

# The Role of Body Posture In Musculoskeletal Pain Syndromes

Better pain relief may be achieved if patients do exercises and use devices that elongate the spine and promote normal posture.

By Howard W. Makofsky, PT, DHSc, OCS and [Leonard B. Goldstein, DDS, PhD](#) [1]

Editor's Note: New postural devices can be found for the neck, spine, hips, knees, ankles, and feet. The Internet offers numerous commercial offerings of postural products that help the patient and practitioner select an appropriate device. The authors of this paper are particularly enthused about devices that stretch or elongate the spine, since many if not most painful spine conditions result from, or are aggravated by, contraction or shrinkage of the spine components. This compression puts pressure on nerves, discs, or other anatomic structures. At this time, there are essentially no controlled studies comparing devices against no devices or comparing one device against another. For this reason, practitioners must develop their own posture recommendations and select commercial postural devices on anecdotal reports and clinical experience.[Forest Tennant, MD, DrPH](#) [2]

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The observation of the influence of postural mechanics on physiologic functions and pain has led researchers to conclude that posture plays a significant role in the development of pain and is critical to pain management. Spinal pain, headache, mood, blood pressure, pulse, and lung capacity are among the functions most easily influenced by posture, according to Lennon et al.<sup>1</sup> The most significant influences of posture are upon respiration, oxygenation, and sympathetic function, which is a major component of perceived pain. Ultimately, it appears that homeostasis and autonomic regulation are intimately connected with posture. Many symptoms, including pain, may be moderated or eliminated by improved posture.<sup>1</sup> In summary, body posture in pain management is important. The authors will review non-invasive ways to improve posture.

## Review of the Literature

According to Peterson Kendall et al, good posture is that state of muscular and skeletal balance that protects the supporting structures of the body against injury or progressive deformity.<sup>2</sup> Conversely, they describe poor posture as a faulty relationship of body parts resulting in increased strain and less efficient balance of the body over its base of support.

Although some authors question the association between postural misalignment and musculoskeletal pain,<sup>3,4</sup> there are a number of clinical studies suggesting that such a correlation exists.<sup>5-14</sup> In fact, the scientific literature points to a strong relationship between faulty body posture and tension-type headaches,<sup>5,6</sup> temporomandibular disorders,<sup>7-9</sup> shoulder impingement,<sup>10-14</sup> as well as a likely connection between poor posture (eg, forward head/rounded shoulders) and respiratory function,<sup>15,16</sup> back pain,<sup>17,18</sup> impaired balance,<sup>19</sup> fibromyalgia,<sup>20</sup> and osteoporotic spinal deformity.<sup>21</sup> Clearly, the review of the literature concludes that pain management can be enhanced with correct posture.

## Physiology of Posture

Human posture is the result of positioning and orientation of the body and limbs in equilibrium with motion and gravitation. It has been demonstrated that respiration, head and neck position, and mood states can modify posture. Postural adjustments consisting of slight sways include visual, vestibular, and somatosensory inputs integrated in a complex regulatory system. The correct erect position of the head is maintained by a balance between craniocervical bones and myofascial structures. Finally, the upper cervical spine is the mediator between the head and the trunk, and forms an anatomically and

functionally interrelated system.<sup>28-30</sup>

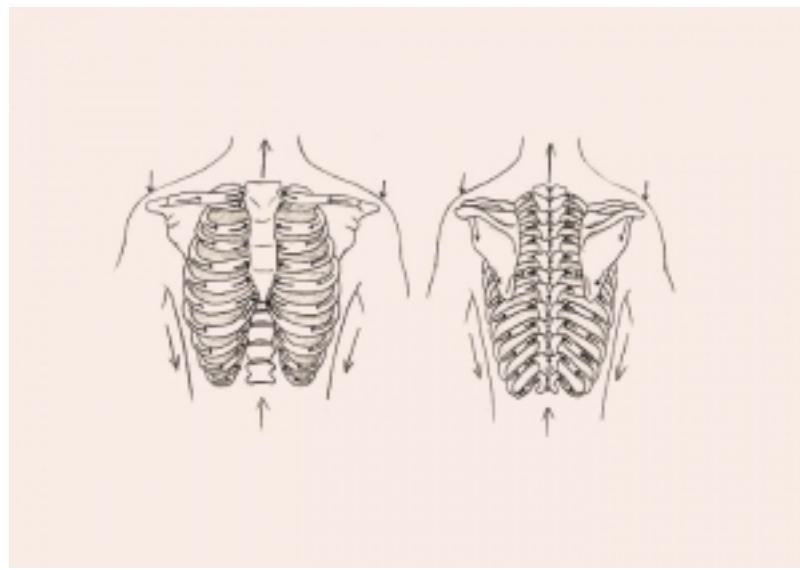
The reality is, however, that over the span of a lifetime body posture often shifts from ideal alignment to one that is compressed, inefficient, and symptom-producing (eg, headaches, temporomandibular pain, etc). The relationship between ideal alignment and spinal elongation (ie, upward force generation) is a critical one for pain relief, particularly if there are pain generators in the cervical spine or upper torso.

## New Emphasis on Posture Devices

Clinical observations led the authors to believe that a high percentage of pain patients have poor posture. For example, patients in pain don't stand up straight when they walk, and they slouch when they sit. The realization that correct posture is critical for pain management has brought forth a plethora of new devices to help correct and maintain proper posture. It is important to note that the term "posture" is basically replacing the terms "brace" and "splint," since most posture devices not only perform a brace or splint-like function, they also strive to align a body component to its natural, postural state.

## Spinal Elongation and Upward Postural Force Generation

Spinal traction is well known to practitioners. It is a form of spine elongation in that its therapeutic thrust is to stretch and elongate the spine to relieve pressure on discs and nerves. The authors believe the theory of spinal traction, which is traditionally a hospital procedure, can and should be adopted for ambulatory use. Few observers and clinicians have appreciated that spinal stretching, lengthening, and elongation may have a place in the ambulatory clinic.<sup>22,23</sup> For example, previous reports state that posture correction therapy most often deals with forward head/rounded shoulders,<sup>24,25</sup> excessive thoracic kyphosis,<sup>2,26</sup> increased lumbar lordosis,<sup>2,26</sup> and swayback.<sup>2,26</sup> These common postural deformities need to be addressed in order to restore optimal alignment, but spinal elongation along a vertical axis has not previously been addressed in a systematic way. It is true that such instructions as, "stand up straight" or "think tall" are often given, but the biomechanics of this upward lengthening process has conspicuously not been administered or mentioned in the scientific literature.



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[3]Figure 1. Spinal "corkscrew" principle, anterior and posterior views. Reproduced with permission from Dr. Makofsky.

## How It Works

The authors have been experimenting with devices that purport to elongate and put the spine in a normal physiologic posture.\* This physiologic procedure is referred to as the spinal "corkscrew" principle.<sup>24</sup> It is an attempt at understanding the physiological mechanism of spinal elongation. Like a wing-style corkscrew as the shoulders are forced down, the spine is "jacked" up. It is postulated that the lower trapezius muscles, working in reverse action, are the "engines" that drive the spine superiorly and thus provide the force behind "vertebral spine lifting". The act of simply "standing up straight" also generates significant upward force compared to baseline. The result is that patients become functionally taller.<sup>27</sup> This perception by the patient is not only emotionally "uplifting," but also decompresses the vertebral column rendering body posture more graceful and fluid. African women can teach themselves to have upward pressure on their cervical spine, which allows them to carry heavy loads on top of their head. We believe elongation of the spine by use of a special device or brace relieves pressure on nerves, discs, and other structures while the patient is ambulatory. To date, we believe we see pain reduction, and hopefully use of a "vertical uplifting spinal device" (VUSD) will produce short and long-term pain relief.



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[4]Figure 2. Lower trapezius vertebral lifting mechanism. Reproduced with permission from Dr. Makofsky.

## Conclusion

Attempts to have pain patients practice normal posture is therapeutic and will reduce pain. Recognition that proper posture may give pain relief has brought forth a plethora of commercial products designed to correct posture at an anatomical section of the body such as lumbar spine, pelvis, knees, shoulders, neck, and feet. Neck and upper spine disease are well known clinical problems characterized by severe pain and poor posture.

Our clinical experience with some of the new postural devices has compelled us to highly support postural devices that lower the shoulders and elongate or stretch the upper spine. Just as with hospital-bed traction, these VUSDs take pressure off compressed nerves and degenerated discs while the patient is ambulatory. We conclude that pain practitioners should seek out and experiment with new devices

that elongate the spine while the patient is ambulatory.

**Note:** The authors have made their observations using a commercial vertical uplifting spinal device called PostureJac. Dr. Makofsky has disclosed that he has financial interest in SomatoCentric Systems, Inc., makers of the PostureJac. Practical Pain Management neither endorses or recommends this or other commercial products and publishes this article based on referenced scientific reports and a rational theory. Physicians must decide for themselves on the merit of all commercial products including the one noted here.

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