THE IMPACT OF OSTEOPATHIC TREATMENTS ON PATIENTS UNDERGOING REHABILITATION

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Title: The Impact of Osteopathic Treatments on Patients Undergoing Rehabilitation

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Question: Does the addition of osteopathic manual treatments to patients undergoing rehabilitation improve the quality and speed of recovery?

Thesis Statement: The addition of osteopathic manual therapy to a patient's rehabilitation plan will improve the quality and speed of recovery.

Introduction

Physical activity is crucial for healthy living and mobility. Exercise benefits the body only when the body is working at an optimal level. All body parts must also be strong enough to work symmetrically and asymmetrically to properly absorb compressive forces during movement, balance, coordination, and strength development.

In the past few decades, musculoskeletal injuries and surgical needs in dogs have risen significantly. The College of Veterinarians licensed 5,544 veterinarians in 2023—an 11% increase from 2019—and 15 new veterinary surgeons each year over the last 10 years (Bush, 2026). As a result, more people are seeking solutions for their pets' skeletal injuries and mobility problems.

The rise of competitive canine sporting events, involving high speeds, multiple directional changes, and navigation of heights, has also contributed to increased musculoskeletal injuries. In an internet-based survey conducted by AVMA Journals, 1,958 dogs were included: 41.7% experienced injury, 30.1% in the shoulder, and 19.4% in the iliopsoas, with the border collie among the most affected breeds (Pechette Markley et al., 2021).

With the rise of the doggy daycare industry, we are also seeing young, skeletally immature dogs being subjected to excessive running and prolonged compressive forces on growing bones, possibly contributing to the increase in stifle disease, cranial cruciate injuries in young dogs, and early-onset osteoarthritis. In a recent paper, early-life exercise levels were included as a possible contributor to early-onset joint disease (MacMillan, 2023). With an estimated 9 million pet dogs in the UK and 63.4 million dog households in the US, the prevalence of OA is suspected to affect 20% of dogs over 1 year old, with 1.32 billion being spent on cruciate ligament injuries alone in

the US in 2003 (Anderson et al., 2021). The number of pet dogs also continues to grow, with recent statistics indicating further increases in ownership worldwide (Martyn, 2025).

The large number of pet dogs in recent years means we can expect more musculoskeletal injuries related to their normal activities. These injuries are driven by genetics, conformation, age, body condition, and irregular or undisciplined exercise (Anderson et al., 2021).

As the number of veterinarians rises, more seek to specialize in canine physical rehabilitation. This approach to healing is now available at most veterinary facilities and at specialized centers focused on canine recovery and mobility.

Canine rehabilitation is an important addition to primary care, particularly for injuries requiring treatment beyond pharmaceuticals. Physical rehabilitation uses modalities applied to tissues — bone, joints, connective tissue, and muscles — to improve extensibility, flexibility, and mobility. These modalities use energy to stimulate tissues and their chemical constituents, increasing metabolic rate and improving healing. Specific modalities, such as photobiomodulation and therapeutic ultrasound, use infrared and acoustic sound waves to produce and remodel scar tissue and promote healthy collagen formation (Hesbach, 2014).

Both modalities can reduce pain. During photobiomodulation, infrared energy absorbed by tissue cells increases ATP (adenosine triphosphate) production and stimulates the release of NO (nitrous oxide) (Smith, 2025).

When cells undergo stress, such as injury, nitric oxide production increases, reducing the space for oxygen to bind to the cells and decreasing ATP production. The release of NO from cells

allows mitochondria to take in more oxygen, thereby increasing circulation and lymphatic drainage (Smith, How Laser Therapy Works, 2025).

Therapeutic ultrasound produces focused acoustic output that can be applied in both thermal and non-thermal ways. Thermal effects improve tissue extensibility deep within the tissue, while non-thermal effects promote collagen alignment, improve muscle flexibility, strengthen healing tendons, and can assist in medication delivery (Best et al., 2016). Extracorporeal shockwave therapy uses high-energy sound waves to produce effects similar — and in some cases greater — than those seen with therapeutic ultrasound. Both modalities are useful in chronic injuries due to their proinflammatory nature; shockwave therapy additionally promotes angiogenesis and the release of anti-inflammatory proteins (Hundal, n.d.).

In addition to electrotherapeutic modalities (such as electrical stimulation), rehabilitation also includes other therapies to improve joint and muscle movements, low-dynamic strengthening exercises, and exercises to retrain and reeducate the patient's walking and trotting to ensure they move symmetrically and efficiently.

Hydrotherapy and therapeutic exercises are often used in rehabilitation. These are added when patients are more comfortable, and pain levels have decreased. We then incorporate other modalities to begin strengthening the body. Although these modalities often strengthen tissue, they can also be therapeutic.

Physical rehabilitation for the patient often focuses on the injured area. Osteopathy focuses on the entire body and its symmetry of movement. When somatic dysfunction occurs, we see altered function in the musculoskeletal, nervous, and lymphatic systems. Like physical rehabilitation, osteopathy and osteopathic manipulative treatment aim to remove the "blockage" or "barrier" causing dysfunction. However, osteopathy also addresses the connections between the central

nervous and lymphatic systems, providing a more symmetrical approach and restoring mobility beyond the barrier.

The basis of osteopathic medicine has four general principles.

1. The body is a unit composed of body, mind, and spirit.
2. The body can regulate, heal, and maintain health.
3. Structure and function are interrelated.
4. Rational treatment is based on the understanding of the above three principles.

Osteopathy focuses on dysfunction in the structures and tissues (such as bones, muscles, and connective tissue) that provide the body with stability and strength. This is referred to as somatic dysfunction (an impaired or altered function of these body components).

This concept dates back to the discipline's founder, Andrew Taylor Still. According to him, “when the ability of the body is hampered by moment restrictions or imbalances in tissues, it can lead to physiological dysfunctions and symptoms of disease” (Korr, 1988).

Many factors contribute to somatic dysfunction. These include muscular trauma, decreased postural strength, and even changes in emotional state. This altered state in the body and mind affects blood circulation, impairs lymphatic drainage, and disrupts the nervous system. As a result, widespread health problems can occur.

Using specialized techniques, divided into direct and indirect forms of treatment, the practitioner can choose the most appropriate technique for the situation and the patient (Voronov, 2023). With specialized palpatory skills, the practitioner can identify the area of discomfort and restriction

and work to alleviate, reduce, or remove the bind in attempts to restore movement through the restriction. When working with canine patients, indirect techniques are often the best choice due to their gentle nature. The goal is to relax the patient and induce natural, body-induced healing. The functional technique is generally very well received by canine patients (Bowles, 1961).

The technique of osteopathic balancing, developed by Stuart McGregor, DO, helps restore balance to an affected limb or the entire body. It does this by regulating and restoring nerve supply, blood circulation, and lymphatic drainage, thereby restoring joint movement and its supportive connective tissue (McGregor, n.d.). Combined with the functional technique, which focuses on osteopathic manipulative therapy principles, this approach provides a solid foundation for correcting somatic dysfunction.

This thesis aims to draw a parallel between the addition of osteopathy to a patient's rehabilitation program and the time to complete recovery. To discuss healing times, we must have a general understanding of the healing process as it pertains to the body's connective tissue. Each type of tissue has an expected rate of healing, but it is also influenced by factors such as injury severity and the patient's age, which can affect the rate of healing and recovery.

Tissue healing of any kind follows a well-defined biological process that progresses through three phases (Häggström, n.d.; Kirkby-Shaw et al., 2019).

1. Inflammatory phase – 0- 7 days
2. Proliferative phase – 3 days to 6 weeks
3. Remodeling phase – 6 weeks to 2+ years

The ideal time to begin rehabilitation is during the proliferative and remodeling phases of healing.

Understanding that connective tissue, such as muscle, ligament, and tendon, heals by forming a scar, while bone heals by forming new bone to surround the fracture, creating a callus. Where bone healing is considered 100% healed (in most instances), soft tissues such as muscle, ligament, and tendon rely on the strength and mobility of the scar (Birkett, 1999; Kirkby-Shaw et al., 2019).

The expected time frames for each type of connective tissue to heal have been outlined in evidence-based literature (Häggström, n.d.).

Tissue Type	Healing Time	Healing Comments
Muscle	1 – 6 months	Severity dependent
Tendon	3 months (functional movement	1 year from complete remodeling
Ligament (extracapsular)	3 weeks – 6 months	Strain severity dependent
Ligament (intracapsular)		Unlikely to heal
Bone	1 – 3 months	
Cartilage	2 months – 2 years	Limited regeneration capacity
Nerve	3 weeks – 1 year	Research shows 1-2 mm/day regeneration rate

Note: Adapted from "Tissue Healing Times and Healing Phases," by M. Häggström, via Physical Therapy Web (physicaltherapyweb.com). Public domain.

Healing an injury is the first part of the recovery process, and it is important to implement rehabilitative measures accordingly based on the known phases of healing. This will support the remodeling of the scar as it forms, ensuring its strength and extensibility once healing is complete.

Of course, with any hands-on palpatory therapy, subjective and objective evaluation must always guide the choice of treatment. This evaluation, consisting of palpation and observation of movement, can help the practitioner work within the “individual” rate of healing while understanding the known biological process of healing.

Physical Therapy and Rehabilitation in Canine Patients

In a study published in the Indian Journal of Veterinary Science and Biotechnology, 9 dogs were followed for 3 years. These dogs all had chronic locomotor difficulties and struggled to respond to medical treatment. This study examined their response to physiotherapy and rehabilitation, including manual therapy techniques (passive range of motion, massage, and stretching) and thermal therapies (laser therapy, therapeutic ultrasound, electrical stimulation, and therapeutic exercises). The dogs were evaluated throughout the study, with assessments of pain grade, muscle strength, weight-bearing, coordination, and return to normal activities. They concluded that the dogs that were managed with physiotherapy and rehabilitation had optimal healing,

allowing an early return to normal activity. The study also highlighted the importance of physiotherapy and rehabilitation during healing and its role in restoring and maintaining optimal joint range of motion. There are commendable options in rehabilitation modalities to provide and support pain relief, which is what ultimately resulted in improved quality of life. The elimination or reduction of pain makes way for the next phase: healing, which aims to improve muscle engagement and range of motion. The addition of therapeutic exercises will help the patient improve mobility and endurance, starting with initial weight-bearing and low-level gait training exercises. (Ratnav & Parikh, 2022).

This study concluded that the addition of rehabilitation measures was effective in achieving optimal recovery and a more complete recovery. The addition of osteopathic balancing and functional techniques would ensure the entire body receives a reset in movement, fluidity, and symmetry, as osteopathy offers a whole-body approach to healing.

A review by Kirkby-Shaw et al. (2019) primarily examined CCL injury in the canine stifle and the various stages of healing it presents. When considering the surgical approach to stabilization, the practitioner must account for all stages of tissue healing, from the skin to bone healing at the osteotomy site. With surgical repair, we can expect, in the best-case scenario, the bone to heal in 12 weeks. This is the ultimate healing goal with a repair such as a Tibial Plateau Levelling Osteotomy. Still, we also know that muscle loss is significant in the early stages of injury and during postoperative healing. This study highlighted the complexity of healing after cranial cruciate ligament surgical repair. Understanding this complexity, we can still engage one tissue to heal another. Considering Wolff's Law, the bone can become stronger and denser when exposed to simple loading. We can also consider how simple weight-bearing can improve the rate and quality of bone healing, as well as request simple muscle engagement and contraction, keeping

the muscles viable for building when they reach the stage of therapeutic exercises. Other principles were also explored, such as passive range of motions and their importance in restoring and maintaining normal joint range of motion and normalizing gait patterns. Although this study did not provide detailed recovery timelines, it does outline expected timelines for common orthopedic conditions.

In a study examining tendon disorders in the canine shoulder, dogs were treated for shoulder muscle-tendon injuries over 21 days and at least 6 sessions. The treatment consisted of laser therapy and therapeutic ultrasound, with the first 6 sessions aimed at controlling pain and an additional set of sessions working with therapeutic exercises to rebuild strength. In the first 60 days, 80% of patients achieved clinical recovery—no lameness or palpable pain —and after 120 days, 92% were clinically healed. It was important to note that ultrasound healing times were longer than the time to clinical sign disappearance (Arena et al., 2025).

This study had a mean age of 8 ± 4 years, and OA was present in 2 patients, making it difficult to generalize about the healing rate. A takeaway from this research article is that it concluded in favour of a faster and more complete recovery from the primary injury with the addition of physiotherapy and rehabilitation modalities.

In all of these studies, the reviews and evaluations are specific to a joint and a limb; they do not account for dysfunction in the additional joints, the back, and the contralateral limb as they adapt to the primary injury. Osteopathic balancing and functional techniques would address this gap — improving circulation and nervous input to the affected limb while also managing compensatory injuries. The addition of osteopathy to the treatment plan would therefore improve the quality, completeness, and duration of recovery.

Strain of the iliopsoas muscle is and should be considered important as an injury in itself, and one that is often related to underlying pathologies such as cranial cruciate ligament rupture (CCLr) and canine hip dysplasia (CHD). In a study examining 10 dogs with iliopsoas muscle injury followed through a physiotherapy-based healing approach, the authors examined how treating the injury with a multimodal physiotherapy approach would improve muscle healing and reverse clinical signs (Spinella et al., 2021). This study aimed to identify recovery times in days and the rate of full return to sport using popular physiotherapy modalities, including therapeutic ultrasound, manual therapy, and the underwater treadmill. They concluded that over 3 weeks comprising 6 sessions, lameness decreased in mild and moderate cases of iliopsoas strain. Additional therapy was suggested to ensure a full return to sport. The addition of osteopathic articulating balancing and the functional technique would be the most important addition to the treatment plan, giving it the best opportunity for a more complete recovery. Injury to the iliopsoas muscle can significantly affect the lumbar spine and the movement of the pelvis during locomotion. Balancing of the lumbar spine and the movement of the paraspinal muscles, as well as restoring movement to the pelvic and sacroiliac joints, would also be necessary for a complete recovery and improved mobility. Only with the addition of osteopathic therapy could a complete recovery be considered in these dogs.

Osteopathy in Human Patients

In an experimental study, the researchers looked at the failure of connective tissue to withstand mechanical loading, as well as repeated structural and functional disorders of the musculoskeletal system, leading to degenerative dystrophic disease and chronic pain syndrome (Sankova et al., 2024). Because musculoskeletal injuries remain the most common sport-related injuries, options other than pharmacological therapy must be explored and considered.

In the study, 117 participants involved in popular sports received osteopathic treatment. The complaints consisted of chronic pain, spinal discomfort, muscle tightness and stiffness, sleep disturbance, and emotional imbalance. As a result of osteopathic treatment, positive trends were observed. The use of specialized techniques to restore movement in the kinetic chain was followed by increased mobility, physical activity, and willingness to participate in social life. Correcting muscle tonic imbalance improved pain, improved strength, and well-being. They found that after a course of osteopathic treatment, patients showed not only improvement in sleep, mood, and general well-being, but also a significantly shortened recovery period. They recommended a complementary relationship between osteopathy and other traditional rehabilitation and concluded that osteopathy significantly increased the efficacy of the rehabilitative treatment.

A published systematic review evaluating the effectiveness of osteopathic treatment in adults with short hamstring syndrome aimed to demonstrate the efficacy of osteopathic techniques in treating shortened hamstrings (Berea-Orgando et al., 2024). The muscle energy technique and vertebral mobilization focused on the lower back were implemented, resulting in significant improvements for the patients. The study examined various osteopathic techniques and concluded that some offered better recovery than others, once again underscoring the need to properly identify the bind and adopt the most effective, pain-reducing approach to recovery.

Although this study did not discuss healing times, it did discuss improvement with the addition of osteopathic treatments. One can extrapolate from this study that if there is improvement in the muscle movement, there will be improvement in the pain syndrome. Once you achieve better muscle mobility and reduced pain, other rehabilitative measures to build strength can be implemented. If the treatments are carried out consistently, the rate of recovery would likely improve.

In a final study, the most common injuries among sports enthusiasts were examined, focusing on those affecting muscles, ligaments, and tendons, but excluding joint capsules, articular cartilage, and intervertebral discs (Biyikli, 2025). Due to the broad range of tissue types, the differential diagnosis was difficult and not limited to a single body part. The main objective was to reduce inflammatory response, repair tissue, and have a full return to athletic ability. By initiating osteopathic manipulation in an attempt to relieve immediate symptoms and going beyond this to compel the body to use natural protective homeostatic mechanisms, they believed that the healing time would be significantly reduced, as well as reducing the damage to the affected area and reducing or eliminating compensatory injury that would only lengthen recovery time.

Conclusion

This was a difficult topic to research; there were few studies on canine physiotherapy and rehabilitation, and almost none on canine osteopathy. That, coupled with the lack of good, sourceable research on injury-healing times and recovery when complementary therapies such as physiotherapy, rehabilitation, and osteopathic treatments were implemented. Of the articles and research I found, they focused almost exclusively on one particular part of the body and the injury directly affecting that connective tissue. No further work was done to evaluate how the patient would recover if the limb were addressed as a whole, considering the other joints in the limb and the muscles, ligaments, and tendons associated with their movement. It stands to reason that if one area of the limb or body is suffering from dysfunction, the guarding of this area alone would predispose the rest of the limb to compensatory strain and tightness. In addition, depending on how long the patient had the injury before seeking treatment, there may be additional compensatory injuries in the contralateral and ipsilateral limbs and across the back. These are not the primary injury, but they will affect overall healing and return to normal activity, thereby decreasing overall healing time and the completeness of recovery of the body as a functioning unit.

Despite these limitations, the evidence from both canine and human studies consistently supports the thesis that adding osteopathic manual therapy to a rehabilitation plan improves both the quality and the speed of recovery. Studies by Ratnv and Parikh (2022), KirkbyShaw et al. (2019), and Arena et al. (2025) all demonstrated that multimodal approaches to canine rehabilitation resulted in faster return to function and more complete recovery outcomes. In human patients, Sankova et al. (2024) and Biyikli (2025) further demonstrated that osteopathic treatment not only shortened recovery periods but also addressed compensatory dysfunction and reduced the

likelihood of reinjury. Taken together, these findings provide compelling support for integrating osteopathic manual therapy into standard canine rehabilitation protocols.

All disciplines seek dysfunction, but they use different techniques to restore homeostasis. Physiotherapy and rehabilitation use energy modalities to affect cells within tissues, reducing inflammation, triggering chemical changes that allow the release of nitric oxide from ischemic areas, facilitating the uptake of oxygen and vital nutrients into cells, and altering cell metabolism. Thermal and non-thermal therapeutic ultrasound helps strengthen and align collagen, helping achieve a strong, flexible scar once the area is healed. When osteopathic treatments, such as the functional technique and osteopathic articulating balancing, are used in addition to and combined with physiotherapy and rehabilitation, we would see better blood flow, better lymphatic drainage, and the muscles would be allowed to relax from the origin to the insertion to allow the nerves to gain control of nociception and reduce pain. This collaboration combines the focused healing generated by physiotherapy and rehabilitation modalities with the whole-body balancing achieved through osteopathic manual therapy, creating an optimal approach to healing that enables a faster, more complete recovery.

The four principles of osteopathy — that the body is a unit, that it can self-regulate and heal, that structure and function are interrelated, and that rational treatment is based on these principles — align naturally with the goals of canine rehabilitation. It is this alignment that makes osteopathic manual therapy not merely a complementary addition, but a logical and necessary component of a complete rehabilitation plan. With a more complete recovery, the connective tissue will be healthier, stronger, and more extensible, reducing the likelihood of future injury and shortening recovery periods after injury. The thesis question posed at the outset — whether the addition of

osteopathic manual treatments improves the quality and speed of recovery in the rehabilitation patient — can be answered affirmatively based on the available evidence. Further research, particularly studies focused on canine patients receiving combined osteopathic and rehabilitation treatment, is strongly recommended to build a more robust evidence base for this integrative approach.

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