

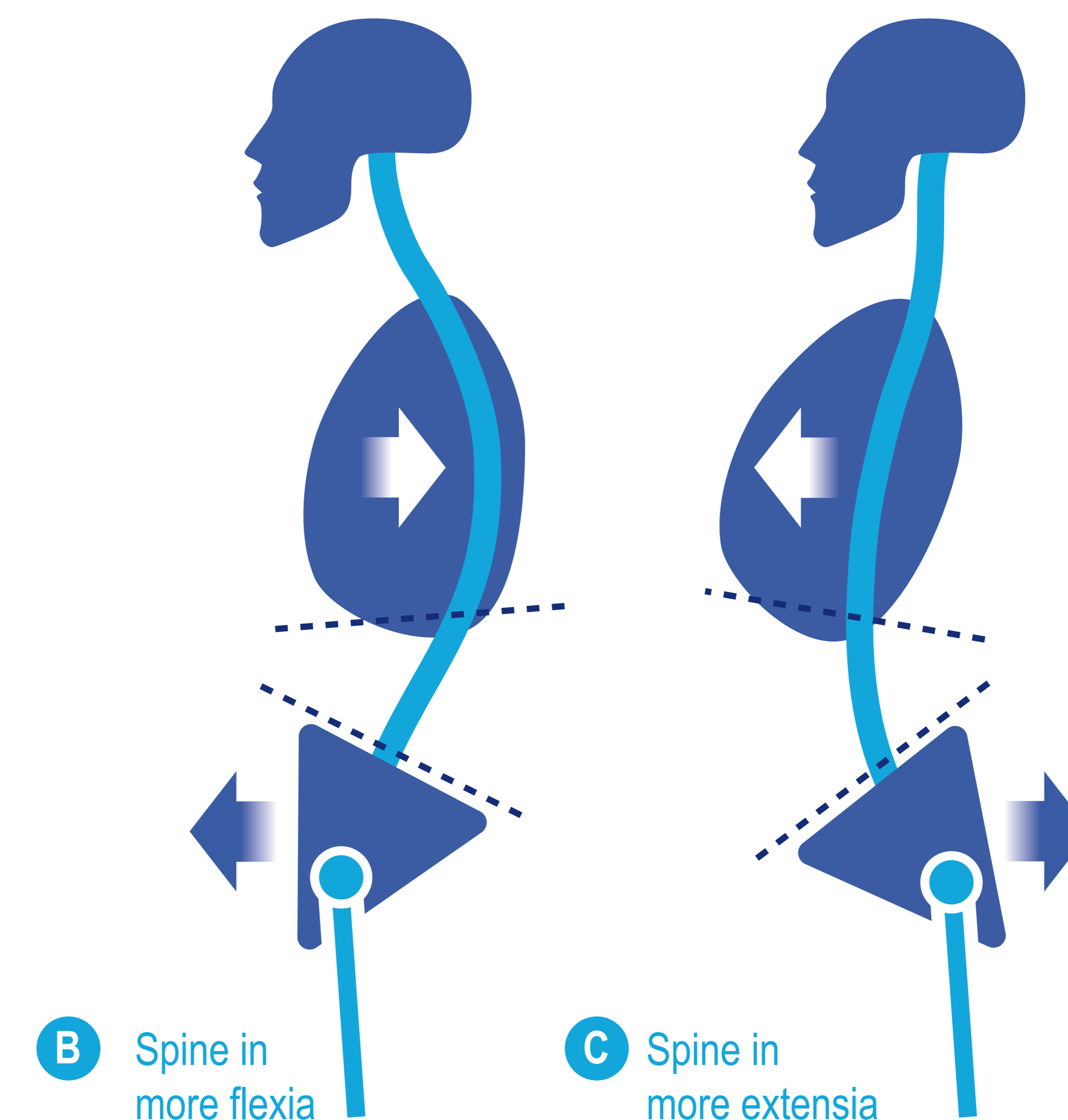
The 'Pelvic Crossed Syndromes':

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^{1,2,3,4,5,6}.
- 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^{2,4,7,8,9}. One approach requires multiple movement tests before the patient can be classified into a particular subgroup¹⁰. A recent study¹¹ 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.
- Janda¹² 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)^{13,14,15,16}.
- 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^{13,14,15} - particularly the inner myofascial sleeve - "The Lower Pelvic Unit"^{15,16}, 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

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 disorder².
- 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'	Posterior shift from line of gravity with anterior tilt	Anterior 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 ^{17,18}	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^{17,18} which found that the standing postures and forward bending patterns differed between subjects with chronic pelvic girdle and chronic low back pain.

