The Pelvic Girdle

A. General Structure & Function
B. Structure & Function of Specific Joints
C. Muscular Considerations
D. Specific Functional Considerations
E. Common Injuries
The Hip and Pelvic Girdle

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General Structure: Pelvic Girdle

- L/R Pelvic Bones
- Fusion of: ilium, pubis, ischium
- 3 Joints: pubic symphysis, 2 sacroiliac
General Structure: The Hip Joint

- Hip Joint: union of acetabulum of pelvis and head of femur
- Stable joint, great mobility
- Surrounded by several large muscles
Structural Factors that Affect Girdle Function: Angle of Inclination

- Larger at birth, decreases with age...why?
- Hip abductors?
- Length of limb?
- Compression vs. Shear?

[Diagram showing angles of inclination for normal, Coxa Varus, and Coxa Valga]
Structural Factors that Affect Girdle Function: Angle of Anteversion

- Angle of anteversion
- Gluteus Maximus…ext. rotation?
Functional Anatomy of the Hip Joint: Acetabulum Alignment

Center-Edge Angle

Acetabular Anteversion Angle
General Function

☐ To provide stability for weight bearing
☐ To allow for mobility of the leg
☐ Load transmission
Movements of the Hip Joint

- Flexion and Extension
- Abduction and Adduction
- External Rotation and Internal Rotation
The Hip and Pelvic Girdle

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Kinematics of the Hip Joint

- Femoral-on-Pelvic Osteokinematics
- Pelvic-on-Femoral Osteokinematics
Kinematics of the Hip Joint

Femoral-on-Pelvic Osteokinematics:

1. Flexion and Extension in Sagittal Plane
Kinematics of the Hip Joint

Femoral-on-Pelvic Osteokinematics:

- Abduction and Adduction in the Frontal Plane
Kinematics of the Hip Joint
Femoral-on-Pelvic Osteokinematics:

- **Internal and External Rotation** in the Horizontal Plane
Kinematics of the Hip Joint
Pelvic-on-Femoral Osteokinetemics:

1. **Flexion and Extension in Sagittal Plane**
Kinematics of the Hip Joint

Pelvic-on-Femoral Osteokinematics:

- Lumbopelvic Rhythm
Kinematics of the Hip Joint
Pelvic-on-Femoral Osteokinematics:

- **Abduction** and **Adduction** in the **Frontal Plane**
- **Right lateral tilt** and **left lateral tilt**
Kinematics of the Hip Joint
Pelvic-on-Femoral Osteokinematics:

- Internal and External Rotation in the Horizontal Plane
- Right rotation and left rotation
The Hip and Pelvic Girdle

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Muscular Considerations: Sagittal Plane Pelvic Motion

1. Pelvic-on-Femoral Flexion: Anterior Pelvic Tilt

- Force couple
  - Hip flexors
  - Lower trunk extensors
Muscular Considerations: Sagittal Plane Pelvic Motion

1. Pelvic-on-Femoral Flexion: Posterior Pelvic Tilt

- Force couple
  - Hip extensors
  - Lower trunk flexors
Muscular Considerations: Overall Function of the Hip Flexors

2. Femoral-on-Pelvic Hip Flexion

- synergy between hip flexors and abdominal muscles
Muscular Considerations: Extensors

Pelvic-on-Femoral
Hip Extension
Muscular Considerations: Hip Adductors

- Hip Adduction
- Pelvic Action?
- Muscles being utilized?
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Specific Functional Considerations

- Bilateral hip motion in sagittal plane
- Unilateral hip motion if sagittal plane
- Single-leg stance
  - Walking
  - Running
  - Untrained