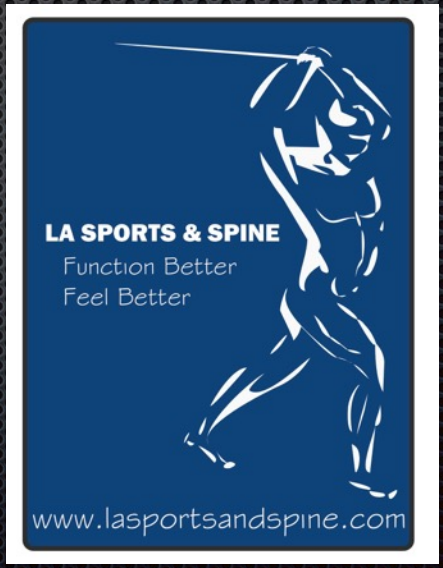
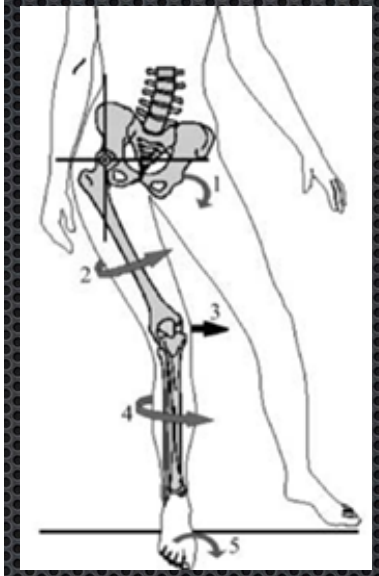
IV) Frontal Plane Stability

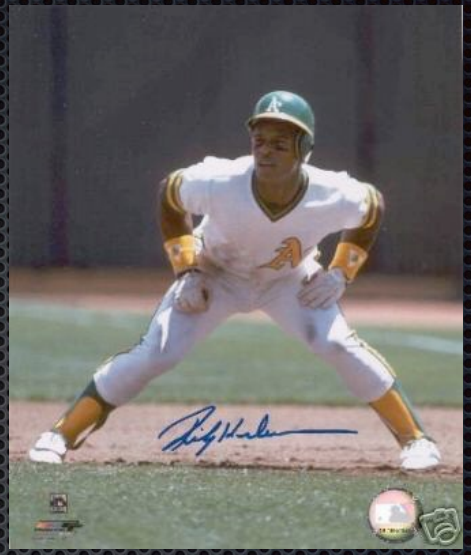
Note: Include multi-planar challenges



Core Stability in the Frontal Plane - P822-823

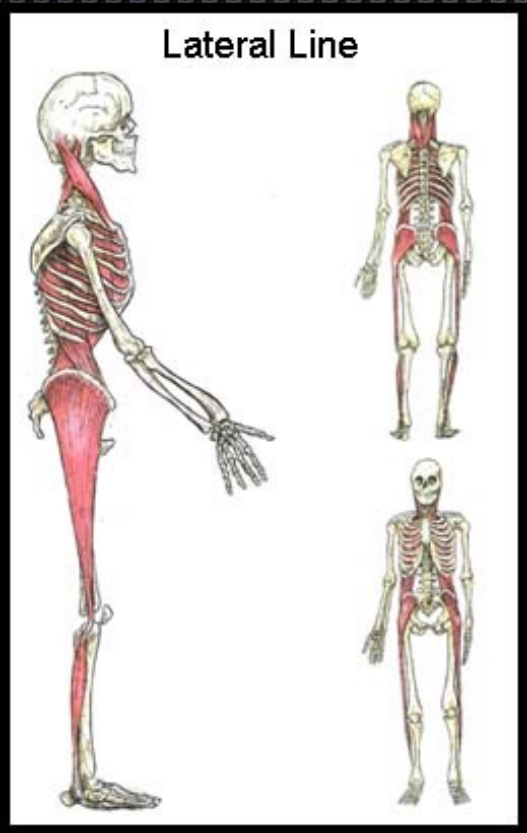


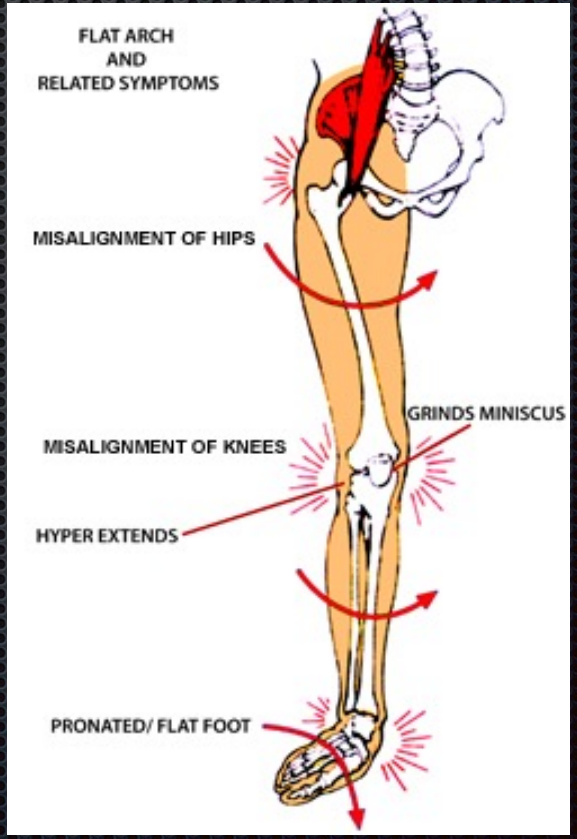
Lateral Stability




MIAMI
3

Lower Quarter Kinetic Chain





Squat strength predicted knee valgus in women during landing

ARTICLE ALERT

Relationship Between Selected Measures of Strength and Hip and Knee Excursion During Unilateral and Bilateral Landings in Women

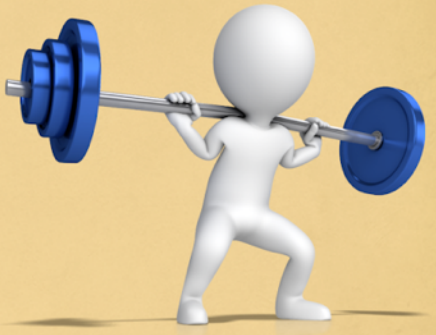
Written by McCurdy et al., J Strength Cond Research, Sept 2, 2014

Designed by ©YLMSportScience

The purpose of this study was to compare the relationship between several measures of single-joint, isometric, eccentric, and squat strength and unilateral and bilateral landing mechanics at the hip and knee in women.

METHODS

- 26 healthy female subjects with previous athletic experience participated in this study.
- Hip & knee mechanics were measured using the MotionMonitor capture system with 3-dimensional electromagnetic sensors during bilateral (60 cm) & nilateral drop jumps (30 cm).
- On a separate day, isometric hip extension, external rotation, and abduction strength were measured using a handheld dynamometer.
- Eccentric & isometric knee strength were measured on the Biodex IV Isokinetic Dynamometer.
- Free weight was used to measure the bilateral squat and a modified single-leg squat.



RESULTS

- The strongest correlations were found between squat strength & knee valgus ($-0.77 \leq r \leq -0.83$) & hip adduction ($-0.5 \leq r \leq -0.65$).
- After controlling for squat strength, hip external rotation strength and unilateral knee valgus (-0.41), hip abduction strength and bilateral knee valgus (-0.43), and knee flexion strength and bilateral hip adduction (-0.57) remained significant.
- Eccentric knee flexion strength and unilateral knee internal rotation was the only significant correlation for eccentric strength (-0.40).
- Squat strength seems to be the best predictor of knee valgus and was consistently related to hip adduction.
- Isometric & eccentric measures demonstrated few significant correlations with hip and knee excursion while demonstrating a low-to-moderate relationship.
- Hip & knee flexion and rotation do not seem to be related to strength.

A) Assessment

1.1 Leg Squat/Lateral Step Down

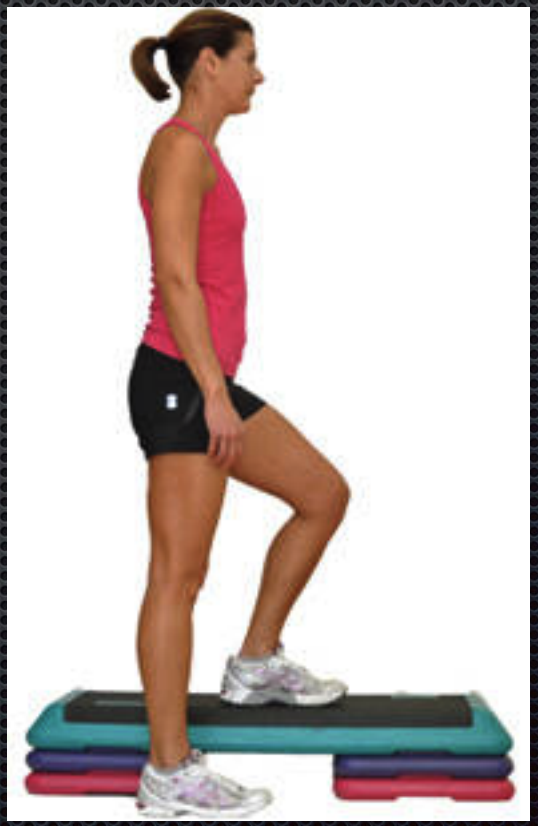
2.1 Leg Bridge

3.Bear

4.Hip Abduction

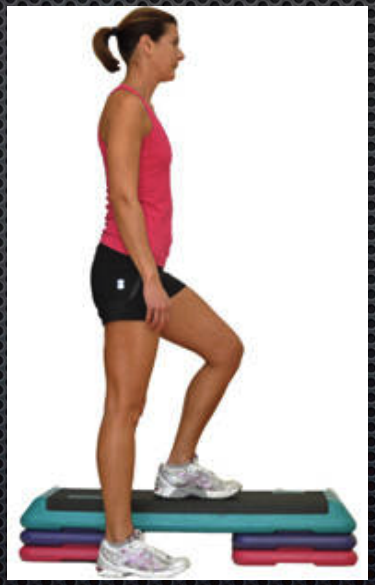
1. 1 leg squat/Lateral Step Down

- 8”
  he



1 Leg Squat

- Squat to approx 30 deg. Hip flexion
- Or, perform off stair step 8” or 20 cm height

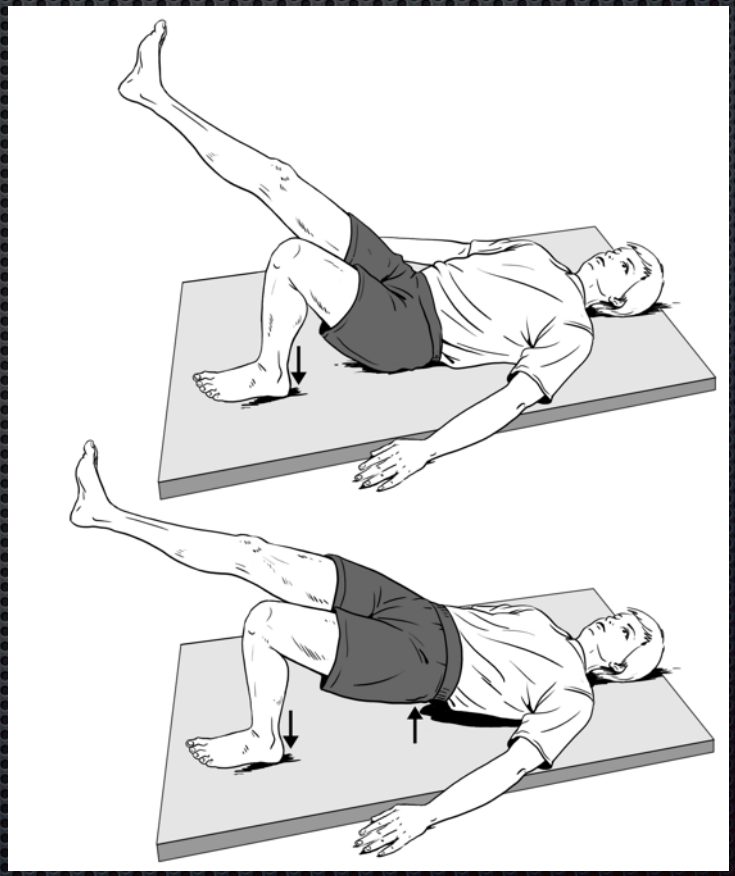


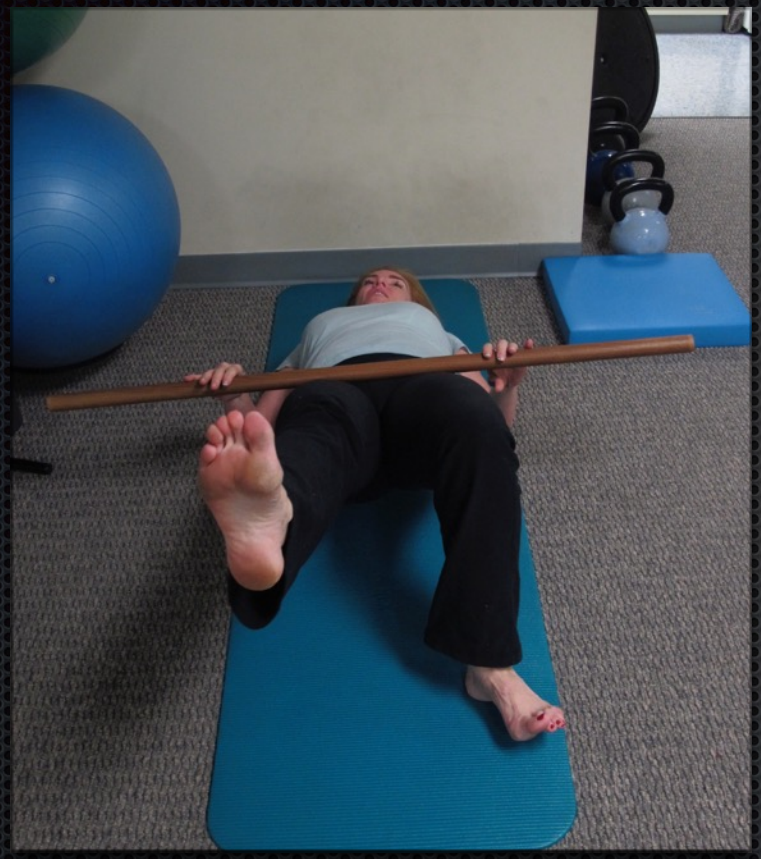
Scoring

- 0 - pain
- 1 - Can’t perform movement to approx 30 deg knee flexion
  - Knee valgosity (knee passes medial to foot)
- 2 - performs movement w/ compensation
  - L/S flexion
  - Ant patellar shear
  - Trendelenberg
  - Hyperpronation
- 3 - movement performed w/out compensation

2. 1 Leg Bridge – p631

- Bridge Up
- Alternate Kicks
- Perform 1 leg bridge up/ down





Scoring

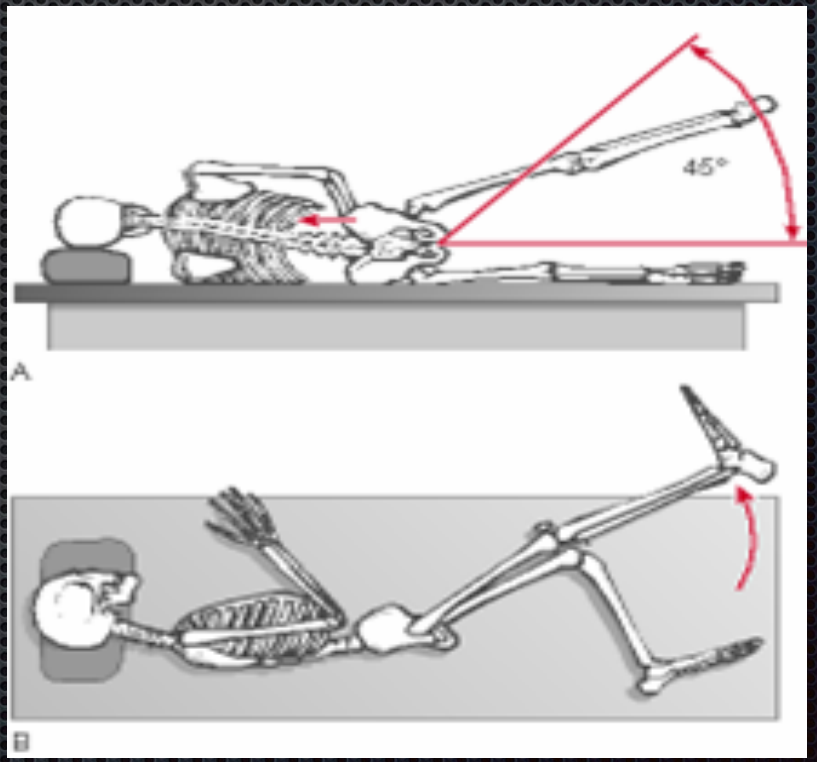
- 0 - Pain
- 1 - Can’t perform movement
  - Any pelvic twist or drop
- 2 - Performs movement w/ compensation
  - can’t raise hips to neutral position
  - thighs don’t stay parallel
- 3 - Movement performed w/out compensation

3. Bear

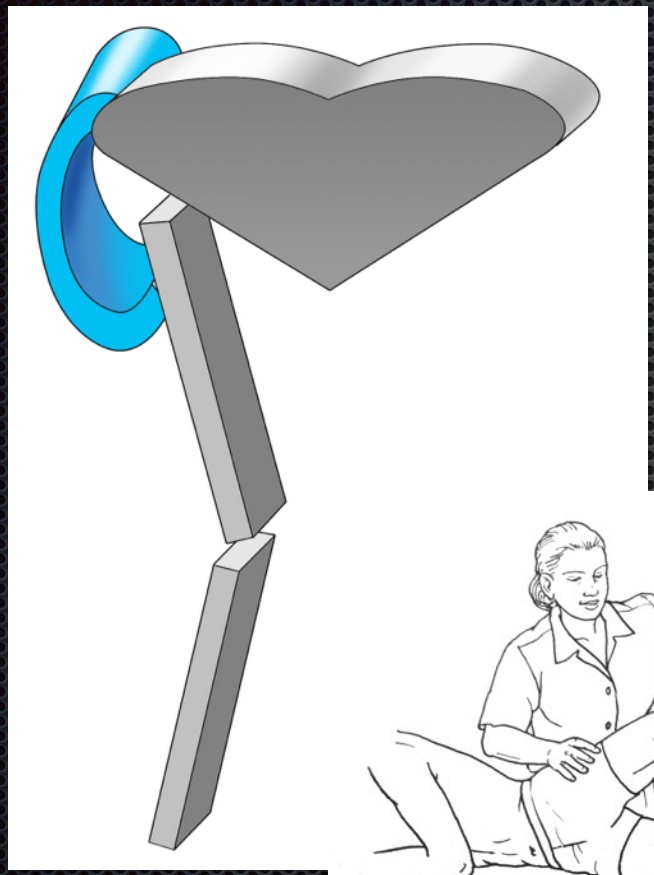
4. Hip abduction

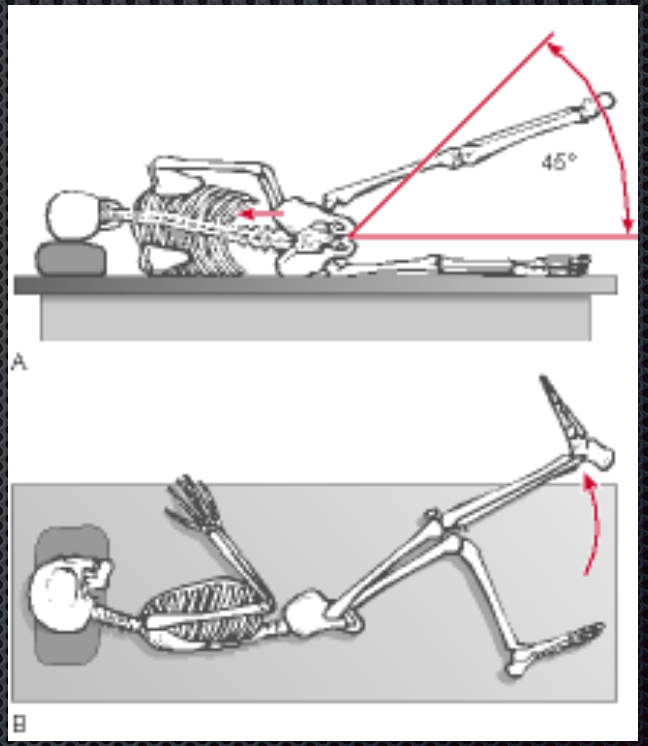
Dysfunction

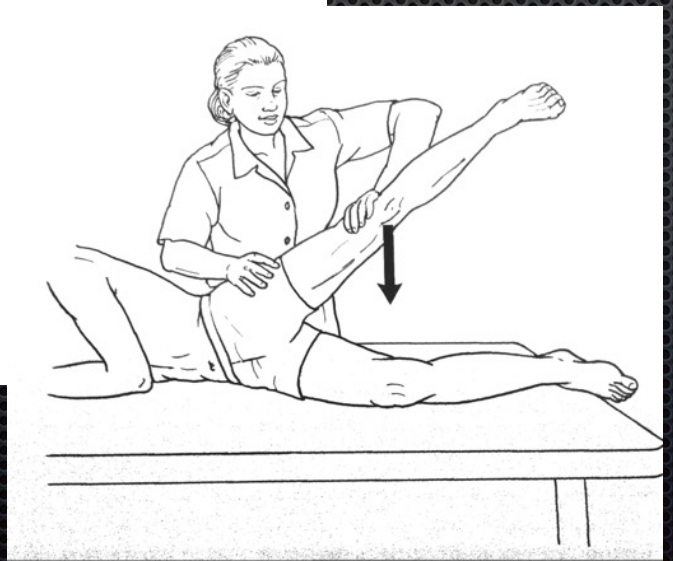
- *weak or feel low back*
- Hip hike - QL OA
- Hip flexion - TFL OA



Frontal Plane - Knee is slaved to hip







B) TRAINING

- Movement Prep
- Floor
- Lateral/Rotary Squat
- 1/2 Kneeling - Split Stance
- Carry/Lateral Walk/ Step-ups

a) Movement Prep

- ViPR
- Weight Shifts

Movement Prep

b) Floor Based

1. Developmental Get-up
2. Diagonal Sit/Bridge

1. Developmental - Get Up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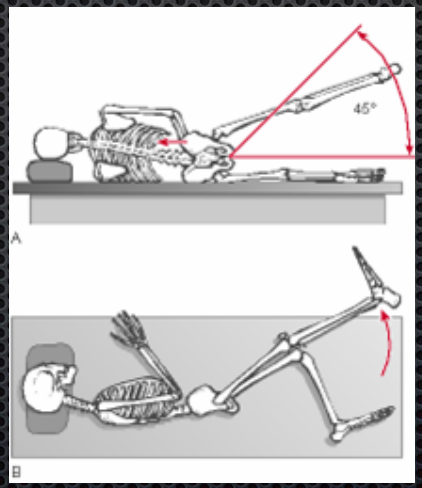

45°
A
B

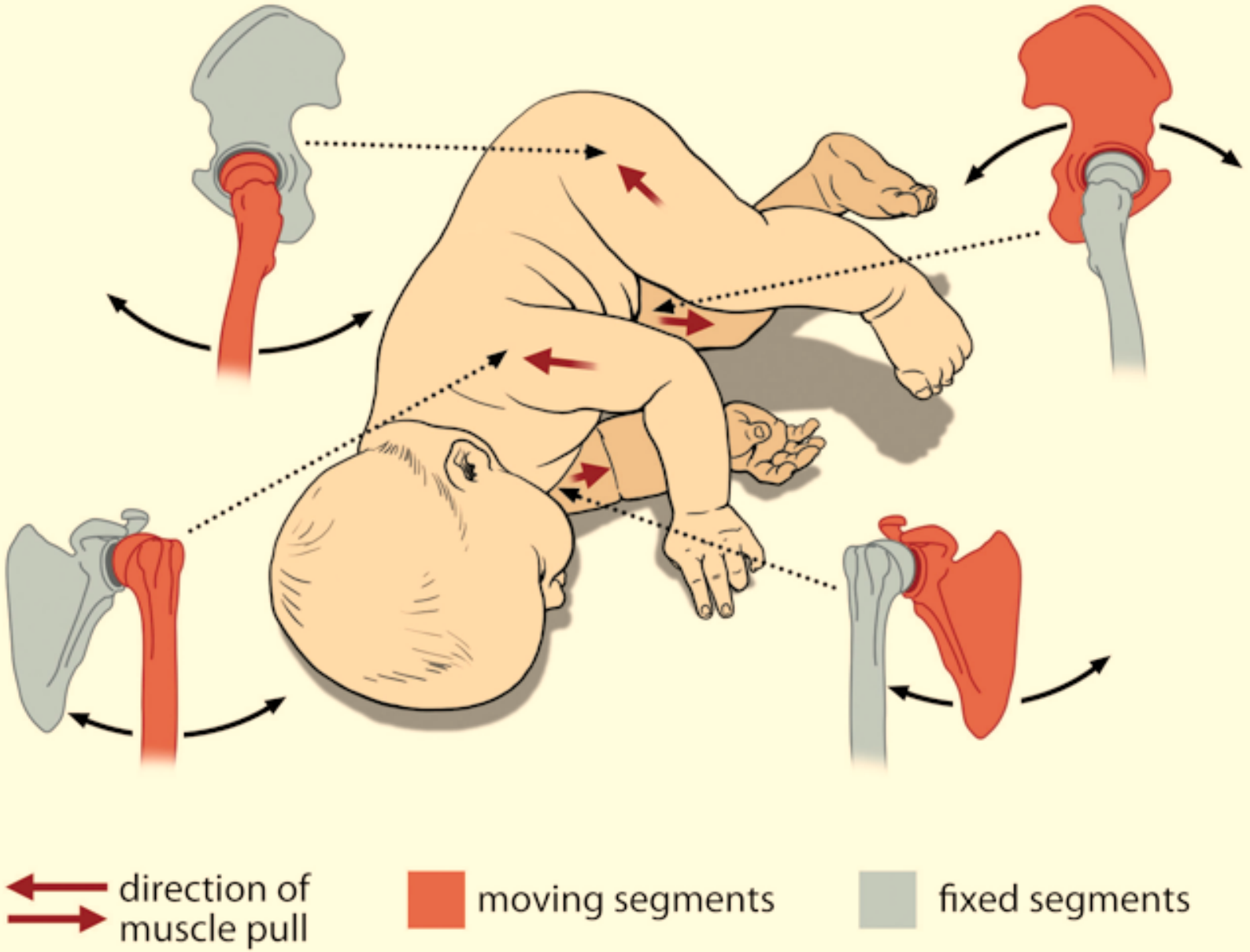
2. Diagonal Sit-Bridge (Vojta)


SOUL


SOUL

Diagonal Sit/Bridge w/ Pull


ucla
BRUINS
MADE HERE
PASSIONATE
STRONG
COMPETITIVE
ATHLETE


direction of muscle pull
moving segments
fixed segments

Skill Transfer to Split Stance (Running)

c) Lateral/Rotary Squats

1. Lateral Squat (manual or strap resistance)
2. Lateral Squat (sandbag)
3. Lateral Squat (Kettlebell)
4. Lateral Pull (sled)
5. Rotary Squat (from/to) (Pulley/Med ball)
6. Lateral Slides

One Arizona Man Has Produced More Medalists Than Most Countries

1. Lateral Squats - AP/Koichi Sato, A.T.C.

Lateral Squats - AP/Koichi Sato, A.T.C.

Load &
Explode

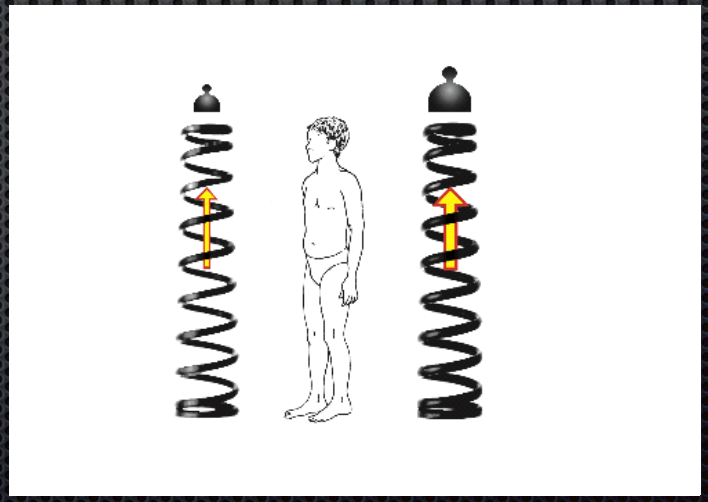

GO THE EXTRA MIL
BECOME LEGENDA
RISE ABOVE

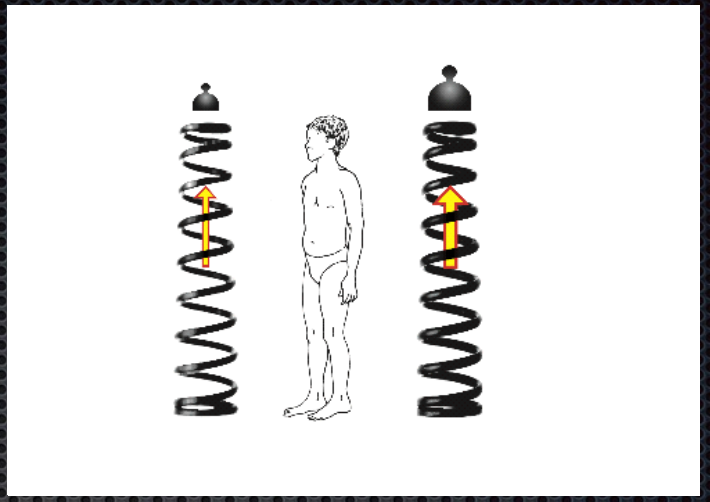
2. Lateral Squats - Sand Bag

3. Side Step with KB Swing

4. Lateral Sled Drag

5. Rotary Squat





6. Lateral Slides

d)1/2 Kneeling/Split Stance

1. Halo
2. Reverse Lunge Slider (w/ reactive band resistance)
3. Max Lunge - Reverse Lunge w/ Arc

Sagittal

Transverse

Frontal

1. Multi-Planar
Inline 1/2 Kneeling Halo

2. Reverse Lunge Slider - Reactive

Reverse Lunge with Arc (Sandbag)

Reverse Lunge with Arc (Sandbag)

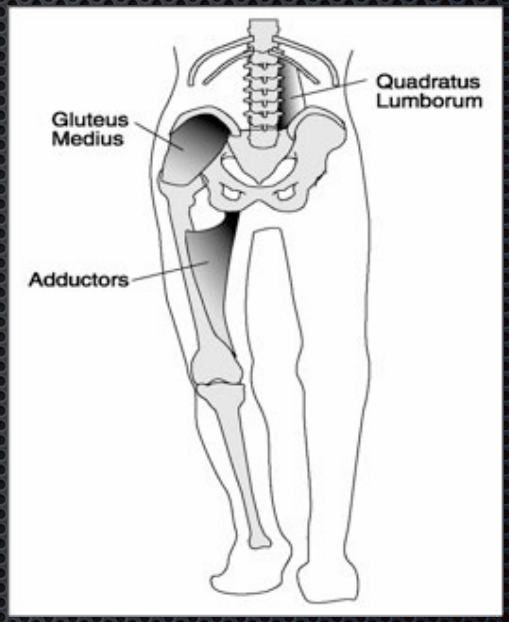
Reverse Lunge with Arc (Sandbag)

e) Carry/Lateral Walk/Step

1. Kettlebell Carry
2. Lateral Band Walk

1. Kettle Bell Carry

- **Goal:** Activate the core, specifically the obliques & flank muscles (quadratus lumborum)



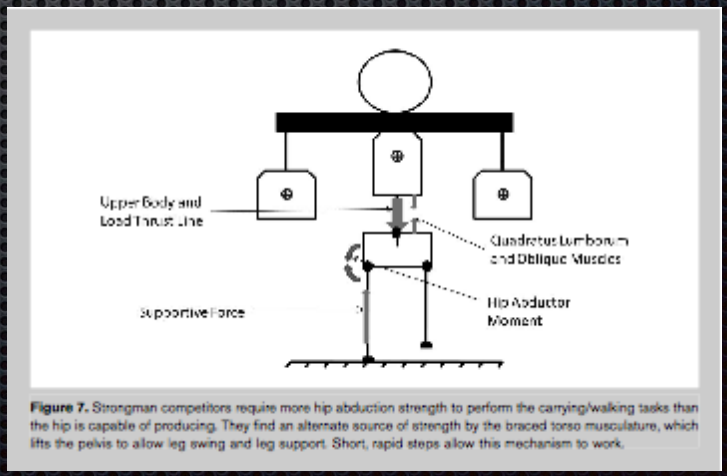
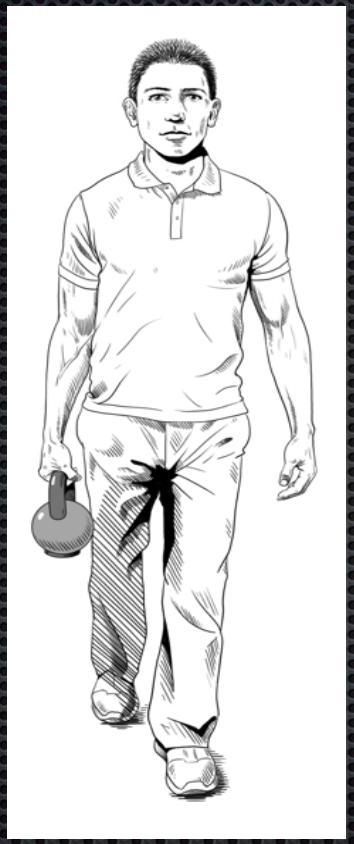


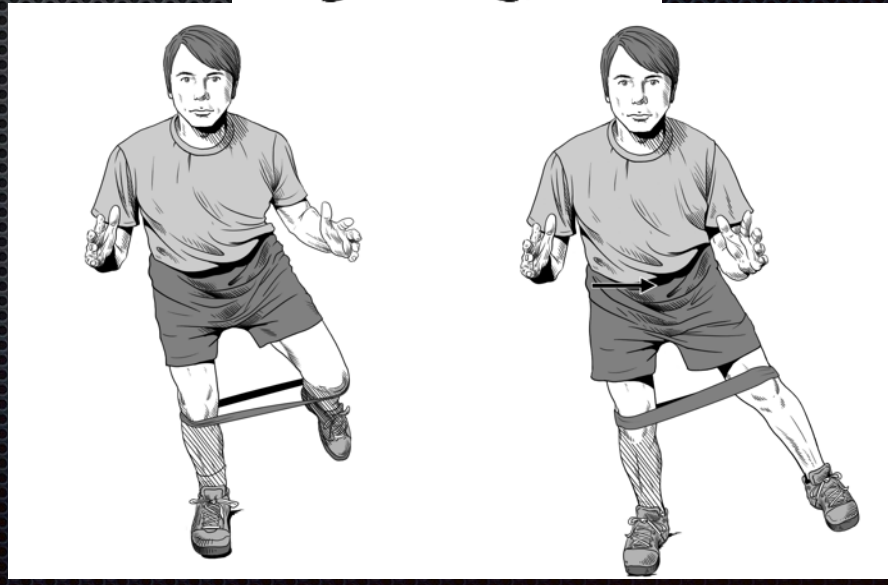
Figure 7. Strongman competitors require more hip abduction strength to perform the carrying/walking tasks than the hip is capable of producing. They find an alternate source of strength by the braced torso musculature, which lifts the pelvis to allow leg swing and leg support. Short, rapid steps allow this mechanism to work.

Suit Case Carry

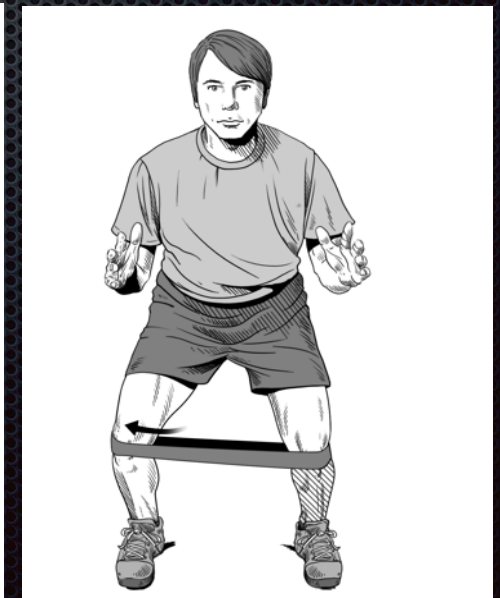
2. Lateral Band Walk

- Start in an athletic position with a band just above your knees
- Balance on one leg
- Step to the side and balance again on the same leg
- Repeat for 5-6 steps
- Reverse directions



Functional Clam Shell

- Place a band around your knees
- Stand in an athletic position
- Allow your knee to slowly move inwards slightly
- Then, perform a functional clam shell by turning your knee out against the resistance of the band



★ Start in an athletic posture
★ Balance on 1 leg
★ Step laterally & balance again on the same leg
★ Continue w/ lateral steps pausing to balance each time
★ You should feel the effort in the buttocks on the leg that is balancing & pushing