

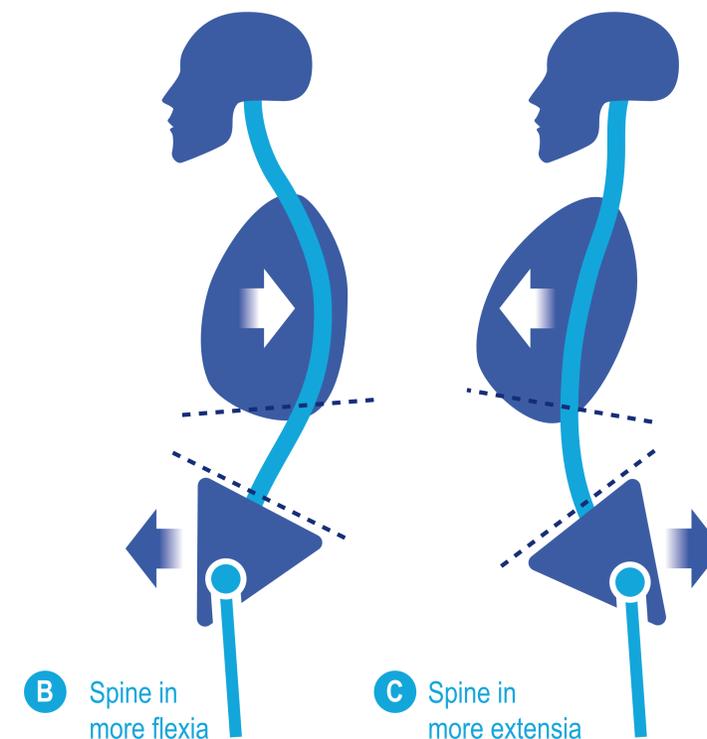
# The 'Pelvic Crossed Syndromes':

assist clinical sub-group classification & facilitate the assessment, diagnosis & management of patients with spino-pelvic pain disorders

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## Relevance: Proposal:

- Subjects with low back and pelvic pain disorders are a heterogeneous group and the identification of clinical subgroups is considered important in achieving improved diagnostic, intervention and research outcomes<sup>1,2,3,4,5,6</sup>.
- Some current clinical classification approaches rely upon sub-grouping patients based upon establishing consistent directional patterns of symptom aggravating and easing movements which subsequently inform patient management<sup>2,4,7,8,9</sup>. One approach requires multiple movement tests before the patient can be classified into a particular subgroup<sup>10</sup>. A recent study<sup>11</sup> found that only 32% of a CNLBP cohort exhibited consistent directional patterns of spinal movement during self-reported aggravating activities. These authors claimed that this is no different to that expected by chance; possibly suggesting that over-reliance on this aspect of the assessment may preclude other important physiological clues.
- Janda<sup>12</sup> argued that simply observing postural alignment, pelvic position and muscle contours tells a lot about the subject's motor function. He described the Pelvic Crossed Syndrome as an expression of altered spino-pelvic posturo-movement control. Disturbed patterns of axio-pelvic neuro-muscular activity create altered loading stresses on the joints and soft tissues and the likely development and perpetuation of various spino-pelvic pain and related disorders in time.
- Clinical practice also delineates another different, yet common picture of spino-pelvic dysfunction - implicating **two primary pictures of posturo-movement impairment which underlie most axio-pelvic pain syndromes**. Utilising the available evidence and extrapolating Janda's original model, these have been further developed and re-termed the Posterior Pelvic Crossed Syndrome - his original concept (PPXS) and the Anterior Pelvic Crossed Syndromes (APXS)<sup>13,14,15,16</sup>.
- Clinically, most patients with pelvic and spinal pain disorders appear to fall into 'clusters' around these two primary subgroups of posturo-movement dysfunction.
- Each Crossed Syndrome picture is characterized by a particular altered spino-pelvic posture upon which all other movements are built. **We can expect typical altered motor control strategies and changed kinematic patterns of movement creating somewhat predictable musculo-skeletal 'directional strain patterns'**.
- Common to both Pelvic Crossed Syndromes is an associated deficit in the deep muscle system<sup>13,14,15</sup> - particularly the inner myofascial sleeve - "The Lower Pelvic Unit"<sup>15,16</sup>, further compromising control of important, inter-dependent, functional mechanisms necessary for effective foundation control and healthy posturo-movement function:
  - Respiration
  - The generation of IAP and related postural control
  - The control of the pelvis on the legs



Altered axio-pelvic alignment changes muscle activation patterns and the thorax and pelvis assume more oblique relationships. Illustration from: Back Pain - A movement problem by Key, published 2010. With permission from Elsevier LTD [www.elsevierhealth.com](http://www.elsevierhealth.com)

## Implications:

Appreciating the Pelvic Crossed Syndromes:

- Assists the clinical assessment.
- Facilitates a 'dys/functional diagnosis' based upon the patient's actual neuro-myo-articular impairments - the likely mechanism driving the pain disorder<sup>2</sup>.
- Indicates the direction of appropriate manual interventions
- Allows improved sub group allocation for back pain research and interpreting outcomes
- Aids our understanding of the development and perpetuation of the patient's presenting pain disorder and provides prognostic clues.
- Provides insights towards more appropriate and effective exercise protocols for both prevention and rehabilitation

In essence, the principal clinical posturo-movement features which distinguish each Pelvic Crossed Syndrome can be broadly summarised as follows:

Distinguishing Features	PPXS	APXS
Habitual pelvic posture away from spatial 'neutral'	<b>Posterior</b> shift from line of gravity with anterior tilt	<b>Anterior</b> shift from line of gravity with posterior tilt
Habitual postures influence movement patterns	↓ Anterior pelvic shift/ hip extension; ↑ T/L lordosis	↓ Posterior pelvic shift/ hip flexion; ↓ L/S lordosis
Axial flexor /extensor muscle activity balance	↓ coactivation F/Es Axial extensor dominance 1° thoracolumbar;	↓ coactivation F/Es Axial flexor dominance 1° thoracolumbar
Antero-lateral abdominal wall (ALAW) activity	↓ whole abdominal wall +	↓ lower ALAW; ↑ upper ALAW
Extensor system activity	↑ :T/L > L/S regions spine	↓ :L/S > T/L regions spine
Forward bending & sitting kinematic patterns	✓ hip flexion/posterior shift pelvis; Rely heavily on ↑ superficial axial extensor muscle 'holding'	↓ hip flexion/posterior shift pelvis; Rely more on passive structures ⇒ axial collapse & ↑ L/S flexion
Extension / reach pattern	Dominant spinal extensor strategies > pelvic hip	Dominant use of pelvic hip strategies > spinal
More likely dominant axial regional dysfunction	Thoracolumbar spine > L/S spine & pelvis	Lumbosacral & pelvis > T/L - spinal column
Most likely dominant pain syndromes <sup>17,18</sup>	Back pain > pelvic girdle pain; also including referral patterns to anterior hip & knee	L/sacral and pelvic girdle pain > 'back pain'; also including referral patterns to posterior lower limb/foot

The clinical veracity of the pelvic Crossed Syndromes is partly supported by a study by Van Wingerden et al<sup>17,18</sup> which found that the standing postures and forward bending patterns differed between subjects with chronic pelvic girdle and chronic low back pain.

