

THE PELVIC CROSSED SYNDROMES: A REFLECTION OF IMBALANCED FUNCTION IN THE MYOFASCIAL ENVELOPE; A FURTHER EXPLORATION OF JANDA'S WORK.

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1. INTRODUCTION:

Structurally, the sacrum-coccyx serves the dual roles of the support base of the spinal column and also forms part of the pelvic ring. Physiological posturo-movement control of the pelvis and the spine are functionally interdependent. In particular, **intrapelvic control, its spatial organization as a whole and its control on the femora directly influence spinal alignment and control mechanisms.** Balanced neuro-myofascial activity ensures mechanisms of both intrinsic and extrinsic pelvic support and control

Professor Vladimir Janda^{1,2,3} proposed the concept of the Pelvic Crossed Syndrome as an underlying factor in the genesis and perpetuation of many low back pain syndromes. A 'crossed pattern' of imbalanced muscle activity disturbs sagittal lumbopelvic posturo-movement alignment and control. While certainly evident in back pain populations, it is not a universal finding.

Clinical practice delineates another group who display a different, almost opposite 'cross pattern' of altered myofascial activity also affecting sagittal lumbopelvic alignment and control.

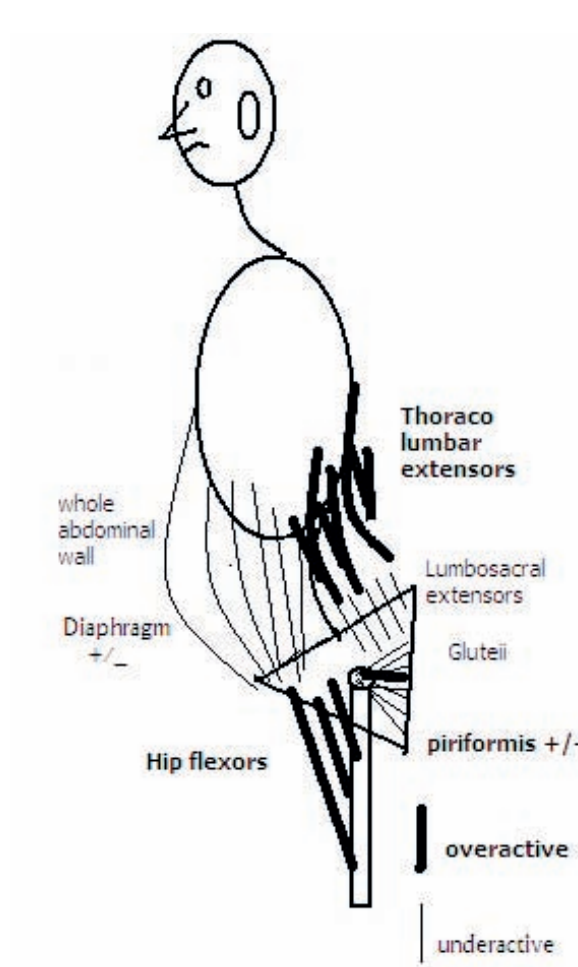


Fig. 1: Janda's original Pelvic Crossed Syndrome (PPXS)

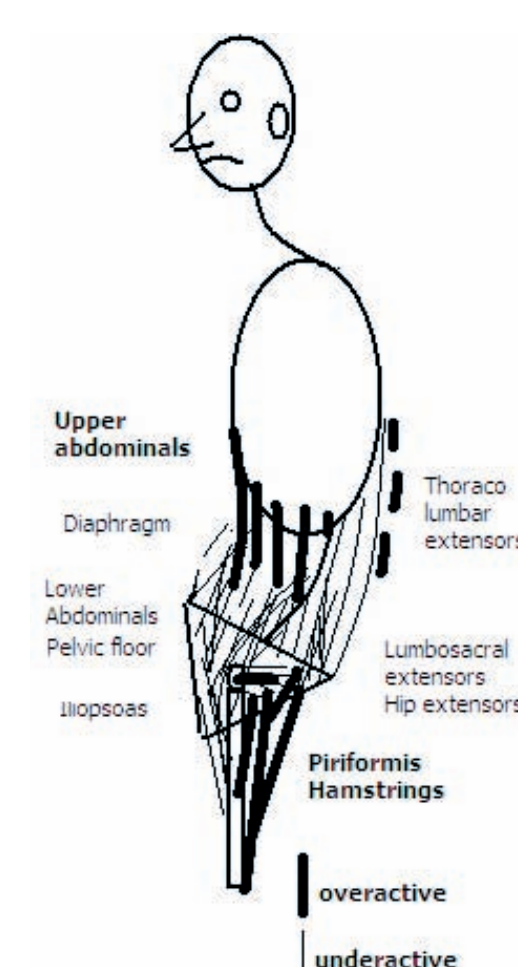


Fig. 2: Another common pattern of altered 'crossed pattern' control Crossed Syndrome (APXS)

2. HYPOTHESIS:

Clinically, most subjects with LBP and related pelvic pain syndromes predictably demonstrate disturbed patterns of spatial and intrapelvic posturo-movement control. Basically, two primary patterns of lumbopelvic dysfunction are apparent: conceptualized as **The Pelvic Crossed Syndromes (PXSs)**:

- In Janda's Pelvic Crossed Syndrome the pelvis is more posterior and anteriorly rotated: associated with more dominant activity in the axial extensors and hip flexors: here re-termed the **Posterior Pelvic Crossed Syndrome (PPXS)**⁴.
- Conversely, in the other group, the pelvis is postured more anteriorly in posterior rotation: associated with a predominant tendency to axial flexor and hip extensor activity: the **Anterior Pelvic Crossed Syndrome (APXS)**⁴. This subgroup may be more common

The 'pure' PXS picture may not always be apparent: often a Mixed Syndrome with some features of both PXSs, yet an underlying dominant tendency

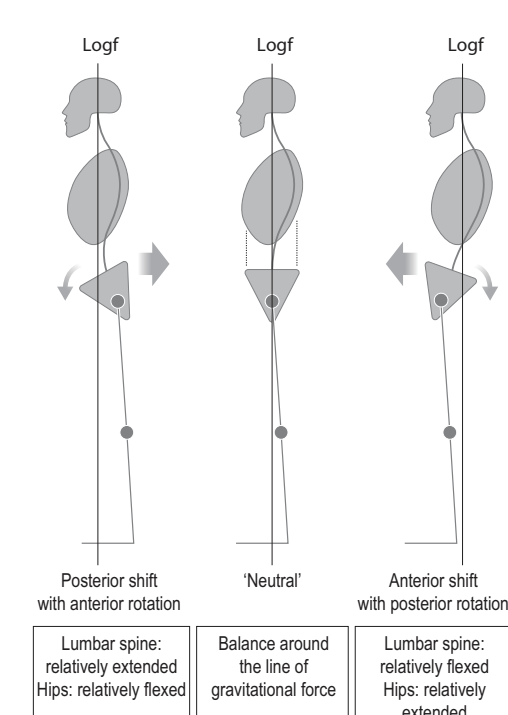


Fig. 3 Altered pelvic position influences the body's neuromuscular response to the gravitational line of force. From: Back Pain - A movement problem by Key, publishing early 2010. With permission from Elsevier LTD elsevierhealth.com

Importantly, underlying the PXSs is a related deficit in the integrated and balanced control provided from the deep innermost myo-fascial sleeve collectively termed the **Lower Pelvic Unit (LPU)**. This includes the diaphragm, iliacus, psoas, transversus, obturators, pelvic floor muscles and the lumbar intrinsic. Research has begun to demonstrate

defective activity of some muscles within this^{6,7,8,9,10,11,12}. Normally, modulated activity in this continuous 'inner stocking' contributes towards many functions but in particular, it **provides intrinsic internal support and stability for optimum control of pelvic posturo-movement patterns = ACTUAL 'CORE CONTROL'**

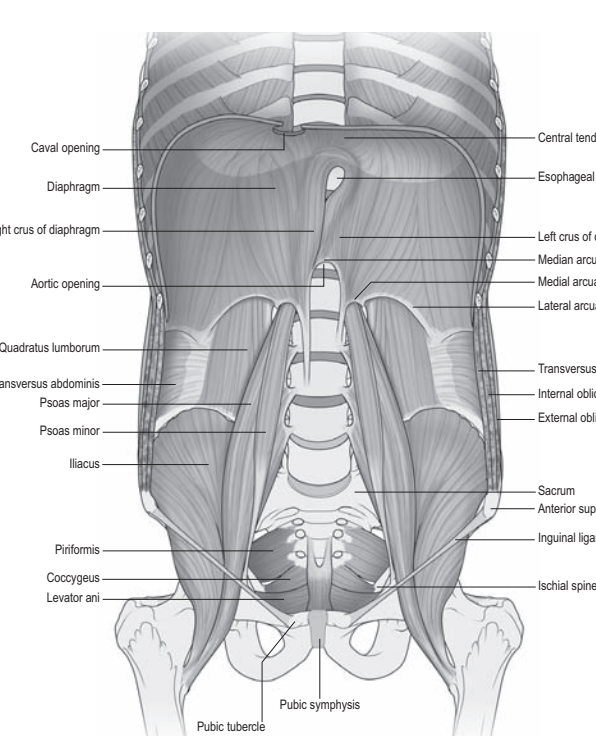


Fig. 4: Much of the LPU involves a web of prevertebral and intrapelvic support. From: Back Pain - A movement problem by Key, publishing early 2010. With permission from Elsevier LTD elsevierhealth.com

3. CLINICAL IMPLICATIONS OF THE PELVIC CROSSED SYNDROMES

The PXSs and related LPU dysfunction → both an over reliance on the 'outer' myo-fascial systems &/or the passive tissues → predictably compromise numerous functional mechanisms as follows:

- Altered 'posture' & related patterns of motion: ↓ dynamic pelvic-spinal antigravity alignment and control ⇒ more end range positions & 'postural strain' carried into patterns of movement
 - ↓ Patterns of intrapelvic pelvic control ⇒ compromised internal stability of the pelvis limiting its 'swing & swivel' on the femoral heads necessary in weight shift, load transfer and in controlling equilibrium
 - ↓ Spatial pelvic control = ↓ effective weight shift - multiplanar acetabular rotations involve movement force couples highly dependent upon LPU activity
 - ⇒ ↓ Role of the pelvis as an effective & adaptable base of support for the spine
 - ⇒ imbalanced patterns of axial flexor/extensor activity with ↓ coactivation & compensatory axial 'holding patterns'
 - ↓ Variety in posturo-movement (P/M) strategies - 1° move in sagittal plane with more predictable P/M strategies ⇒ blocks more ideal triplanar control
 - ↓ Lumbopelvic control & initiation of movements from the base of the spine
 - ↓ Hip function as the axis of triplanar weight shift & movement initiation - (open and closed chain) ⇒ compensations higher up in the spine
 - ↓ Deep anterior support to lower half of the spinal column & ↓ stability for the diaphragm - postural & respiratory role
 - ↓ Quality in generation of IAP, & control of continence and respiration.
- → → → Predictable onset of various lumbo-pelvic pain syndromes over time

4. EFFECTIVE WEIGHT SHIFT THROUGH THE PELVIC BASE OF SUPPORT IS IMPORTANT IN PATTERNS OF SPINAL CONTROL

↓ Sagittal and frontal plane weight shift through the pelvis ⇒ predictable alterations in axial patterns of movement which subserve simple repetitive ADL actions e.g. forward bend pattern (FBP); sitting; standing & walking.

Sagittal weight shift: fundamental to bending forward, lifting; sitting; sit to stand

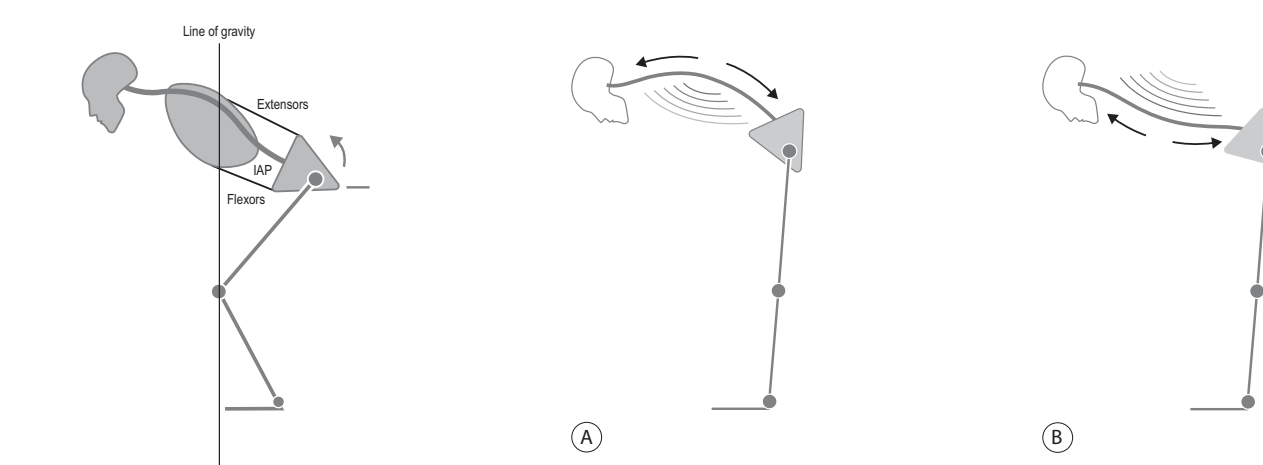


Fig. 5 Diagrammatic view of ideal (L) and altered patterns of sagittal weight shift in FBP; APXS (a); PPXS (b) From: Back Pain - A movement problem by Key, publishing early 2010. With permission from Elsevier LTD elsevierhealth.com



Fig. 6-8 Ideal (L) and altered sagittal weight shift APXS (Middle); PPXS (R)

Frontal plane weight shift: fundamental to walking; weight shift in sitting



Fig. 9 & 10 Ideal (L) and ineffective frontal plane pelvic weight shift (R) in standing