SNS COLLEGE OF PHYSIOTHERAPY

AffiliatedToTheTamilNaduDr.MGRMedicalUniversity,Chennai
Coimbatore– 641035

COURSE NAME : BIOMECHANICS

SUBJECT CODE : 6277

TOPIC : HIP JOINT

EMPATHIZE

Important in:

Arthritis

Post-fracture care

Reduces pain and improves mobility

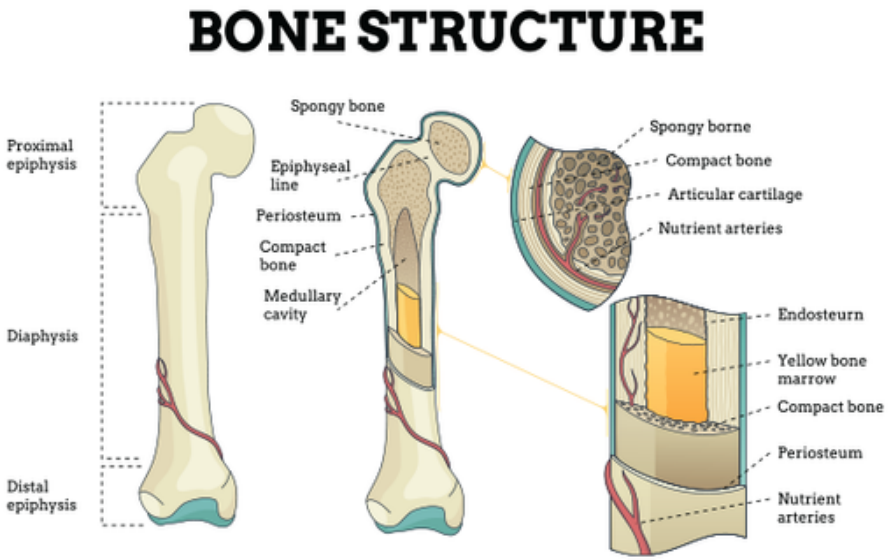
IDEATE

Used in:

Gait training

Cane prescription

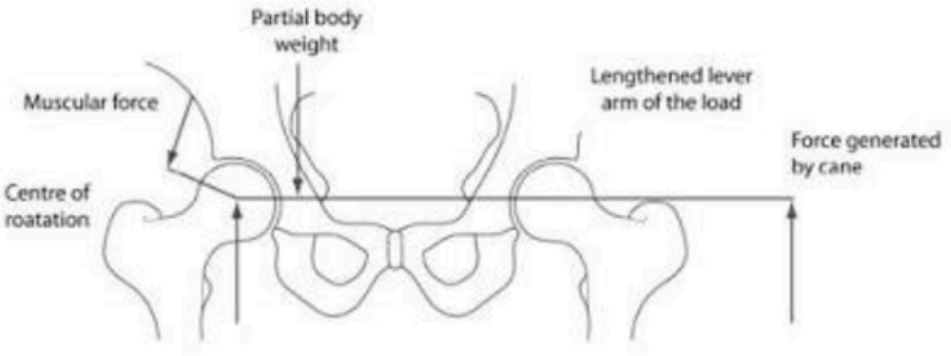
Pain management



DEFINE AND EXPLAIN

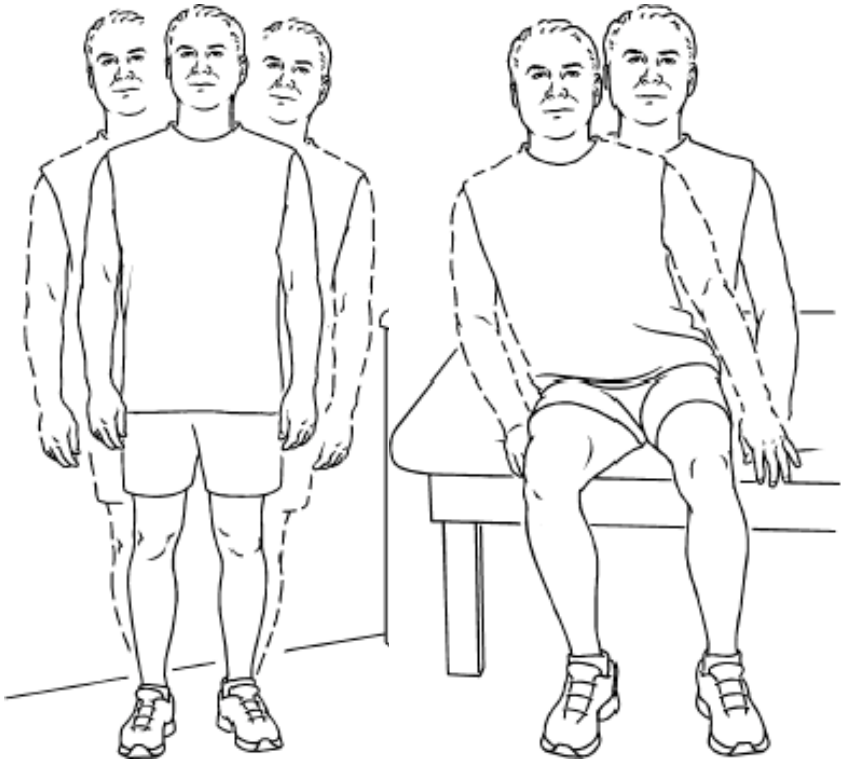
Reduction of forces means:

Decreasing joint reaction force Reducing stress on hip joint management



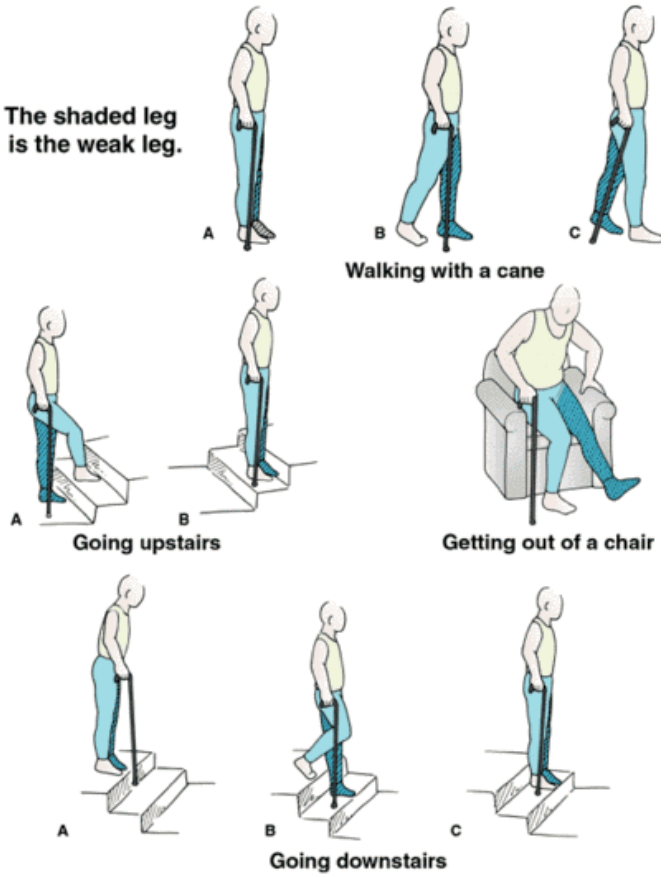
WEIGHT SHIFTING

- **Trunk shifted toward stance limb**
- **Reduces body-weight moment arm**
- **Decreases abductor force**



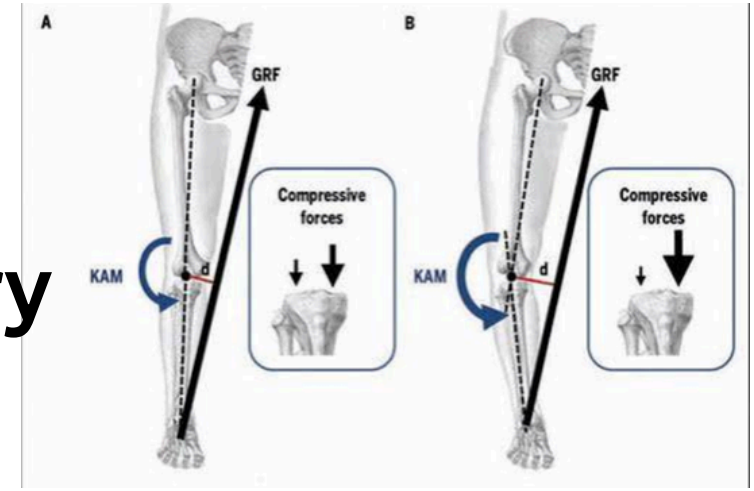
USE OF CANE

- **Cane held in opposite hand**
- **Acts as external support**
- **Reduces hip joint load**

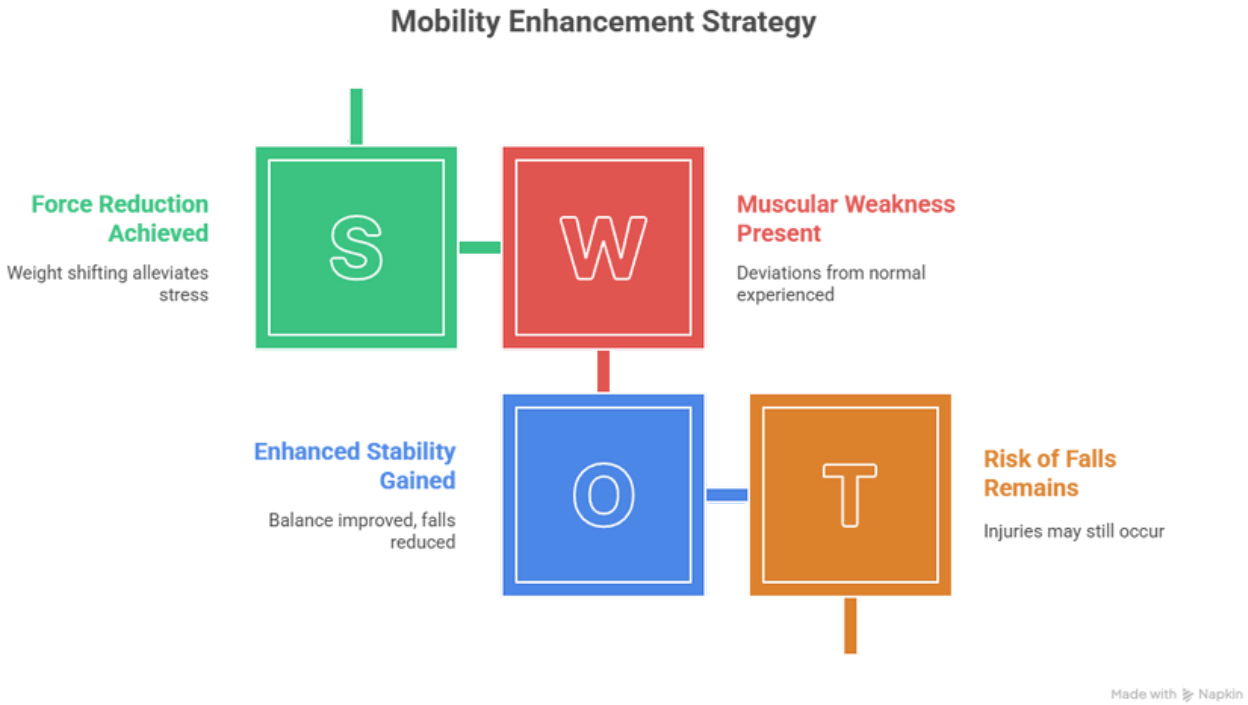


MUSCLE WEAKNESS

- **Weak abductors increase joint stress**
- **Leads to compensatory trunk lean**
- **Causes abnormal gait**



FLOW CHART


Mobility Enhancement Strategy
Force Reduction Achieved
Weight shifting alleviates stress
S
W
Muscular Weakness Present
Deviations from normal experienced
Enhanced Stability Gained
Balance improved, falls reduced
O
T
Risk of Falls Remains
Injuries may still occur
Made with Napkin

In class assessment

1. Explain the forces acting on the hip joint during single-limb stance.

2. Describe how lateral weight shifting reduces the load on the hip joint.

3. Explain the biomechanical principle behind reduction of hip joint reaction force by weight shifting.

4. Describe the effect of using a cane on hip joint forces.

5. Explain why a cane is advised to be used in the hand opposite to the affected hip.

In class assessment

6. Describe the changes in hip joint forces when hip abductor muscles are weak.

7. Explain Trendelenburg gait as a deviation caused by muscular weakness.

8. Describe compensatory mechanisms adopted to reduce hip joint forces in abductor weakness.

9. Explain how bony abnormalities of the hip affect load transmission and stability.

10. Describe the clinical significance of understanding force reduction strategies in hip pathology.

Thank you