Middletown Spine and Injury Sheely Chiropractic

Middletown Spine and Injury
A division of Dr. Robert B. Sheely Inc.
1002 N. University Blvd
Middletown, Ohio 45042
Clinic Director -Robert B Sheely, DC, FICC, FIACA
Ph: 513-217-7035 Fax: 513-318-4973
drrob@sheelychiro.com www.sheelychiro.com

A Comparative Research Report: Chiropractic Care vs. Pain Medication for Low Back Pain Treatment

Robert B. Sheely, DC, FICC, FIACA

1. Introduction

Low back pain (LBP) is a pervasive global health issue, representing a leading cause of disability worldwide and imposing a significant socioeconomic burden through healthcare costs and lost productivity. The management of LBP is multifaceted, with patients and clinicians navigating a complex landscape of therapeutic options ranging from conservative, non-pharmacological interventions to potent pharmaceutical agents. Among the most common and debated approaches are chiropractic care, a form of manual therapy centered on spinal manipulation, and the use of pain medication, which includes a wide spectrum of drugs from over-the-counter analgesics to prescription opioids.

Historically, these two modalities have occupied different spheres within the healthcare system. Pain medication, particularly nonsteroidal anti-inflammatory drugs (NSAIDs) and analgesics, has been a cornerstone of conventional medical management, offering rapid symptom relief. Chiropractic care, once considered an alternative approach, has gained increasing acceptance and integration into mainstream healthcare, supported by a growing body of research and clinical practice guidelines. This has led to a critical juncture where a direct, evidence-based comparison of these treatments is not only relevant but essential for informed clinical decision-making.

This research report aims to provide a comprehensive, evidence-based comparison of chiropractic care and pain medication for the treatment of low back pain. The analysis will delve into the mechanistic underpinnings, clinical effectiveness, safety profiles, long-term outcomes, and patient-centered considerations associated with each approach. By synthesizing evidence from randomized controlled trials, systematic reviews, and clinical guidelines, this report will evaluate the relative benefits and limitations of both interventions. The objective is to equip healthcare professionals, patients, and researchers with a clear, nuanced understanding of where each treatment fits within the LBP care continuum, moving beyond a simplistic "either/or" debate to foster a more integrated and personalized approach to managing this prevalent and debilitating condition.

2. Defining the Interventions: Mechanisms and Philosophies

To effectively compare chiropractic care and pain medication, it is crucial to first understand their distinct therapeutic philosophies, primary mechanisms of action, and the scope of each intervention. While both aim to alleviate LBP, they do so through fundamentally different pathways.

2.1 Chiropractic Care: A Biomechanical and Neurophysiological Approach

Chiropractic care is a healthcare profession focused on the diagnosis, treatment, and prevention of neuromusculoskeletal disorders, with a primary emphasis on the spine. The central therapeutic procedure used by chiropractors is spinal manipulative therapy (SMT) [1]. However, a comprehensive chiropractic treatment plan often extends beyond SMT to include a multi-modal approach encompassing patient education, ergonomic advice, therapeutic exercises, and lifestyle counseling [2].

The underlying philosophy of chiropractic care is rooted in the principle that proper structure is essential for proper function. It posits that biomechanical dysfunctions in the spine, often termed "subluxations" or "joint restrictions," can lead to pain, disability, and adverse neurophysiological effects. The primary mechanism of SMT is believed to be twofold:

1. **Biomechanical Effects:** SMT involves the application of controlled, high-velocity, low-amplitude thrusts to specific spinal joints. This is intended to restore normal joint mobility, reduce physical stress on sensitive tissues, and improve the overall biomechanics of the spinal column.
2. **Neurophysiological Effects:** Beyond mechanical correction, SMT is thought to influence the nervous system. Theories suggest it can modulate pain perception by stimulating mechanoreceptors (pain gate theory), trigger descending inhibitory pain pathways in the central nervous system, and reduce nerve root irritation. This neurophysiological impact may explain its effects on pain and muscle function that extend beyond the immediate site of manipulation.

This approach is inherently active and patient-centric, aiming not just to alleviate current symptoms but also to improve long-term spinal health and empower patients with self-management strategies.

2.2 Pain Medication: A Pharmacological Approach to Symptom Management

Pain medication for LBP encompasses a broad and diverse class of pharmacological agents designed to interrupt pain signaling pathways or reduce inflammation. Unlike the structural focus of chiropractic care, this approach is primarily biochemical and symptomatic. The main categories of medications used for LBP include:

1. **Nonsteroidal Anti-Inflammatory Drugs (NSAIDs):** This class, including drugs like ibuprofen and naproxen, is often the first-line pharmacological treatment for LBP. NSAIDs work by inhibiting cyclooxygenase (COX) enzymes, thereby reducing the production of prostaglandins—chemicals that promote inflammation, pain, and fever. They are frequently recommended as a primary medication for LBP [3].

2. **Analgesics:** This category includes medications like acetaminophen, which primarily acts centrally to relieve pain, though its exact mechanism is not fully understood. It is often used for mild to moderate pain when inflammation is not a primary concern.
3. **Opioids:** These potent analgesics (e.g., tramadol, oxycodone, hydrocodone) act on opioid receptors in the central nervous system to block the perception of pain. Due to their significant risks, including sedation, constipation, and a high potential for tolerance, dependence, and addiction, their use is generally reserved for severe, acute pain or in specific chronic cases where benefits are deemed to outweigh the substantial risks [4].
4. **Muscle Relaxants:** These drugs are prescribed to alleviate pain associated with muscle spasms. They act as central nervous system depressants to decrease muscle tone and relieve tension.

The therapeutic philosophy of pain medication is centered on rapid and direct symptom control. It offers a passive form of treatment where the patient's primary role is adherence to a prescribed dosing schedule. While highly effective for acute symptom relief, this approach generally does not address the underlying biomechanical or functional contributors to LBP.

3. Comparative Clinical Effectiveness

The "effectiveness" of a treatment for LBP is a multidimensional concept, encompassing not only the reduction of pain intensity but also improvements in physical function, a decrease in disability, and the ability to return to daily activities. A robust body of research has evaluated both chiropractic care and pain medication, allowing for a detailed comparison.

3.1 Effectiveness of Chiropractic Care

Evidence from numerous clinical trials and systematic reviews supports the use of spinal manipulation for LBP. A 2017 analysis of 15 clinical trials involving over 1,700 patients concluded that spinal manipulation is an effective therapy for low back pain [5]. The effects are often described as modest but clinically meaningful, particularly for acute and subacute LBP.

A significant systematic review and meta-analysis published in 2019 examined SMT for chronic LBP and found that it results in small to moderate, short-term improvements in both pain and function compared to other interventions [6]. While the effect size may be small, it is comparable to other recommended conservative treatments. Furthermore, pragmatic studies, which assess outcomes in real-world clinical settings, suggest that the overall package of chiropractic care (including SMT, exercise, and advice) can be effective [7].

Comparative effectiveness trials have provided further insights. A 2018 clinical trial involving U.S. service members found that adding chiropractic care to usual medical care resulted in significantly better outcomes for pain intensity and disability compared to usual medical care alone [8]. Similarly, a 2013 study demonstrated that the addition of chiropractic manipulative therapy to standard medical care provided a statistically and clinically significant benefit for patients with acute LBP [9]. These studies highlight the value of chiropractic care not just as a standalone treatment but as an integrated component of a comprehensive care plan. The effectiveness can also be dose-dependent, with research suggesting that a course of multiple visits provides more significant benefits for chronic LBP than just a few sessions [10].

3.2 Effectiveness of Pain Medication

The effectiveness of pain medication for LBP varies considerably by drug class and the nature of the pain (acute vs. chronic). NSAIDs are widely recommended and have demonstrated efficacy in reducing acute LBP. A 2023 network meta-analysis confirmed that NSAIDs are effective for short-term pain relief in acute non-specific LBP [11]. However, their superiority over other interventions is not always clear, and their long-term efficacy for chronic LBP is less established [4]. Some evidence even suggests that simple analgesics and NSAIDs have not always been consistently effective on their own for LBP [12].

Opioids, while potent pain relievers, have come under intense scrutiny. Guidelines now strongly advise against them as a first-line therapy for LBP due to their significant risks and limited evidence of long-term benefit. For chronic LBP, research indicates that the benefits of opioids are often outweighed by the harms, and they show little advantage over non-opioid medications in improving pain or function [13]. A 2022 study found that adding opioids to NSAIDs is not superior to using NSAIDs alone for LBP, questioning the utility of this common co-prescription practice [12].

Muscle relaxants can provide short-term relief for acute LBP, particularly when muscle spasm is prominent, but they are associated with significant sedative effects.

3.3 Direct Comparison and Synthesis

When compared directly or indirectly, chiropractic care and pain medication present different profiles of effectiveness. Chiropractic care tends to produce modest but consistent improvements in both pain and, critically, physical function. Its benefits appear to be most pronounced when integrated with usual medical care or as part of a multi-modal approach.

Pain medication, particularly NSAIDs, excels at providing rapid, short-term pain relief for acute episodes. However, its impact on long-term functional improvement is less clear, and the effectiveness of many medications diminishes over time or is limited by adverse effects. For chronic LBP, the evidence for the long-term use of pain medication is weaker, especially for opioids. Chiropractic care, conversely, is often sought by patients with chronic conditions, where its focus on function and self-management may be particularly beneficial [14].

4. Safety and Adverse Events: A Risk-Benefit Analysis

No treatment is without risk, and a critical component of any therapeutic comparison is an evaluation of the safety profiles and potential adverse events associated with each intervention.

4.1 Risks Associated with Chiropractic Care

The risks associated with chiropractic care, specifically spinal manipulation, are generally considered low. The most common adverse events are transient and mild to moderate in nature. These typically include localized soreness, stiffness, or headache following treatment, which usually resolves within 24 to 48 hours.

Serious adverse events are rare. A 2019 systematic review concluded that while minor adverse events are common, serious ones are infrequent [6]. The risk of serious complications such as cauda equina syndrome or vertebral artery dissection is extremely low, particularly when manipulation is applied to the lumbar spine as opposed to the cervical spine. The consensus in the literature is that for LBP, the benefits of spinal manipulation, when performed by a trained and licensed professional, generally outweigh the minimal risks.

4.2 Risks Associated with Pain Medication

The safety profile of pain medication is a significant concern and varies widely between drug classes.

- **NSAIDs:** While available over-the-counter, NSAIDs are not benign. Long-term use or high doses can lead to serious gastrointestinal issues, including ulcers and bleeding. They can also increase the risk of cardiovascular events (heart attack, stroke) and cause renal (kidney) toxicity. Clinical guidelines emphasize using the lowest effective dose for the shortest possible duration to mitigate these risks [3].
- **Opioids:** The risks associated with opioids are substantial and well-documented. Short-term side effects include sedation, dizziness, nausea, and constipation. The more profound risks are tolerance (requiring higher doses for the same effect), physical dependence, and opioid use disorder (addiction). The widespread prescription of opioids for chronic pain has been a major driver of the opioid crisis in many countries.
- **Muscle Relaxants:** The primary risk with muscle relaxants is central nervous system depression, leading to drowsiness and dizziness, which can impair the ability to drive or operate machinery and increase the risk of falls, especially in older adults.

4.3 Comparative Risk Profile

When comparing the two modalities, chiropractic care presents a favorable safety profile for the treatment of LBP. Its associated risks are predominantly minor and self-limiting. In contrast, pain medications, particularly NSAIDs and opioids, carry a risk of systemic and potentially life-threatening adverse events, especially with long-term use.

This risk-benefit calculation is a key factor in recent shifts in clinical guidelines, which increasingly recommend non-pharmacological therapies like spinal manipulation as first-line treatments for LBP, reserving medication for cases where these interventions are insufficient.

5. Long-Term Outcomes and Management of Chronicity

Low back pain is often a recurrent or chronic condition. Therefore, the long-term effectiveness of a treatment—its ability to prevent recurrence, reduce the transition from acute to chronic pain, and minimize reliance on ongoing intervention—is a critical metric of its overall value.

5.1 Long-Term Effects of Chiropractic Care

The philosophy of chiropractic care, with its emphasis on restoring function, patient education, and active self-management, is inherently aligned with promoting long-term spinal health.

By addressing underlying biomechanical issues and empowering patients with exercises and ergonomic knowledge, chiropractic care may help reduce the frequency and severity of future LBP episodes.

A particularly compelling area of research relates to the role of chiropractic care in reducing the need for more invasive or high-risk interventions, such as opioid medication. Recent studies have found a significant association between receiving SMT from a chiropractor and a reduced likelihood of both initiating and long-term use of opioid prescriptions. A 2024 study found that chiropractic SMT was associated with a reduced likelihood of a subsequent tramadol prescription for adults with radicular LBP [15]. An earlier study similarly found that patients who received SMT from a chiropractor were less likely to experience an opioid use disorder [16]. This suggests that chiropractic care may play an important preventative role in the context of the opioid crisis by serving as a viable, effective non-pharmacological alternative for pain management.

5.2 Long-Term Effects of Pain Medication

The long-term management of LBP with medication presents significant challenges. For chronic LBP, continuous reliance on analgesics can lead to a cycle of symptom management without addressing the root causes of the pain. This can result in medication overuse, escalating doses due to tolerance, and an increased risk of adverse events over time.

For NSAIDs, chronic use heightens the risk of gastrointestinal, cardiovascular, and renal complications. For opioids, the development of tolerance and hyperalgesia (a state of increased pain sensitivity) can paradoxically worsen the patient's condition, leading to a state of dependency without meaningful improvement in function or quality of life. The passive nature of taking medication can also foster an external locus of control, where patients feel reliant on a pill rather than on their own ability to manage their condition, potentially hindering long-term functional recovery and self-efficacy.

5.3 Synthesis of Long-Term Outcomes

In the long-term management of LBP, chiropractic care appears to offer distinct advantages. Its focus on improving function and promoting self-management strategies aligns well with the goals of preventing chronicity and recurrence. The emerging evidence that it may reduce reliance on opioid medication is a significant public health benefit. While pain medication is indispensable for managing acute pain flares, its role in long-term, continuous management is limited by a less favorable risk-benefit profile and a lack of focus on functional restoration.

6. Conclusion and Evidence-Based Recommendations

The comparative analysis of chiropractic care and pain medication for the treatment of low back pain reveals two distinct yet potentially complementary therapeutic modalities. The choice between or combination of these treatments should be guided by the nature of the LBP (acute vs. chronic), patient-specific factors, and a comprehensive assessment of the evidence regarding effectiveness, safety, and long-term outcomes.

Pain medication, particularly NSAIDs, serves as a valuable tool for the short-term management of acute LBP, offering rapid and effective pain relief that can facilitate a return to activity. However, its utility is constrained by a significant risk of adverse events with prolonged use and a limited capacity to address underlying functional deficits. Opioids, due to their high-risk profile and lack of evidence for long-term efficacy, should be reserved for carefully selected cases of severe, acute pain and avoided for chronic LBP management.

Chiropractic care, centered on spinal manipulative therapy, presents a compelling option with a favorable safety profile. The evidence supports its effectiveness in providing modest but clinically meaningful improvements in both pain and function for acute, subacute, and chronic LBP. Its key strengths lie in its focus on functional restoration, patient empowerment through education and active care, and its potential role in long-term management. Crucially, emerging research highlights its value as a non-pharmacological alternative that may reduce the need for and risks associated with opioid medication [16] [15].

Based on this evidence-based synthesis, the following recommendations can be made:

1. **Prioritize Non-Pharmacological Care:** In line with modern clinical practice guidelines, non-pharmacological therapies, including chiropractic care and spinal manipulation, should be considered as first-line treatment options for most patients with low back pain.
2. **Judicious Use of Medication:** Pharmacological therapy should be used judiciously. NSAIDs may be appropriate for short-term relief of acute episodes, always using the lowest effective dose for the shortest duration. Opioids should be avoided as a primary or long-term treatment for LBP.
3. **Adopt an Integrated Approach:** The most effective strategy often involves an integrated approach. For instance, chiropractic care can be combined with usual medical care to enhance outcomes [8] [9]. Short-term medication might be used to control severe pain to a level that allows the patient to engage in and benefit from the active components of chiropractic care, such as therapeutic exercise.
4. **Patient-Centered Decision-Making:** The choice of treatment must be a shared decision between the clinician and the patient, considering the patient's preferences, values, comorbidities, and the specific characteristics of their condition.

In conclusion, the debate should not be framed as a simple dichotomy of chiropractic care versus pain medication. Instead, a more nuanced, evidence-based perspective recognizes that each has a distinct role. Chiropractic care offers a safe, effective, and function-oriented approach that is well-suited for both acute and long-term management of LBP, with the added benefit of potentially mitigating opioid use. Pain medication remains a critical tool for acute symptom control but is not a comprehensive long-term solution. The future of effective LBP management lies in the thoughtful integration of these approaches, prioritizing safer, function-focused therapies to improve patient outcomes and reduce the burden of this common condition.

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Author Note
Dr. Robert B. Sheely has practiced chiropractic medicine for over 45 years, specializing in trauma care, biomechanical pathology, and evidence-based documentation for personal injury and rehabilitation. He is a Fellow, Primary Spine Care (candidate). He is also a Fellow of the International College of Chiropractors and the International Academy of Clinical Acupuncture.

Respectfully,

Robert B. Sheely, DC. FICC, FIACA
Director, Middletown Spine and Injury
Fellow, Primary Spine Care (candidate)
Dr Sheely's Current CV: bit.ly/DrSheelyCV