

SNS COLLEGE OF PHYSIOTHERAPY

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Coimbatore – 641035

COURSE NAME : BIOMECHANICS

SUBJECT CODE : 6277

TOPIC : HIP JOINT

EMPATHIZE

Hip joint function is essential for:

Standing balance

Walking, running, stair climbing

Sitting and rising from sitting

Dysfunction leads to:

Low back pain

Altered gait

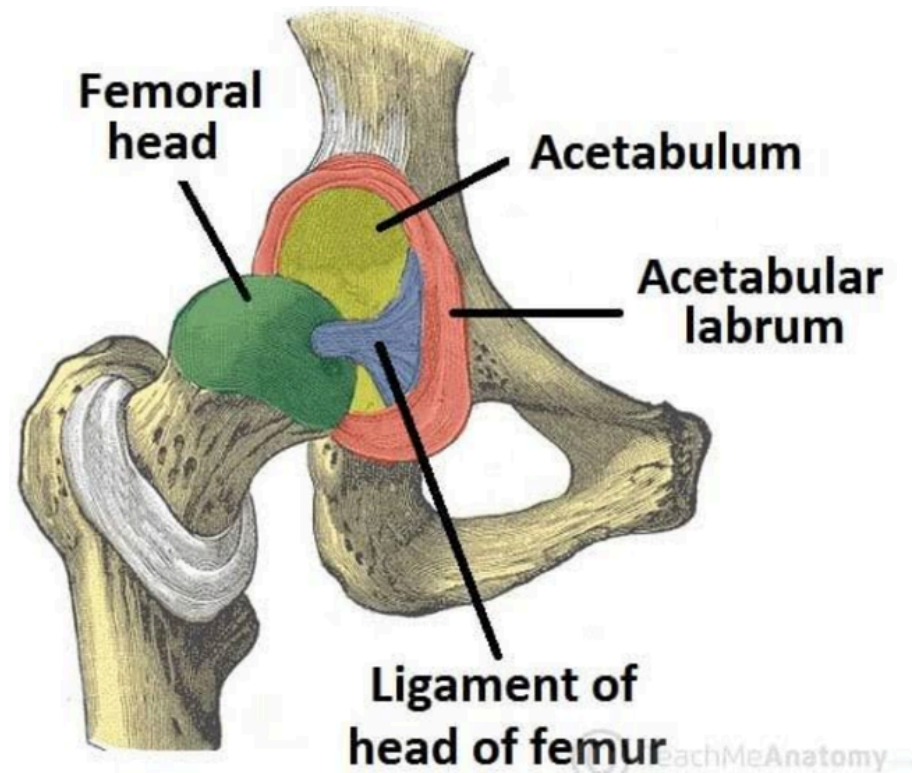
Increased energy expenditure

Common clinical relevance:

Postural deviations

Pelvic asymmetry

Lumbo-pelvic disorders.



IDEATE

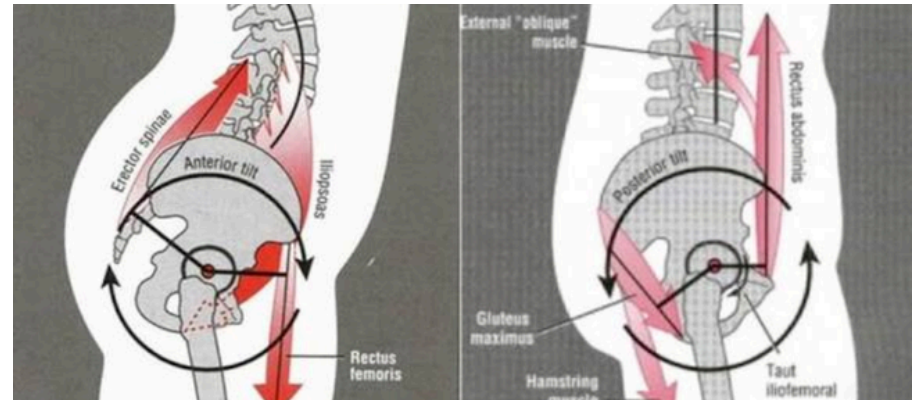
Movements of hip cannot occur in isolation

There is a dynamic interaction between:

Hip joint

Pelvis

Lumbar spine



Known as the lumbo-pelvic-hip complex

Ensures:

Smooth movement

Reduced stress on individual joints

DEFINE AND EXPLAIN

The hip joint functions to:

Connect the lower limb to the trunk

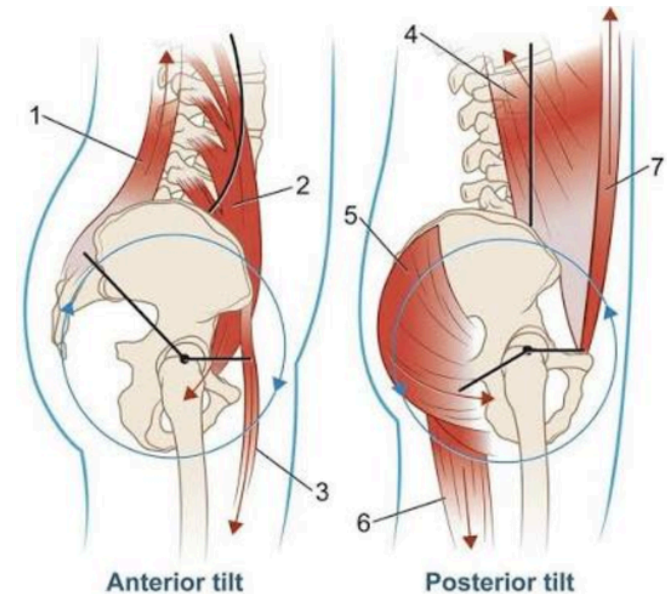
Allow movement between pelvis, femur and lumbar spine

Provides:

Mobility for locomotion

Stability for weight bearing

Acts as a link between upper and lower body mechanics



- | | |
|-------------------|---------------------|
| 1. Erector spinae | 4. External oblique |
| 2. Iliopsoas | 5. Gluteus maximus |
| 3. Sartorius | 6. Hamstring |
| | 7. Rectus abdominis |

ANTERIOR & POSTERIOR PELVIC TILTING

Anterior Pelvic Tilt

Pelvis tilts forward

Increased lumbar lordosis

Associated with:

Tight hip flexors

Weak abdominal muscles

Posterior Pelvic Tilt

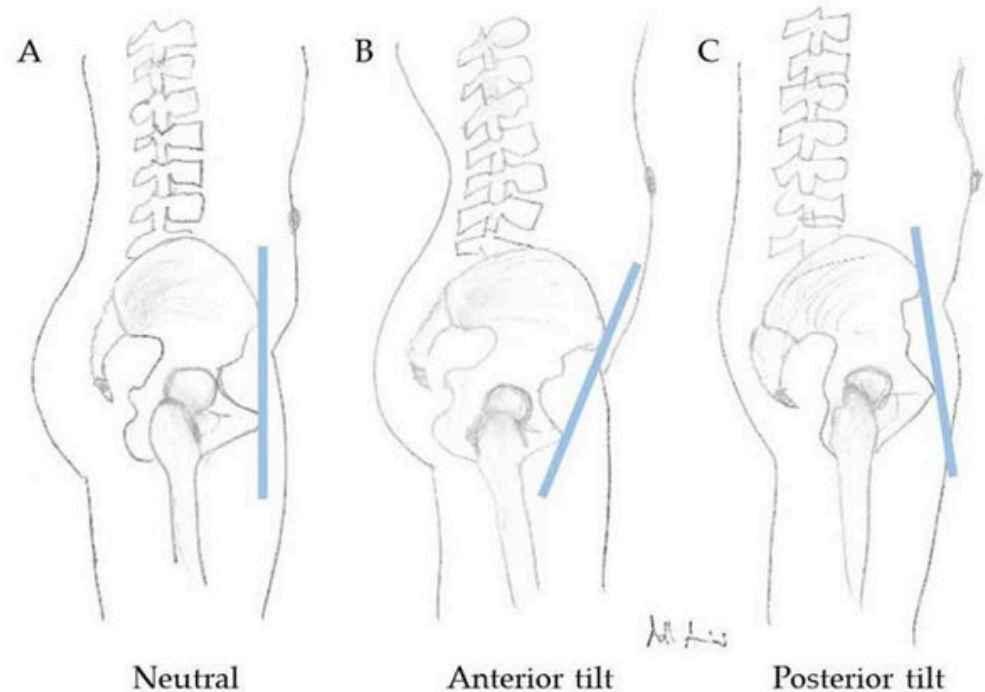
Pelvis tilts backward

Flattened lumbar spine

Associated with:

Tight hamstrings

Weak hip flexors



LUMBO-PELVIC RHYTHM

Coordinated movement between:

Lumbar spine

Pelvis

Hip joint

Occurs during

Forward bending

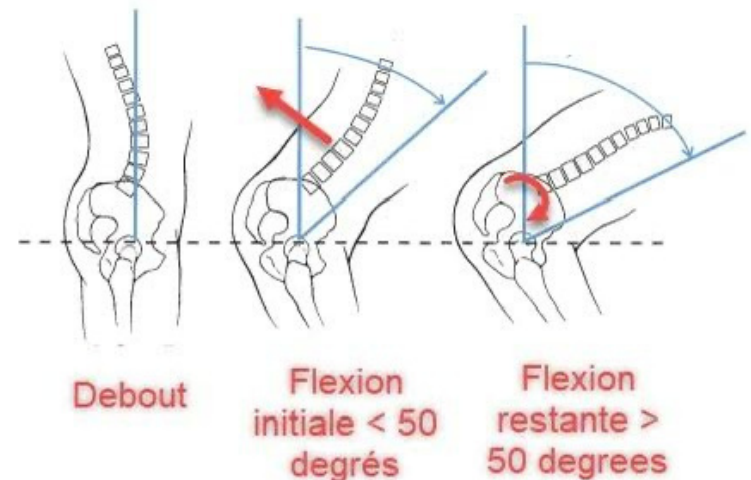
Lifting activities

Purpose:

Distributes move

Prevents excessive stress on lumbar spine

Altered rhythm increased injury risk



LATERAL PELVIC TILTING & PELVIC ROTATION

Lateral Pelvic Tilt

Occurs in single-leg stance

Controlled by hip abductors of stance limb

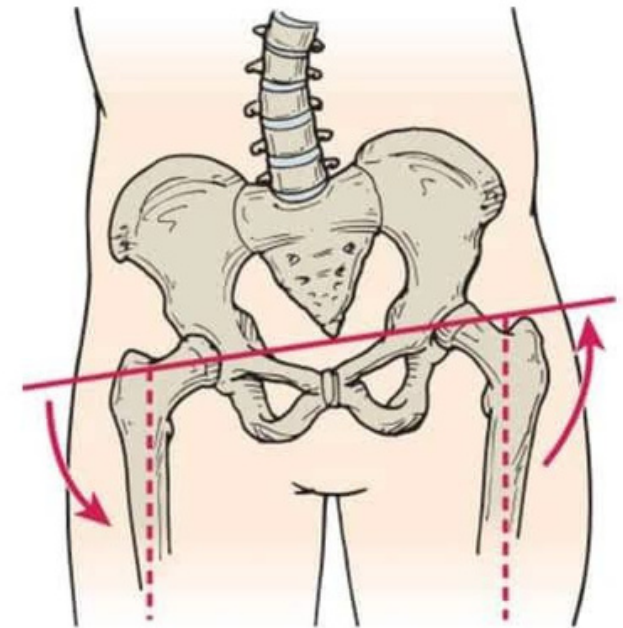
Excessive tilt indicates abductor weakness

Pelvic Rotation

Occurs in transverse plane

Seen during gait

Increases step length and walking efficiency

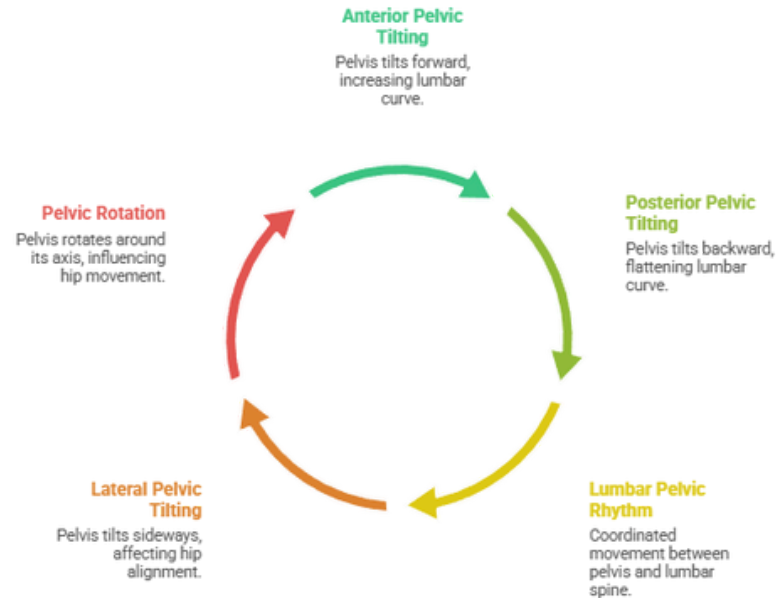


A

Lateral pelvic tilt

FLOW CHART

Hip Rotation Cycle



Made with  Napkin

In class assessment

- 1. Explain the concept of hip-pelvis-lumbar spine coordination in functional movements.**
- 2. Define anterior pelvic tilt and describe its movement components at the pelvis and lumbar spine.**
- 3. Define posterior pelvic tilt and explain its functional significance during daily activities.**
- 4. Describe the muscles responsible for controlling anterior and posterior pelvic tilting.**
- 5. Explain the lumbar-pelvic rhythm during forward trunk flexion.**

In class assessment

- 6. Describe the lumbar-pelvic rhythm during trunk extension from a flexed position.**
- 7. Define lateral pelvic tilt and explain how it is controlled during single-limb stance.**
- 8. Explain the role of hip abductors in maintaining pelvic stability during gait.**
- 9. Describe pelvic rotation in the transverse plane and its contribution to efficient walking.**
- 10. Explain how abnormal hip joint mechanics and pelvic motion can affect lead to dysfunction.**

Thank you

