the most obvious manifestations of persistent pain, is part of a standard osteopathic medical education. Non-physical limitations in the mental and emotional realms, however, are less often articulated by patients and require greater recognition by physicians.

Osteopathic medicine’s consideration of mind-body connections in persistent pain largely parallels biopsychosocial models embraced by multidisciplinary pain clinics. In such models, chronic pain is a frequent, well-established

cause of depression³² with impact on both central and autonomic nervous systems. Furthermore, it is empirically recognized that physical pain may be temporally linked to anger, fear, or loss.^{33,34} An example of this link is a patient’s pain traumatically introduced during an accident in which there was time to hopelessly anticipate the other car’s approach. Both fascial dysfunction and emotions associated with the injury serve to anchor such pain in these patients. Such persons may require additional counseling for the subsequently expressed nonphysical factors.

Conversely, hands-on management of somatic dysfunction offers a unique and often effective access to these body-mind connections. Effects of OMT are occasionally dramatic, as in the catharsis effect of certain somatoemotional releases. Treatment of somatic dysfunction often offers an opportunity to open discussion and seek coping strategies to reduce patients’ mental, spiritual, and emotional pain.

Persistent Pain, Somatic Dysfunction, and Homeostatic Responses

Various homeostatic coping and regulating mechanisms influence physiologic processes responsible for maintaining pain.³⁵⁻³⁷ Homeostasis may be altered through focused psychosympathetic, biochemical, or neuroendocrine mechanisms affecting specific structures or target receptors, or both. Conversely, an integrated series of homeostatic mechanisms may provide for panstructural biomechanical changes such as shifting weight-bearing responsibilities away from painful sites. The process creates easily recognizable patterns associated with certain pain syndromes.

Because OMT has long been noted to have an independent positive effect on certain autonomic, respiratory, circulatory, postural, and neuroendocrine mechanisms, it is rational to consider that influencing these mechanisms may positively impact pain modulation, as well (Figure 4).

■ **Autonomic System Homeostasis: Pain and Osteopathic Manipulative Medicine**—The importance of sympathetic nervous system involvement in

certain forms of neuropathic pain led to taxonomy distinguishing sympathetically maintained pain (SMP) from sympathetically independent pain (SIP)^{38,39}. SMP, defined as “pain attributable to sympathetic efferent function in peripheral tissues,”³⁹ is, by definition, abolished when the sympathetic supply to the painful region is modulated. In contrast, SIP is not dependent on sympathetic efferent function and thus not affected by techniques affecting this system.

SMP/SIP taxonomy dissociates the presence of pain from gross signs of sympathetic dysregulation (eg, altered temperature, excessive sweating, trophic changes), so that such obvious evidence of abnormal sympathetic activity need not accompany SMP. Thus, while SMP syndromes such as causalgia and reflex sympathetic dystrophy are often relieved by sympathetic ganglion blocks,⁴⁰ persistent pain with lesser SMP may be addressed with OMT techniques designed to treat somatic dysfunction and modulate hypersympathetic activity.⁴¹

Modulation of hypersympathetia has been linked to pain reduction, enhanced healing rates, and improvement in a variety of visceral and somatic functions. It is considered to be a hallmark effect of the OMM approach and warrants consideration in chronic pain conditions.

■ **Respiratory-Circulatory Homeostasis Role in Pain**—Controlled breathing and pain relief have long been linked. The ancient Chinese prescribed controlled breathing for reducing arthritic pain; lay and professional persons have used it to reduce pain of labor and delivery. Even beyond the body-mind effect of focused respiration as used in meditation and lowering blood pressure, heart rate, and pain perception, the respiratory-circulatory model popularized by Zink⁴² is characterized by reduction of edema and associated peripheral biochemical molecules linked to nociception.

The treatment goals associated with the Zink respiratory-circulatory model are traditionally administered in the following sequence.

□ **Opening fascial pathways:** Somatic dysfunction associated with fascial restriction to fluid flow is corrected with

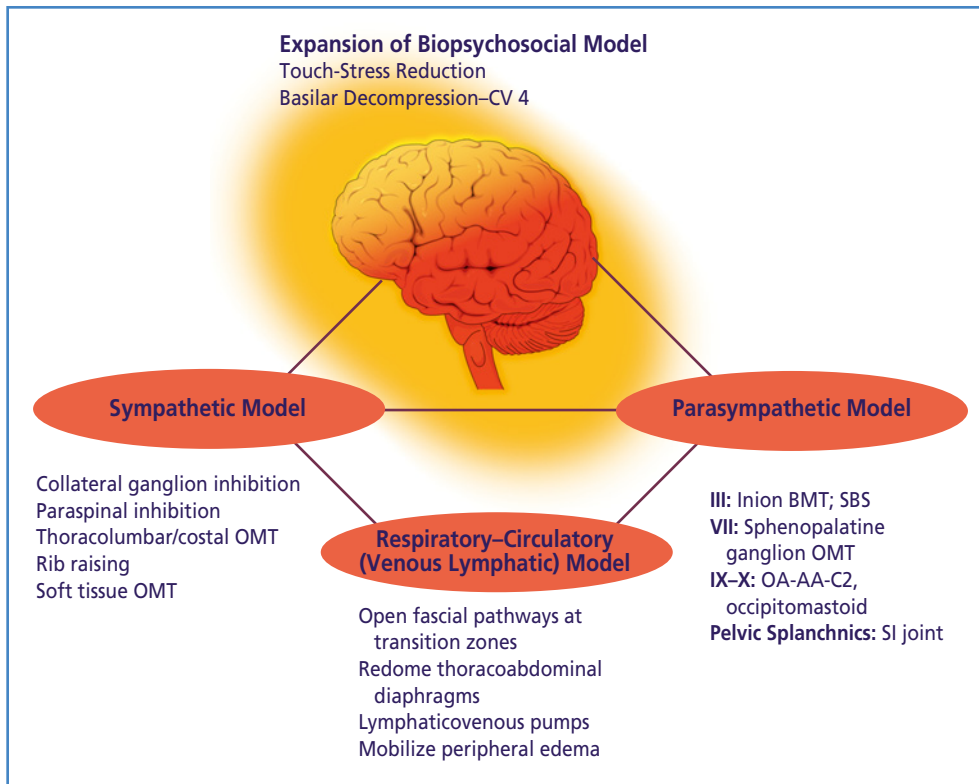


Figure 4. Sample osteopathic manipulative treatment (OMT) protocols for enhancing homeostatic responses. CV-4 indicates compression of the fourth vertebra; BMT, balanced membranous tension; SBS, sphenobasilar synchondrosis; IX-X, glossopharyngeal and vagus cranial nerves; OA-AA-C2, occipitoatlantal, atlantoaxial, and second cervical vertebral units; SI joint, sacroiliac joint.

sometimes an appropriate orthotic regimen.^{14(pp603-632)} The Zink respiratory-circulatory approach⁴² described earlier is also applicable in preparing the tissues for postural homeostasis because of the body unit's tendency to compensate for postural imbalance at the regional transition zones.

OMT at the body's four regional transition zones;

□ **Maximizing primary-secondary respiration:** Effective, deep synchronized respiration is sought using a variety of OMT techniques, including doming of the thoracoabdominopelvic diaphragms;

□ **Augmenting lymphaticovenous drainage:** Homeostatic OMT is applied (often using one or more rhythmic lymphaticovenous pumps) to effect pressure changes between the thorax and adjacent regions. Recent literature suggests that such rhythmic motion may also have an effect on release of the homeostatic molecule, endothelial nitric oxide synthetase^{27,43};

□ **Enhancing cellular level health:** Local tissue techniques (such as effleurage) are used to mobilize local edema.

The act of deep breathing creates obvious motion in 136 joints and is palpable into all body tissues. It is a continuous motion with active and passive components. Through tensegrity relationships, the patient or physician can focus deep breathing to remove motion restrictions or engage neuromuscular reflexes to achieve tightening or relaxation of selected tissues.⁴⁴

■ **Postural Homeostasis in Pain and Dysfunction**—Chronic or recurrent pain syndromes have been linked to conditions predisposing to postural stress (eg, lower extremity asymmetry, unlevel sacral base, scoliotic changes, altered lordotic-kyphotic curves, unlevel cranial base, postural muscle imbalance). Travell and Simons¹² note that postural decompensation is the most common precipitating and perpetuating cause of MTrPs. These MTrPs are themselves implicated in many chronic pain syndromes ranging from LBP and headaches to carpal tunnel syndrome, temporomandibular joint dysfunction, and pain perceived as angina.¹³

Pain associated with postural stress and strain can be sclerotomal (postural ligaments) or myotomal (postural muscles). It can also have a significant role in radiculopathies associated with osteoarthritic and discogenic conditions.⁴⁵ Irvin⁴⁶ demonstrated that chronic complaints throughout the body could be attributed to an unlevel sacral base and that reestablishing postural homeostasis removed most of these symptoms.

The OMM approach to postural care is described thoroughly in *Foundations for Osteopathic Medicine* and consists of patient education, OMT, exercise, and

Comment

Persistent nonmalignant pain is not a single entity. It has many different causes and manifestations, each with varied characteristics and names. Osteopathic manipulative medicine employs a history and physical examination designed to reveal any previously unidentified pain generator or underlying cause for persistence of pain. In addition, OMM screens for signs of depression or other significant non-physical links contributing to pain. Based on the OMM examination, physicians can develop an individualized osteopathic prescription to address these findings with the goal of decreasing pain and empowering patients to reduce its impact on their quality of life.

In addition to appropriate strategies to manage the symptom of pain, the OMM algorithm incorporates osteopathic principles to identify and address a variety of host factors directed toward the underlying cause and the tangible impact of persistent pain on the patient. These principles provide a framework for patient education to foster compliance built on understanding complex interrelationships.

Each osteopathic prescription seeks to discover and incorporate the factors

needed to address the individual's unique response to his or her pain. The emphasis in treating patients with persistent non-malignant pain should be on improving function, decreasing peripheral nociception and central facilitation, and empowering the patient to move forward in resuming their activities of daily living.

Applying osteopathic principles as part of an effective treatment strategy for patients with chronic pain results in an individualized care plan combining non-drug treatment strategies with pharmacotherapy. Patient education included in the comprehensive plan helps to improve quality of life and break the vicious cycle seen in the pathophysiology of persistent pain.

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