

LUMBOPELVIC RHYTHM

Hip on Pelvic & Spine Movement
Vs
Spine & Pelvic on Hip Movement

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BY THE END OF THIS SESSION YOU SHOULD FEEL COMFORTABLE

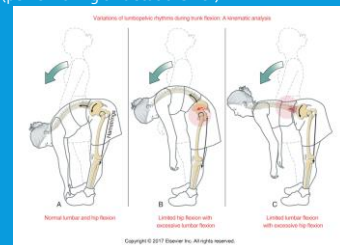
- Discussing lumbopelvic rhythm during trunk and hip movement
- Apply your understanding to
 - Clinical assessment
 - Treatment and rehabilitation
- Of lumbo-pelvic-hip pain and dysfunction

LUMBOPELVIC RHYTHM

- In addition to the hip joint the lumbar spine provides the major flexion and extension axis point in the body
- The kinematic relationship between lumbar spine and hip joints during flexion and extension has been referred to as 'lumbopelvic rhythm'
- Ipsidirectional – lumbar spine and pelvis move the same direction
- Contradirectional - move in opposite direction
- Good starting point for assessment movement in patients with pain and stiffness
- Focus of observations
 - Abnormal movement and joint interactions

FLEXION VARIATIONS

- Standing forward flexion
 - 40° lumbar flexion performed nearly simultaneously with 70° hip flexion (pelvis moving on a static femur)



FLEXION VARIATIONS

- Limited hip flexion
 - ? Tightness in hamstrings
- Increased demand on lumbar flexion
- Exaggerated Lxsp flexion may cause overstretch & subsequently weaker the posterior connective tissue (e.g. TLF)
- Reduced ability to restrict further flexion
- Larger load on IVD

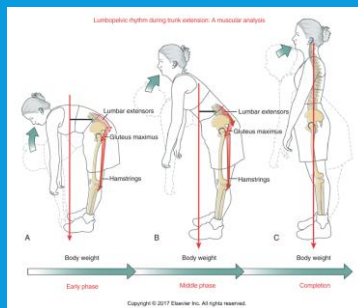


FLEXION VARIATIONS

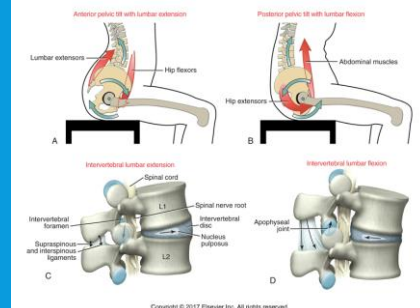
- Limited Lxsp Flexion
- Increased hip flexion component
- Greater demand on hip extensor muscles
- Hip joint subjected to increased compressive loads
- If hip pathology already present (e.g. OA, joint surface changes) movement may be painful and may accelerate degenerative process



TRUNK EXTENSION VARIATIONS

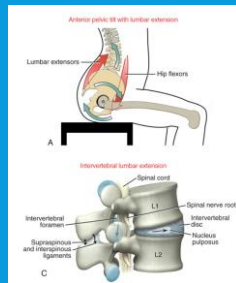


THE EFFECT OF PELVIC TILT ON LUMBAR KINEMATICS



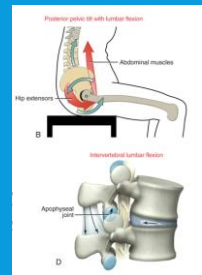
ANTERIOR PELVIC TILT AND INCREASED LUMBAR LORDOSIS

- Caused by contraction of hip flexor and back extensor muscles
- Weakness of hip extensors and abdominal muscles
- Exaggerated lordosis
 - Increased compression in lumbar facet joints
 - Increased contact pressure between posterior elements of lumbar vertebrae
 - Increased sacrohorizontal angle
- Increased shear force at lumbosacral junction
 - Spondylolisthesis

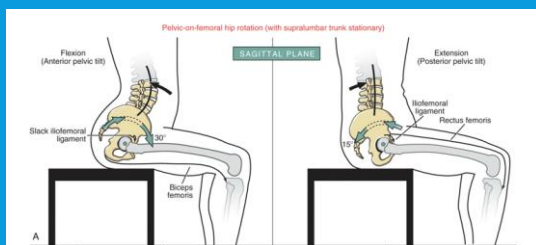


POSTERIOR PELVIC TILT AND REDUCED LUMBAR LORDOSIS

- Active posterior tilt created by:
 - Contraction of hip extensors and abdominal mm
 - Weakness in hip flexors and lumbar extensors
 - Lxsp flexion
 - Disc load



PELVIC-ON-FEMUR MOVEMENT



SUMMARY

- Lumbopelvic rhythm describes the kinematic relationship between lumbar spine and hip joints during flexion and extension
- Ipsidirectional LPR
 - Standing
 - Flexion – 40° Lxsp, 70° hip
 - Extension – initiated by hip extensors, followed by lumbar erectors
- Contradirectional
 - Sitting
 - Anterior tilt, additional 30° hip FLXN, increased lordosis
 - Posterior tilt, additional 10-20° hip EXTN, reduced lordosis