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The Mechanism of the Chiropractic Spinal Adjustment/Manipulation: Chiropractic vs. Physical Therapy for Spine Part 5 of a 5 Part Series

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The Mechanism of the Chiropractic Spinal Adjustment/Manipulation: Chiropractic vs. Physical Therapy for Spine

Part 5 of a 5 Part Series

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A report on the scientific literature

According to the Cleveland Clinic (2017):

The Cleveland Clinic Spine Care Path is a process-based tool designed for integration in the electronic medical record (EMR) to guide clinical work flow and help providers make evidence-based guidelines operational.

The care path was developed by Cleveland Clinic's Center for Spine Health with input from Department of Pain Management staff like Dr. Berenger. One goal was to match appropriate treatments and providers to patients at various points along the care continuum for low back pain.

"We know acute back pain is common and often resolves with simple therapy or even no therapy," Dr. Berenger says. "For patients without red flags, imaging is rarely required."

These patients may be best served through prompt access to care from physical therapists or nurse practitioners as entry-level providers. When pain persists beyond four to six weeks, the care path defines when referral to spine or pain specialists, spine surgeons or behavioral health providers is indicated. (<https://consultqd.clevelandclinic.org/2014/11/sticking-with-proven-practices-for-low-back-pain/>)

According to the Mayo Clinic Staff (2017):

Most acute back pain gets better with a few weeks of home treatment. Over-the-counter pain relievers and the use of heat ice might be all you need. Bed rest isn't recommended.

Continue your activities as much as you can tolerate. Try light activity, such as walking and activities of daily living. Stop activity that increases pain, but don't avoid activity out of fear of pain. If home treatments aren't working after several weeks, your doctor might suggest stronger medications or other therapies. (<http://www.mayoclinic.org/diseases-conditions/back-pain/basics/treatment/con-20020797>)

The Mayo Clinic Staff (2017) continued:

Physical therapy is the cornerstone of back pain treatment. A physical therapist can apply a variety of treatments, such as heat, ultrasound, electrical stimulation and muscle-release techniques, to your back muscles and soft tissues to reduce pain. As pain improves, the therapist can teach you exercises that can increase your flexibility, strengthen your back and

abdominal muscles, and improve your posture. Regular use of these techniques can help prevent pain from returning. (<http://www.mayoclinic.org/diseases-conditions/back-pain/basics/treatment/con-20020797>)

The above 2 scenarios are consistent with contemporary care paths for medicine regarding back pain. High velocity-low amplitude chiropractic spinal adjustments are not part of any medical institution's care plan (to the current knowledge of the authors) despite the following compelling literature.

Coronado et al. (2012) reported:

Reductions in pain sensitivity, or hypoalgesia, following SMT [defined by the author as high velocity-low amplitude adjustment or a spinal adjustment] may be indicative of a mechanism related to the modulation of afferent input or central nervous system processing of pain. (p. 752)

Coronado et al. (2012) further asked the question:

...was whether SMT [defined by the author as high velocity-low amplitude or a spinal adjustment] elicits a general response on pain sensitivity or whether the response is specific to the area where SMT is applied. For example, changes in pain sensitivity over the cervical facets following a cervical spine SMT would indicate a local and specific effect while changes in pain sensitivity in the lumbar facets following a cervical spine SMT would suggest a general effect. We observed a favorable change for increased PPT [pressure pain threshold] when measured at remote anatomical sites and a similar, but non-significant change at local anatomical sites. These findings lend support to a possible general effect of SMT beyond the effect expected at the local region of SMT application. (p. 762)

Reed, Pickar, Sozio, and Long (2014) reported:

...forms of manual therapy have been clinically shown to increase mechanical pressure pain thresholds (i.e., decrease sensitivity) in both symptomatic and asymptomatic subjects. Cervical spinal manipulation has been shown to result in unilateral as well as bilateral mechanical hypoalgesia. Compared with no manual therapy, oscillatory spinal manual therapy at T12 and L4 produced significantly higher paraspinal pain thresholds at T6, L1, and L3 in individuals with rheumatoid arthritis. The immediate and widespread hypoalgesia associated with manual therapy treatments has been attributed to alterations in peripheral and/or central pain processing including activation of descending pain inhibitory systems.

Increasing evidence from animal models suggests that manual therapy activates the central nervous system and, in so doing, affects areas well beyond those being treated. (p. 277)

With regards to manual therapy versus physical therapy, this is where the phrase, "caveat emperor" should be used as the concept is misleading. Groeneweg et al. (2017) compared manual and physical therapies, recruiting 17 manual therapists and 27 physical therapists. The training of the manual therapists was from Manual Therapy University and were predominantly physical therapists who spent 3 years studying manual therapy.

Groeneweg et al. (2017) reported:

The manual therapist performs per protocol repeated passive joint movements with low velocity and intensity and high accuracy in different positions of the patient (sitting, supine and side-lying). The rhythm of the movements is slow (approximately 30 cycles/min) and the movements are repeated about six times. Treatment is in general painless. Passive joint movements are performed in a combination of rolling and sliding, or rocking and gliding (or swinging and sliding) in the joint, based on the arthrokinematic and osteokinematic principles of intra-articular movements. Passive movements are performed over the entire range of motion within the physiological range of motion of joints, whereby the curvature of the articular surface is followed, with manual forces directed to the joints/specific spinal level. Physiological joint range of motion is carefully respected. Traction, oscillation and high-velocity movements are not applied. In all patients, based on the assessment protocols, all joints of the spine, pelvis and extremities are mobilized in specific directions. (p. 3)

Groeneweg et al. (2017) also stated:

This pragmatic RCT [randomized control trial] in 181 patients with non-specific neck pain (>2 weeks and <1 year) found statistically significant overall differences in primary and secondary outcomes between the MTU group and PT group. The results at 7 weeks and 1 year showed no statistically and clinically significant differences. The assumption was that MTU

was more effective based on the theoretical principles of mobilization of the chain of skeletal and movement-related joint functions of the spine, pelvis and extremities, and preferred movement pattern in the execution of a task or action by an individual, but that was not confirmed compared with standard care (PT). (pg. 8)

The above article strongly confirms why language is important when describing the chiropractic spinal adjustment. Too many “lump together” all manual therapies and claim the effectiveness, or lack thereof, based on studies as the one above confirms. The article compared physical therapy to physical therapists who have gone for advanced education in what they already do in low-amplitude repetitive movements using “arthrokinematic and osteokinematic principles of intra-articular movements” meaning very specific per the anatomy. The outcome confirmed there is no difference between manual therapy and physical therapy because they are the same according to the description in the research. However, these therapies do not provide what chiropractic offers, although many hastily consider manual therapy and chiropractic care to be the same. Substance P is perhaps the most compelling evidence of why a chiropractic spinal adjustment should be considered the “first choice” for spinal care.

Evans (2002) reported:

In a series of studies, Brennan et al. investigated the effect of spinal HVLAT manipulation causing cavitation (“sufficient to produce an auditory release or palpable joint movement”) on cells of the immune system. They found that a single manipulation to either the thoracic or lumbar spine resulted in a short-term priming of polymorphonuclear neutrophils to respond to an in vitro particulate challenge with an enhanced respiratory burst (RB) as measured by chemiluminescence in subjects with and without symptoms. The enhanced RB was accompanied by a two-fold rise in plasma levels of the neuropeptide substance P (SP).

SP is an 11-amino acid polypeptide and is one of a group of neuropeptides known as tachykinins. These are peptides that are produced in the dorsal root ganglion (DRG) and released by the slow-conducting, unmyelinated C-polymodal nociceptors in a process known as an “axon reflex.” They are released into peripheral tissues from the peripheral terminals of the C-fibers, modulating the inflammatory process by “neurogenic inflammation.” They are also released from the central terminals of the nociceptors into the dorsal horn of the spinal cord, where they modulate pain processing and spinal cord reflex activity.

This neurophysiologic effect of spinal HVLAT manipulation seems to be force threshold-dependent. The threshold was found to lie somewhere between 450N and 500N for the thoracic spine and 400N for the lumbar spine. When compared with data from biomechanical studies of spinal manipulation, these forces would be sufficient to cause cavitation. The “SF studies used “sham manipulation” as a control, consisting of a “low-velocity light-force thrust to the selected segment.” rather like a mobilization. This illustrates that zygapophyseal HVLAT manipulations that cause cavitation produce physiological effects, not demonstrable by electromyography, that are totally different from effects created by zygapophyseal manipulations that do not cause cavitation. (p. 255-256)

According to Hartford-Wright, Lewis, Vink and Ghabriel (2014):

Substance P (SP) is a neuropeptide released from the endings of sensory nerve fibers and preferentially binds to the NK1 receptor. It has a widespread distribution throughout the nervous system, where it is implicated in a variety of functions including neurogenic inflammation, nausea, depression and pain transmission as well as in a number of neurological diseases, including CNS tumors. (p. 85)

Low velocity manipulation, no matter how well it follows “arthrokinematic and osteokinematic principles of intra-articular movements,” will not effectuate the release of Substance P, only a chiropractic spinal adjustment with cavitation will do that. When considering the results of a chiropractic spinal adjustment, disability is a critical indicator with regards to the effectiveness of treatment outcomes.

Cifuentes, Willets and Wasiak (2011) compared different treatments of recurrent or chronic low back pain. They considered any condition recurrent or chronic if there was a recurrent disability after a 15-day absence and return to disability. Anyone with less than a 15-day absence was excluded from the study. Please note that we kept disability outcomes for all reported treatment and do not limit this to physical therapy. However, the statistic for physical therapy is significant.

The Cifuentes, Willets and Wasiak (2011) study concluded that chiropractic care during the health maintenance care period resulted in:

The study concluded that chiropractic care during the disability episode resulted in:

24% Decrease in disability duration of first episode compared to physical therapy

250% Decrease in disability duration of first episode compared to medical physician's care

5.9% Decrease in opioid (narcotic) use during maintenance care with physical therapy care

30.3% Decrease in opioid (narcotic) use during maintenance care with medical physician's care

32% Decrease in average weekly cost of medical expenses during disability episode compared to physical therapy care

21% Decrease in average weekly cost of medical expenses during disability episode compared to medical physician's care

Cifuentes et al. (2011) started by stating, "Given that chiropractors are proponents of health maintenance care...patients with work-related LBP [low back pain] who are treated by chiropractors would have a lower risk of recurrent disability because that specific approach would be used" (p. 396). The authors concluded by stating, "After controlling for demographic factors and multiple severity indicators, patients suffering nonspecific work-related LBP who received health services mostly or only from a chiropractor had a lower risk of recurrent disability than the risk of any other provider type" (Cifuentes et al., 2011, p. 404).

Given that physical therapy has been the primary portal for mechanical spine issues (not fractures, tumors or infection) coupled with the contemporary opiate addiction and mortality issues, a different path must be sought as a matter of public safety. The on avenue for both medical primary care providers and specialists other than surgery is pain management in the form of opiates an that doesn't resolve any issues, it only creates new addiction issues. Mechanical spine pain is one of the most common diagnoses.

According to Block (2014):

Over 100 million Americans experience chronic pain with common painful conditions including back pain, neck pain, headaches/migraines, and arthritis, in addition to other painful conditions such as diabetic peripheral neuropathy, etc... In large study in 2010, 30.7% of over 27,000 U.S. respondents reported an experience of chronic, recurrent pain of at least a month duration. Half of the respondents with chronic pain noted daily symptoms, with 32% characterizing their pain as severe (≥ 7 on a scale ranging from 0 to 10). Chronic pain has a broad impact on emotional well-being and health-related quality of life, sleep quality, and social/recreational function. (p. 1)

Mafi, McCarthy and Davis (2013) reported on medical and physical therapy back pain treatment from 1999 through 2010 representing 440,000,000 visits and revealed an increase of opiates from 19% to 29% for low back pain with the continued referral to physical therapy remaining constant. In addition, the costs for managing low back pain patients (not correcting anything, just managing it) has reached \$106,000,000,000 (\$86,000,000,000 in health care costs and \$20,000,000,000 in lost productivity).

Mafi, McCarthy and Davis (2013) stated:

Moreover, spending for these conditions has increased more rapidly than overall health expenditures from 1997 to 2005... In this context, we used nationally representative data on outpatient visits to physicians to evaluate trends in use of diagnostic imaging, physical therapy, referrals to other physicians, and use of medications during the 12-year period from January 1 1999, through December 26, 2010. We hypothesized that with the additional guidelines released during this period, use of recommended treatments would increase and use of non-recommended treatments would decrease. (p. 1574)

The above paragraph has accurately described the problem with allopathic "politics" and "care-paths." Despite self-reported overwhelming evidence where there were 440,000,000 visits and \$106,000,000,000 in failed expenditures, they hypothesized that increased utilization for recommended treatment would increase. The recommended treatment, as outlined in the opening two comments of this article, doesn't work and physical therapy is a constant verifying a "perpetually failed pathway" for mechanical spine pain.

Chiropractic offers an evidence-based approach in developing an "outcome based" care path for mechanical spine pain. Although this article discusses pain, chiropractic offers more than simply pain management, however this discussion is limited to mechanical spine pain. Therefore, with chiropractic as the "first option" or "Primary Spine Care" focusing on the biomechanical pathologic instability, the underlying cause of the pain can be addressed, leaving no further need to manage an issue that has been simply fixed.

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