London College of Animal Osteopathy

International Diploma in Equine Osteopathy

Compensation Patterns Associated with Chronic Sacroiliac Dysfunction in Performance Horses and Their Influence on Osteopathic Assessment and Management

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Introduction

Balanced movement in horses relies on the hindquarters' capacity to generate power and transmit it efficiently through the pelvis, spine, and the remainder of the body. The sacroiliac (SI) region is integral to this process, functioning as the primary connection between the hind limbs and the axial skeleton. Due to its critical role in stability, propulsion, and the transmission of power from the hindquarters, dysfunction within the SI region can affect movement patterns throughout the body. A significant challenge in managing chronic SI dysfunction is that clinical signs are often subtle and develop gradually. Many performance horses continue working despite underlying dysfunction, making early recognition difficult.

The SI region plays a central role in athletic performance, and dysfunction within this area has been associated with reduced impulsion, altered gait patterns, poor performance, and behavioral signs of discomfort (Goff et al., 2008). Despite its clinical importance, SI dysfunction remains challenging to diagnose due to the joint's depth, the complexity of surrounding structures, and the subtle and variable nature of its presentation. Clinical signs frequently overlap with other musculoskeletal disorders, making accurate diagnosis difficult (Walter et al., 2024). This challenge becomes even greater when compensatory patterns have persisted for an extended period.

In performance horses, chronic SI dysfunction is commonly associated with repetitive loading rather than a single traumatic event (Bazay, 2026). Disciplines such as dressage, jumping, eventing, and racing place substantial demands on the hindquarters through repeated engagement, collection, propulsion, and lumbosacral stabilization (Goff et al., 2008). Over time, these demands may contribute to altered biomechanics, muscular imbalance, and functional

impairment within the SI region (Bazay, 2026). Additional factors, such as poor hoof balance, distal limb lameness, inadequate conditioning, and conformational predispositions, may further increase stress on the SI region and contribute to the development of dysfunction (Marcella, 2025). In many horses, multiple contributing factors are likely involved rather than a single identifiable cause.

From an osteopathic perspective, dysfunction within the SI region must be evaluated in the context of the horse's overall movement and biomechanical function. Current evidence indicates that the axial and appendicular skeletons operate in close coordination, with dysfunction in one region frequently influencing movement and loading patterns elsewhere in the body (Ramon et al., 2025). SI region dysfunction may result in compensatory adaptations beyond the pelvis. Understanding these interrelationships is important when assessing horses with chronic SI dysfunction, especially when signs are subtle or when multiple anatomical regions are involved.

Although veterinary interventions such as SI injections provide valuable diagnostic information and help manage pain and inflammation, they are generally directed toward the affected region itself. However, chronic SI dysfunction often involves broader biomechanical adaptations that may also warrant consideration during assessment and management (Walter et al., 2024). Osteopathic manual therapy (OMT) offers a complementary perspective by evaluating how SI dysfunction influences overall movement and addressing compensatory changes that may contribute to ongoing dysfunction and lowered performance (Musso & Andrews, 2025). As a result, assessment is directed not only to the site of dysfunction but also to the changes that may have developed throughout the body.

This paper examines the factors contributing to chronic SI dysfunction in performance horses, explores the associated compensatory biomechanical patterns, and discusses the role of osteopathic manual therapy in assessment and management.

Anatomy and Biomechanics of the Sacroiliac Region

The sacroiliac region functions as a crucial connection between the hind limbs and the axial skeleton. Unlike highly mobile synovial joints, the SI offers very little movement. While the SI joint is classified as a synovial joint, it is unique in that the sacral articular surface is covered with hyaline cartilage, whereas the iliac surface is covered with fibrocartilage (Goff et al., 2008). It is a large, weight-bearing joint, with flattened, closely fitting surfaces that limit mobility (Bazay, 2026). The primary function of the SI joint is to provide stability while assisting efficient transmission of power generated by the hind limbs during propulsion (Goff et al., 2008). This energy transfer is essential for impulsion, collection, jumping, turning, and overall athletic performance. Because of this role, dysfunction affecting the SI region may have widespread biomechanical consequences.

The SI region consists of the articulation between the sacrum and ilium and is supported by an extensive network of ligaments, fascia, and surrounding musculature. Stability depends heavily on the dorsal and ventral sacroiliac ligaments as well as the coordinated function of the surrounding soft tissues (Goff et al., 2008). Walter et al. (2024) suggest that clinical SI dysfunction may involve combinations of dysfunction affecting the joint, ligaments, fascia, muscles, and neural structures, rather than the joint alone. This reinforces the concept that SI dysfunction is often more complex than a localized joint disorder.

Performance horses place substantial biomechanical demands on the SI region. Repeated collection, engagement, jumping, acceleration, and changes in direction generate substantial mechanical demands that must be absorbed through the pelvis and transferred into the trunk (Kruger, 2022). Repetitive loading associated with these activities may contribute to cumulative stress within the SI region and surrounding soft tissues over time (Bazay, 2026). As a result, dysfunction may develop gradually through repetitive strain, altered movement patterns, and muscular imbalance rather than a single identifiable injury.

From an osteopathic perspective, the SI region functions as part of a larger system rather than an isolated structure. Interactions between the axial and appendicular skeleton influence movement patterns, muscle activity, and load distribution throughout the body (Ramon et al., 2025). Fascial tissue may play a role in these relationships by creating mechanical links between anatomical regions (Ridgway, 2018). These relationships may help explain the widespread compensatory patterns often observed in horses with chronic SI dysfunction.

Compensatory Biomechanical Patterns Associated with Sacroiliac Dysfunction

One reason chronic sacroiliac (SI) dysfunction can be difficult to recognize is that horses often compensate remarkably well. In performance horses, dysfunction frequently develops gradually, allowing the body time to adapt rather than producing obvious clinical signs immediately. As a result, horses may continue training and competing while subtle changes in posture, movement, and performance become increasingly established. By the time a decline in performance is recognized, compensation patterns may already involve multiple regions of the body.

To visualize how this works, think of the horse's muscular system like a network of interconnected pulleys. When one pulley gets tight or stops moving properly, the rest of the system has to work harder to pick up the slack. At first, these changes might be too subtle to notice under saddle. But over time, that constant extra strain leads to chronic muscle tightness, restricted joint mobility, and secondary issues in areas that are trying to help the horse compensate.

Clinical signs associated with SI dysfunction commonly include poor performance, reduced impulsion, back and hindquarter stiffness, and rider-perceived discomfort (Ramon et al., 2025). Horses may also demonstrate reluctance to maintain canter, difficulty picking up or holding the correct lead, deterioration in canter quality, and challenges with movements requiring engagement of the hindquarters (Ramon et al., 2025). These signs commonly reflect the horse's attempt to perform despite underlying dysfunction within the SI region.

Interpretation of these outcomes can be challenging because similar movement adaptations may result from dysfunction elsewhere in the musculoskeletal system. Keegan (2005) demonstrated that both forelimb and hindlimb lameness can alter pelvic movement patterns, highlighting that pelvic asymmetry alone does not necessarily indicate primary SI dysfunction. The pelvis may instead be responding to altered loading originating elsewhere in the body. This finding highlights the importance of evaluating the horse as a functional whole rather than focusing only on the apparent site of dysfunction.

Current evidence increasingly supports interactions between the axial and appendicular skeleton in the development of compensatory movement patterns. Ramon et al. (2025) suggests

that pain and dysfunction affecting one region may alter loading patterns, muscular activity, and overall function elsewhere in the body. As altered movement patterns persist, compensatory changes may develop throughout the thoracolumbar, cervical, and limb regions as the horse attempts to retain stability and performance.

Osteopathic observations also support the development of widespread compensatory patterns in horses with chronic SI dysfunction. In an evaluation of 374 horses examined osteopathically, Thoresen (2009) reported that sacroiliac dysfunction was frequently associated with restrictions involving the hips, thoracolumbar region, shoulders, and cervical spine. Thoresen observed that chronic cases often accumulated additional restrictions throughout the body, suggesting that dysfunction rarely occurs in isolation. As compensation becomes more established, secondary restrictions may develop in areas that appear unrelated to the original problem, strengthening the importance of evaluating the horse beyond the primary site of dysfunction (Thoresen, 2009). This may be especially important in performance horses, where subtle compensatory adaptations can become deeply established before a decline in performance is recognized.

Understanding compensatory relationships is useful, as the region exhibiting the most restriction or discomfort may not be the primary lesion. Horses frequently continue to work while compensatory patterns become more established, resulting in secondary regions appearing more symptomatic than the original dysfunction. Effective management of chronic SI dysfunction includes evaluation of both the primary lesion and the compensatory adaptations that have developed throughout the body (Goff et al., 2008).

Primary Versus Secondary Dysfunction

One of the greatest challenges in horses presenting with suspected sacroiliac dysfunction is determining whether the SI region represents the primary source of dysfunction or whether it has become involved as part of a larger compensatory pattern. While clinical signs may suggest involvement of the SI region, they do not necessarily indicate that the pelvis is the main source of the problem. Distinguishing between primary and secondary dysfunction is therefore an important component of assessment and management.

In some horses, dysfunction may originate within the SI region itself. Chronic repetitive loading associated with athletic performance may contribute to gradual development of dysfunction within the joint and surrounding soft tissues. As previously mentioned, disciplines such as dressage, jumping, eventing, and racing place substantial demands on the hindquarters (Bazay, 2026). Over time, these forces may contribute to inflammation, pain, restriction, or reduced function within the SI region. In these cases, the pelvis may represent the primary lesion driving the compensation pattern.

In other horses, dysfunction within the SI region may develop secondary to a problem elsewhere in the body. Chronic hindlimb lameness, hock pathology, hoof imbalance, or other sources of musculoskeletal dysfunction may alter loading patterns and increase mechanical stress on the pelvis over time (Ramon et al., 2025). As the horse adapts to discomfort or restrictions, compensatory movement patterns may develop, eventually leading to secondary dysfunction in the SI region. The SI region may therefore become clinically significant even if it is not the true source of dysfunction.

The importance of this distinction is reflected in both research and clinical practice. Horses presenting with SI or back pain may actually be protecting another region of the body,

particularly the hocks or distal hind limbs (Kentucky Equine Research Staff, 2018). Likewise, Keegan (2005) demonstrated that both forelimb and hindlimb lameness can alter pelvic movement patterns. These findings point out that pelvic asymmetry alone should not be interpreted as evidence of primary SI dysfunction and highlight the importance of a thorough evaluation.

From an osteopathic perspective, identifying the primary lesion requires consideration of the relationships between posture, quality of movement, tissue texture, and compensation patterns. Rather than concentrating solely on where discomfort is observed, the practitioner seeks to understand why dysfunction developed and how the horse has adapted over time (Nevin et al., 2020). This approach recognizes that the most symptomatic region may not always reflect the problem's origin.

The importance of identifying the primary driver of dysfunction is also reflected in equine rehabilitation literature. Clayton (2016) emphasizes that successful rehabilitation depends not only on recognizing where pain or restriction is present, but also on understanding the causes that contributed to its development. Failure to address the underlying cause may allow compensatory patterns to persist, even as short-term improvements are observed.

Understanding whether SI dysfunction is primary or secondary has important effects on management. Successful outcomes depend not only on identifying where dysfunction is present, but also on identifying the factors that caused its development. By distinguishing primary dysfunction from secondary compensation, management strategies can be directed toward the underlying cause instead of only addressing the resulting symptoms.

Osteopathic Assessment of Horses with Suspected Sacroiliac Dysfunction

Because chronic SI dysfunction may contribute to compensatory changes throughout the body, assessment of the SI region should go beyond identifying local pain or restriction. While veterinary diagnostics play an essential role in identifying injury and ruling out other conditions, Nevin et al. (2020) emphasize the importance of considering how dysfunction in one region may influence movement and compensation in other regions. From an osteopathic perspective, this broader assessment may help identify variables contributing to ongoing dysfunction within the SI region.

Osteopathic philosophy is founded on the principle that structure and function are interdependent and that the body functions as an integrated unit (Musso & Andrews, 2025). Rather than evaluating the SI region in isolation, the osteopathic practitioner considers relationships between posture, movement quality, tissue texture, and biomechanical function (American Osteopathic Association, 2025). This perspective is particularly relevant in performance horses with chronic SI dysfunction, where long-standing compensation patterns may obscure the primary source of restriction or discomfort.

Assessment commonly begins with observation of the standing horse. Postural asymmetries, weight-bearing preferences, muscle development, pelvic position, and overall balance may provide insight into how the horse has adapted over time (Nevin et al., 2020). While these conclusions are not diagnostic in themselves, they may help identify compensatory patterns and guide further evaluation.

Movement assessment is another important component of the osteopathic examination. Evaluation of the horse at the walk and trot may reveal asymmetries in stride length, pelvic motion, spinal mobility, engagement of the hindquarters, or overall athletic performance.

Haussler (2003) notes that many horses with SI dysfunction present subtle gait abnormalities that may be difficult to identify during a routine examination, particularly in chronic cases where compensation has become well established. Dynamic assessment therefore gives valuable information regarding how movement is distributed throughout the body and how the horse adapts to dysfunction during movement.

Palpation and motion testing are used to evaluate tissue texture, muscular tension, fascial restrictions, and mobility between anatomical regions (Nevin et al., 2020). Rather than focusing exclusively on the SI region, the osteopathic practitioner considers how findings within the pelvis relate to the thoracolumbar spine, cervical region, limbs, and surrounding soft tissues. Particular attention is given to areas that may be causing, or adapting to, altered movement patterns associated with chronic SI dysfunction.

In addition to identifying restrictions, osteopathic assessment works to understand how those restrictions influence posture and movement. Findings observed during the static evaluation may not always correspond to those observed during movement, illustrating the importance of both components of the assessment. Comparing postural adaptations with movement patterns may provide additional insight into how the horse has compensated over time and help identify areas that justify further investigation.

Ultimately, the goal of osteopathic assessment is not simply to determine where restriction is present, but to understand how that restriction developed and how it influences overall function. By evaluating the horse as a whole, the practitioner may be better equipped to distinguish primary dysfunction from secondary compensation and to develop a management approach that addresses the causes of ongoing dysfunction.

Osteopathic Management of Sacroiliac Dysfunction

Successful management of SI dysfunction requires review of both the affected region along with the broader biomechanical changes that may develop over time. This approach is consistent with osteopathic principles, which emphasize restoration of function and support of the body's ability to move efficiently (Nevin et al., 2020). Osteopathic manual therapy (OMT) is based on the principle that optimal movement depends upon normal mobility, balanced tissue tension, and efficient transmission of power throughout the body (Musso & Andrews, 2025). When dysfunction develops within the SI region, its effects may spread beyond the pelvis, influencing surrounding soft tissues, neural structures, and other regions involved in maintaining movement and stability.

Management is guided by findings obtained during the osteopathic assessment. Osteopathic Articular Balancing (OAB) techniques may be directed towards regions demonstrating reduced mobility, with the goal of restoring more balanced biomechanical function (Thoresen, 2009). By gently taking these restricted joints through their available range of motion, OAB helps quiet chronic muscle guarding. This encourages the nervous system to let the deep stabilizing muscles release, breaking the cycle of tightness that keeps the SI joint locked up.

Myofascial release techniques may also play an important role in horses with chronic SI dysfunction. Compensation patterns that develop over time often contribute to increased tension within surrounding musculature and fascial tissues (Scheibenpflug & Haussler, 2026). Nevin et al. (2020) describe myofascial kinetic lines as continuous anatomical pathways capable of transmitting tension throughout the body, while Ridgway (2018) suggests that restrictions

affecting one portion of the fascial system may influence distant structures through mechanical continuity. Addressing fascial restrictions may therefore help reduce abnormal tension patterns and improve overall movement quality. In many cases, soft tissue and myofascial techniques are used alongside OAB techniques to address both articular restrictions and the muscular and fascial changes that have developed over time (Thoresen, 2009).

Emerging research provides preliminary support for the osteopathic management of SI dysfunction. In a randomized controlled clinical trial involving 29 sport horses with SI dysfunction, Ramon et al. (2025) reported that a single osteopathic manipulation of a dysfunctional SI joint resulted in reduced epaxial muscle tone, decreased back and sacroiliac pain, improved osteopathic functional assessment scores, and small but statistically significant changes in selected canter gait parameters. These outcomes suggest that improving mobility within the SI region may positively influence comfort and movement, although additional research is needed to better understand the long-term effects of osteopathic manual therapy. Interpretation of these outcomes should be made with caution, however, as the study involved a relatively small sample size and evaluated only the short-term effects of a single intervention. Additional research is needed to determine whether these improvements are maintained over time and across a larger number of horses.

Clinical observations reported by Thoresen (2009) further support the potential value of osteopathic intervention. In horses presenting with sacroiliac dysfunction, restrictions were frequently accompanied by dysfunction involving the hips, thoracolumbar region, shoulders, and cervical spine. Positive outcomes were reported in the majority of treated horses, supporting the concept that dysfunction often goes beyond a single anatomical region (Thoresen, 2009). These

outcomes were based on clinical case reports rather than controlled experimental research and should therefore be interpreted as observational evidence rather than definitive proof of effectiveness. However, the results support the osteopathic principle that successful management often requires addressing compensatory restrictions throughout the body rather than concentrating solely on the SI region.

Osteopathic management should not be viewed as a replacement for veterinary diagnosis or veterinary care. Haussler (2003) emphasizes that SI dysfunction can be difficult to diagnose and may occur alongside other musculoskeletal conditions. Horses with significant pain, inflammation, ligament injury, or concurrent lesions will benefit from veterinary interventions including rehabilitation programs, medication, or SI injections when appropriate. Because chronic SI dysfunction often involves multiple contributing factors, management may benefit from a collaborative approach that considers both local pathology and its broader effects on movement and function.

This distinction may be particularly important in performance horses. A horse may experience improved comfort following local management of the SI region while continuing to demonstrate movement asymmetries, postural adaptations, or restrictions elsewhere in the body. In these situations, OMT may serve as a complementary approach by addressing factors that continue influencing movement despite successful management of the primary dysfunction. Rehabilitation remains an important component of long-term management. Successful rehabilitation programs should address the underlying biomechanical aspects contributing to dysfunction while promoting strength, coordination, and efficient movement patterns (Clayton, 2016). Programs designed to strengthen the musculature of the pelvic region and spinal column

commonly incorporate progressive walking exercise, circles, serpentines, and controlled transitions to improve stability and function of the SI region (Ricard, 2026). These exercises aim to gradually restore strength, coordination, and mobility while supporting more balanced movement patterns throughout the body (Goff, 2022).

Osteopathic manual therapy is a valuable modality for its ability to evaluate and address the horse as a functional whole. When integrated with appropriate veterinary care, OMT provides a comprehensive approach to managing biomechanical and compensatory factors that contribute to chronic SI dysfunction and its impact on performance.

Conclusion

Chronic sacroiliac dysfunction poses a unique challenge in performance horses because the effects of the dysfunction often extend well beyond the SI region itself. As horses adapt to changes in comfort, mobility, and biomechanical function, compensatory patterns may develop throughout the body, influencing posture, movement quality, and athletic performance. These adaptations can make both assessment and management more complex, particularly when secondary restrictions become more apparent than the original cause of dysfunction.

The resources reviewed in this paper support the concept that chronic SI dysfunction is frequently associated with compensatory changes involving multiple regions of the body. Research and osteopathic observations suggest that these adaptations may involve the pelvis, thoracolumbar region, cervical region, limbs, and associated myofascial structures, reinforcing the importance of evaluating the horse as a whole rather than focusing solely on a single anatomical region.

From an osteopathic perspective, the most important question is often not simply where dysfunction is present, but why it developed and how the horse has adapted to it over time. Understanding these relationships may help differentiate primary dysfunction from secondary compensation and provide a more complete picture of the factors influencing performance. Osteopathic manual therapy offers a complementary approach by combining detailed assessment with techniques to improve mobility, reduce abnormal tissue tension, and address compensatory restrictions that may contribute to ongoing dysfunction. When integrated with appropriate veterinary care and rehabilitation, this approach may help support more efficient movement, improved function, and long-term athletic performance. Ultimately, chronic SI dysfunction is not solely a problem of the pelvis. It is a condition that can influence the entire movement system, making comprehensive assessment and individualized management essential to supporting the performance horse.

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