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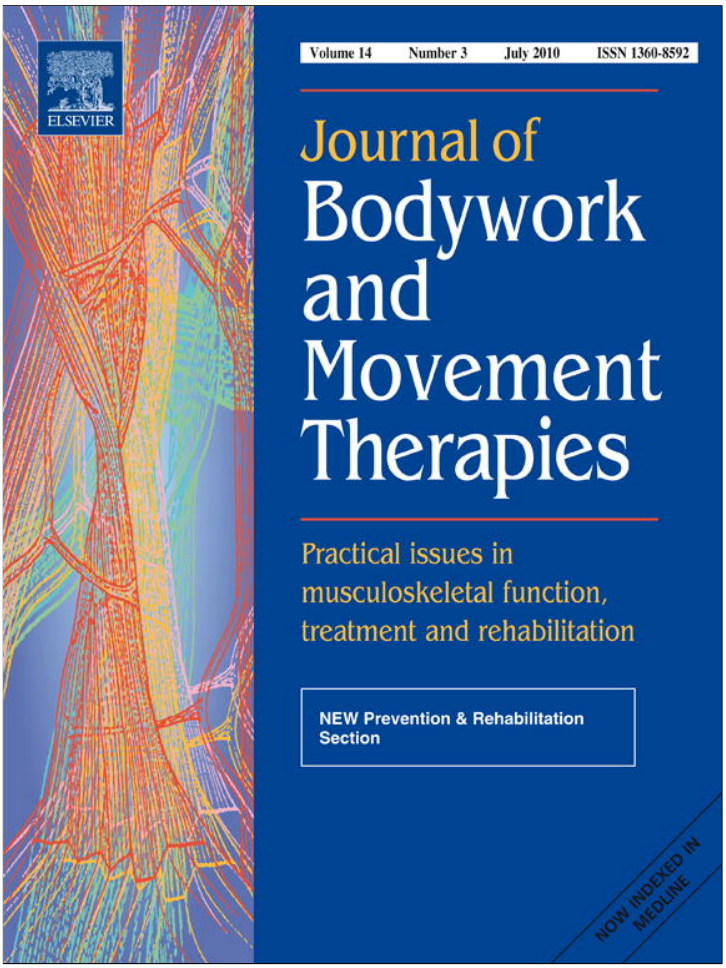

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POSTURAL PHYSIOLOGY

The Pelvic Crossed Syndromes: A reflection of imbalanced function in the myofascial envelope; a further exploration of Janda's work

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Summary Structurally, the sacrum–coccyx provides the dual roles of serving as the base of the spinal column while also forming part of the pelvic ring. Physiological movement control of the pelvis and the spine are functionally interdependent. In particular, intra-pelvic control, (that between the ilia and sacrum/coccyx in support and control of the forces and small movements within the pelvic ring) is fundamental to controlling its spatial organization as a whole and its control on the femoral heads, all of which directly influence spinal alignment and control mechanisms. This involves coordinated activity in the related neuro-myofascial systems in providing mechanisms of both intrinsic and extrinsic support and control.
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Janda proposed the concept of the Pelvic Crossed Syndrome as an underlying factor in the genesis and perpetuation of many low back pain syndromes (Janda, 1987; Janda and Schmid, 1987; Janda et al., 2007). Here, imbalanced muscle activity – tightness and overactivity of the hip flexors and low back extensors and a coexistent underactivity in the abdominals and glutei create a 'crossed pattern' of disturbed sagittal lumbopelvic posturo-movement alignment and control. While certainly evident in back pain populations, for the observant clinician it is not a universal finding.

Like Janda, our group has been interested in the validity of clinical pattern recognition which appears to also delineate another different, yet broad subgroup within the back pain population who share in common similar features of changed postural alignment and control. This sub-group displays a relative hyperactivity in the upper abdominal wall and piriformis/hamstrings with underactivity in the lower abdominals, deep hip flexors and low back extensors. This also creates an altered 'crossed pattern' affecting

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sagittal lumbopelvic alignment and control and has been described by Key et al. (2008b).

It is clinically apparent that most patients presenting with low back and pelvic pain syndromes display at least some of the features attributable to either of these two primary pictures of altered pelvic function. In Janda' s originally proposed Pelvic Crossed Syndrome, the pelvis is more posterior and this is associated with imbalanced coactivation of the trunk muscles with more dominant activity observed in the extensors. Key et al. (2008b) proposed this syndrome be re-termed the Posterior Pelvic Crossed Syndrome (Figure 1C). Conversely, in the other broad group, the pelvis is postured more anteriorly and this is associated with a predominant tendency to more axial flexor activity — described by Key et al. (2008b) as the Anterior Pelvic Crossed Syndrome (Figure 1B).

However, it is important for the clinician to also recognise that underpinning both primary pictures of pelvic posturo-movement dysfunction there is usually a related, common and clinically apparent fundamental deficit in the integrated and balanced control provided from the deep, innermost myofascial sleeve which sub-serves the foundations of lumbopelvic support and control.

Key et al. (2008a) proposed that the muscles of the body could for practical purposes be conceptually viewed as essentially consisting of two systems — a deep and a superficial systemic muscle system. They termed the deep system the Systemic Local Muscle System and proposed that this plays a critical role in underlying postural support and control.

It is hereby further proposed that in respect to healthy lumbopelvic function, an important part of this deep system is a continuous, largely internal three dimensional myofascial web, providing a scaffold of tensile inner

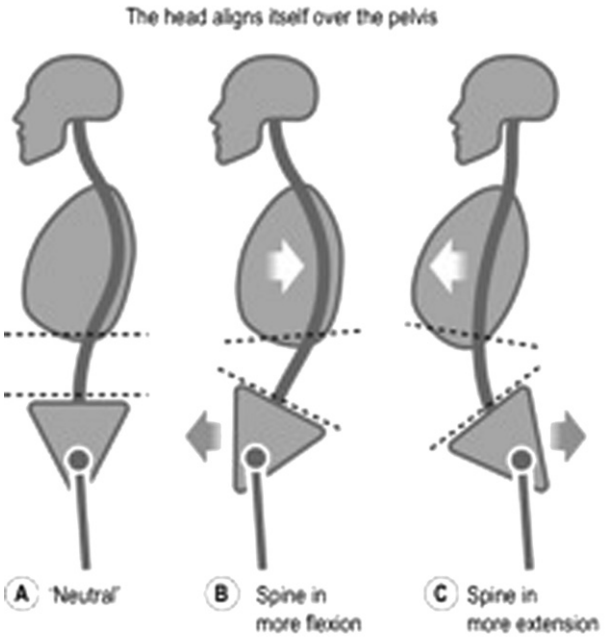

Figure 1 Altered control of pelvic position changes the alignment and control mechanisms throughout the spine. Reproduced from ''*Back pain: A movement problem*'' by Key, publishing early 2010. With permission from Elsevier.

support and stability and contributing to a structural and functional bridge between the lower torso and legs. It is suggested that these collective myofascial aggregations be termed the 'Lower Pelvic Unit' (LPU). This includes the obvious contractile elements for which there is accumulating evidence of deficient function in subjects with low back and/or pelvic pain — the transversus abdominus (Hodges and Richardson, 1996, 1998, 1999) multifidus (Hides et al., 1996) the diaphragm and pelvic floor muscles (O'Sullivan et al., 2002; Hodges, 2006). Impressions from clinical practice suggest inclusion also of the obturators, iliacus, psoas, and all their related and interconnecting fascial sheaths. Sound activity within this myofascial 'inner stocking' sustains many functional roles: — providing deep anterior support to the lower half of the spinal column; with the spinal intrinsics it contributes to lumbopelvic control (Hodges, 2004); while also contributing to the generation of IAP (Cresswell et al., 1994), continence and respiration (Hodges and Gandevia 2000) (Figure 2).

Importantly, it is further asserted that from a therapeutic perspective, co-operative activity within the LPU allows the modulation of discrete yet clinically apparent, fundamentally important intra-pelvic movements and spatial shifts. In helping to control our posturo-movements, it acts as the 'collective internal agonist' to balance the actions and forces created by activity of the 'outer antagonists'. This balanced coactivation within the LPU and between it and the large more superficial muscles provides control of the myo-mechanics and movement force couples necessary to allow the pelvis to be the initiator and driver of functional posturo-movement control of the torso on the legs. Control initiated from the base of the spine through the pelvis, directed via the ischia and coccyx, is essential in being able to effectively manage the delicate neuromuscular balance involved in being upright against gravity. It also enables one to draw upon on an endless array of options in the fluid control of movement including being able to create kinematically sound patterns of movement which support basic activities of daily living — bending over, lifting, reaching squatting, jumping and so on — all possible when the pelvis can act in its prime role as the centre of weight shift in the body. Balanced coactivation from the LPU provides internal stability to the pelvis as it swings and swivels on the femoral heads which is necessary in weight shift, load transfer and in controlling equilibrium. This is 'core control'.

Clinical relevance

The experienced clinician knows that seemingly subtle changes and differences in pelvic posturo-movement control can mean a lot in the presenting symptom picture of those with spinal pain and related disorders. Appreciation of the Pelvic Crossed Syndromes and the common associated dysfunction in the LPU helps the practitioner 'to see' and better understand what is driving the patients underlying problem and the likely needs in terms of retraining appropriate functional motor control. In the author's clinical experience, this is best addressed in the patient initially relearning specific activation of deficient elements within the LPU, establishing the important fundamental patterns of intra-pelvic control and

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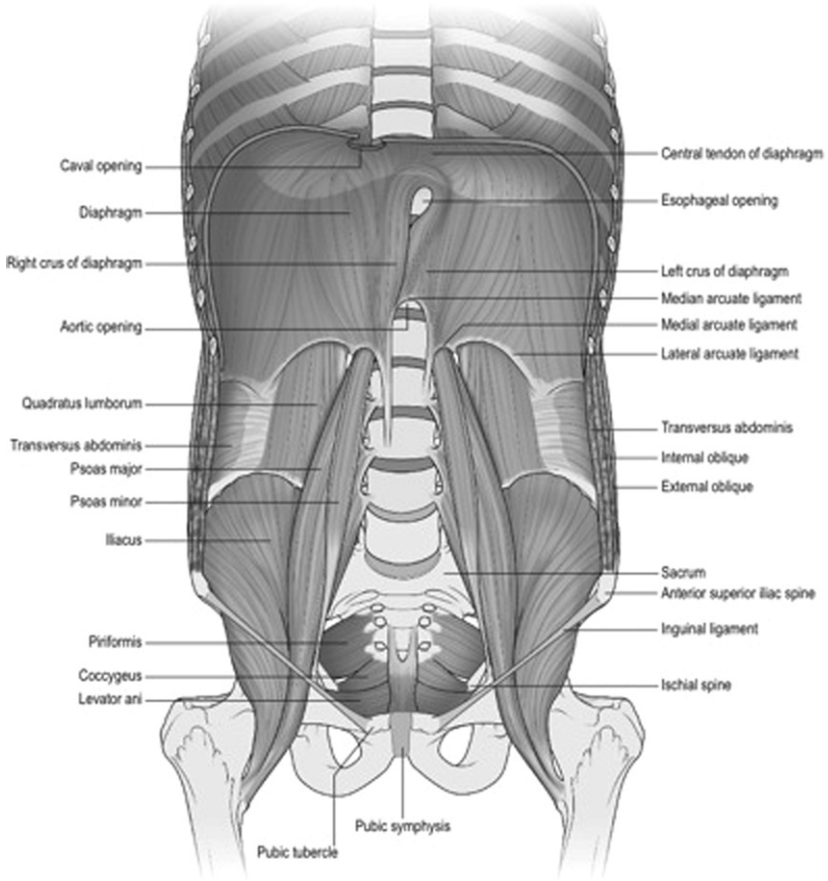

Figure 2 Much of the LPU involves a prevertebral and intra-pelvic myofascial web of support. Reproduced from *''Back pain: A movement problem''* by Key, publishing early 2010. With permission from Elsevier.

integrating these into basic functional patterns of movement control initiated from the pelvis. This will better ensure the likelihood of the patient achieving more functionally appropriate and 'real core control'.

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