

#ideaworld



LIMITLESS

# Stability vs. Mobility

Which comes first???

PRESENTED BY

**Brian Richey B.S. MES**

Balanced Body Faculty

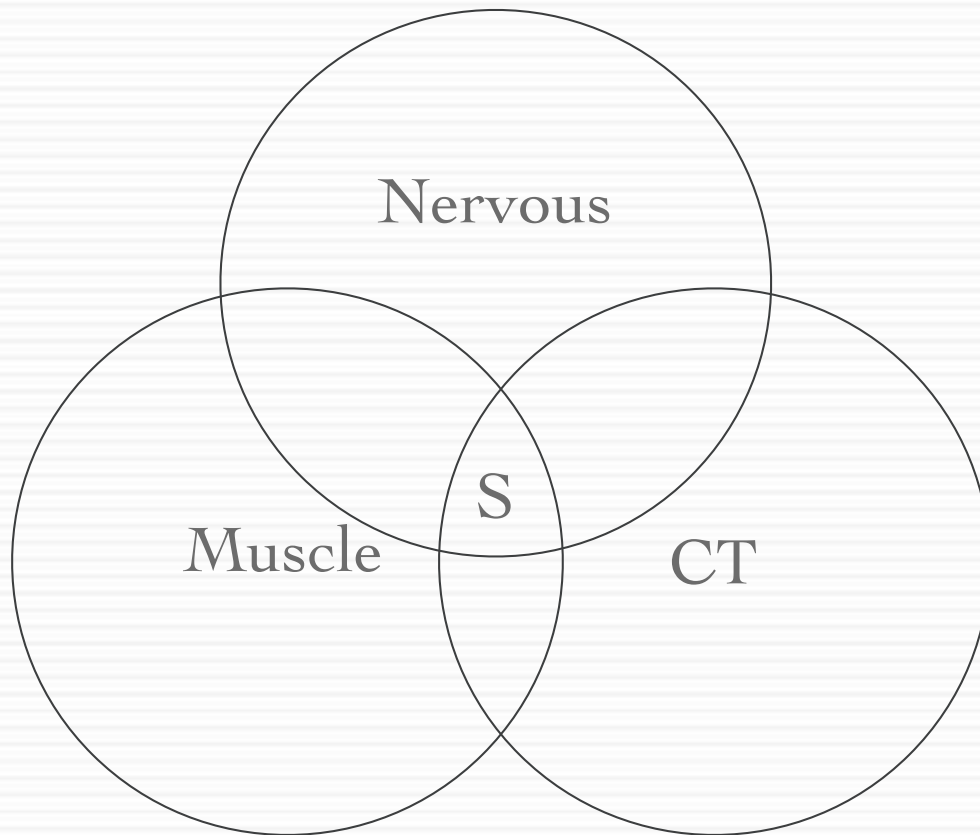
# Stability



- ◆ the quality or state of something that is not easily changed or likely to change
- ◆ the quality or state of something that is not easily moved
- ◆ the quality or state of someone who is emotionally or mentally healthy

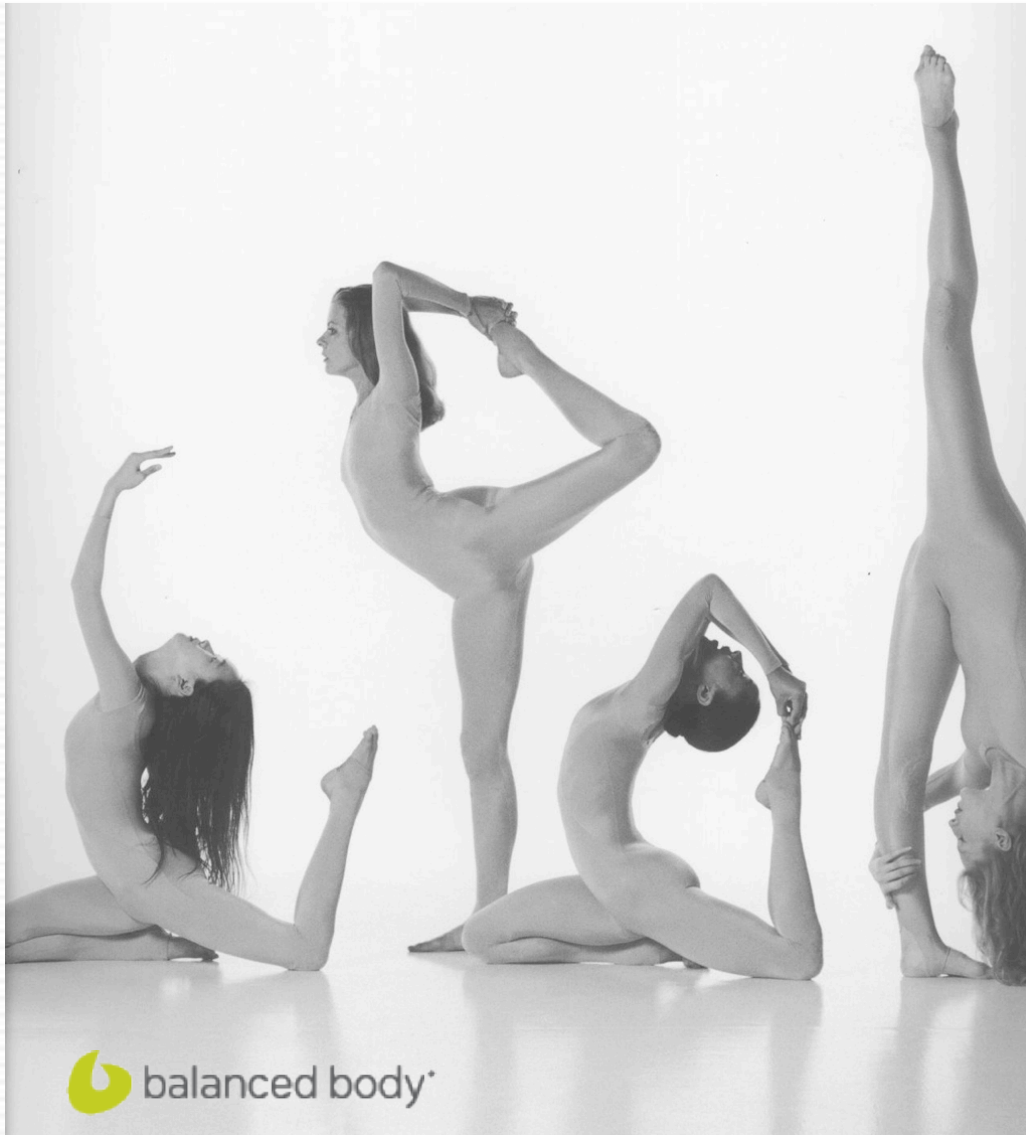
Definition courtesy of Merriam-Webster Dictionary

# Joint Stability



- ♦ **Joint stability** refers to the resistance offered by various musculoskeletal tissues that surround a skeletal **joint**.
- ♦ Several subsystems ensure the **stability** of a **joint**.
- ♦ These are the passive (Connective Tissue, ligaments, bones, joints), active (muscle tone) and neural subsystems (nervous system).

# Mobility



- ◆ Capable of moving or being moved
- ◆ The ability to move in one's environment with ease and without restriction.

# Joint Mobility



- ♦ the degree to which an articulation (where two bones meet) is allowed to move before being restricted by surrounding tissues (ligaments/tendons/muscles etc.)... otherwise known as the range of uninhibited movement around a joint.

# Too much Mobility



**Mobility > Stability = Hyper-mobility**

# Too much Stability



**Stability > Mobility = Rigidity**

# Joints: Stable or Mobile?

Mobility and stability  
of the kinetic chain

GLENOHUMERAL = MOBILITY

SCAPULOTHORACIC = STABILITY

THORACIC SPINE = MOBILITY

LUMBAR SPINE = STABILITY

HIP = MOBILITY

KNEE = STABILITY

ANKLE = MOBILITY

FOOT = STABILITY

- ◆ Which joints to focus on stability?
- ◆ Which joints to focus on mobile?



# Pain Patterns



- ♦ Pain in a joint can be caused by **either** a lack of stability or mobility.
- ♦ We need to look not only at the joint involved but the surrounding joints

# Pain Patterns (Stable Joint)



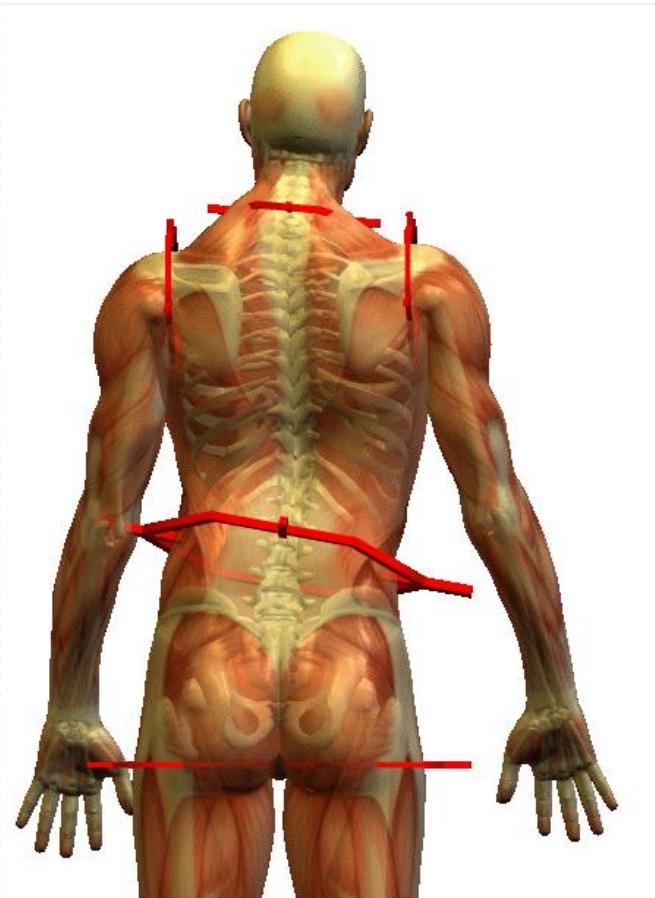
- ◆ If pain is in a stable joint, ask
  - ◆ Is there enough stability in this joint?
  - ◆ Is there a lack of mobility in the above or below joint?
- ◆ If it is in a mobile joint, ask
  - ◆ Is this joint too mobile?
  - ◆ Are my surrounding joints stable enough?

# Lack of Mobility Patterns



- ◆ Loss of mobility in the Ankle = Knee Pain
- ◆ Loss of mobility in the Hip=LBP, Knee Pain
- ◆ Loss of mobility in the Thoracic Spine=Cervical, Shoulder or LBP

# Do We Need to Assess?



- ◆ Assessment is vital, if you don't know what and why you are doing release work you are wasting the clients time and money.
- ◆ Assessments can be done as part of your general assessment
- ◆ Can also be done during each session
- ◆ **Watch them move!!!**

# Assessments-Stability

## Assessments:

- ♦ Trendelenburg Test
  - ♦ Gluteus Medius Weakness
- ♦ Squat Test
  - ♦ Femoral Rotation
- ♦ Quad 1 Arm Raise
  - ♦ Scapular stability
  - ♦ Collapse? Even?
- ♦ Forward Lean Test
  - ♦ Multifidi

# Trendelenburg Test



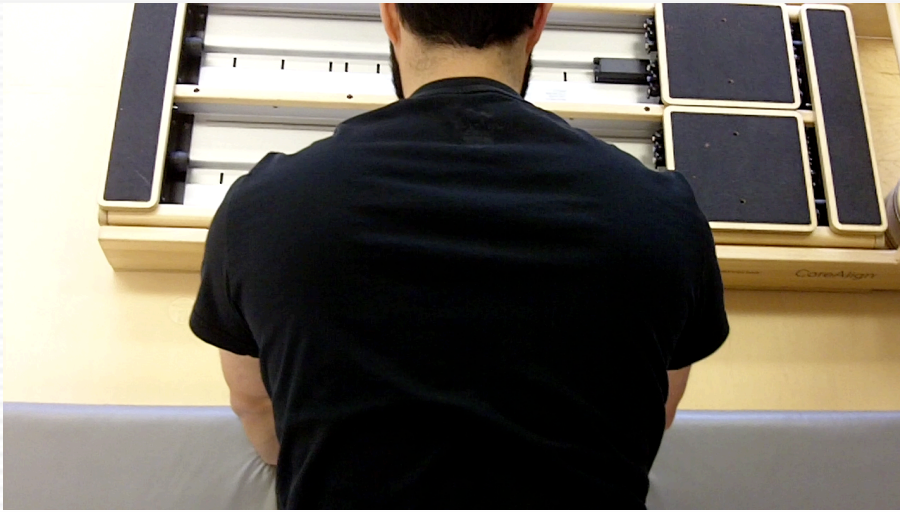
- ◆ Stand on 1 foot (may need balance assist)
- ◆ Note:
  - ◆ Difference between sides
  - ◆ Leaning toward standing leg
  - ◆ Slinging out or rotation of hips
    - ◆ Weak glute med
  - ◆ Hiking of hips
    - ◆ Overactive/Tight QL

# Squat Test



- ◆ Perform a squat 3 x
- ◆ Note:
  - ◆ Difference between sides
  - ◆ Does one patella point inward=internally rotated femur
  - ◆ Weak Glute Med/Tight Adductors
  - ◆ Balance between each side
  - ◆ Heels coming up
  - ◆ Tight/Overactive Calves

# Quad/Hover 1 Arm Raise



- ◆ In quadruped, with good scapular stability, lift one arm
- ◆ Inferior angle needs to be spread wide
- ◆ Trap 1 need to be relaxed



# Forward Lean (Multifudi)



- ◆ With fingers in the groove between the erectors and spinous processes, feel your multifidi.
- ◆ As you lean forward, do they fire evenly? Same force?
- ◆ If not, the one that is firing late, place that leg behind the other and repeat. Keep adjusting leg position until they are even or the lagging one is now in firing first.
- ◆ 10 reps, then bring feet slightly closer together and repeat keeping them firing as close together as possible,
- ◆ Repeat until feet are together

# Assessments-Mobility

## Assessments:

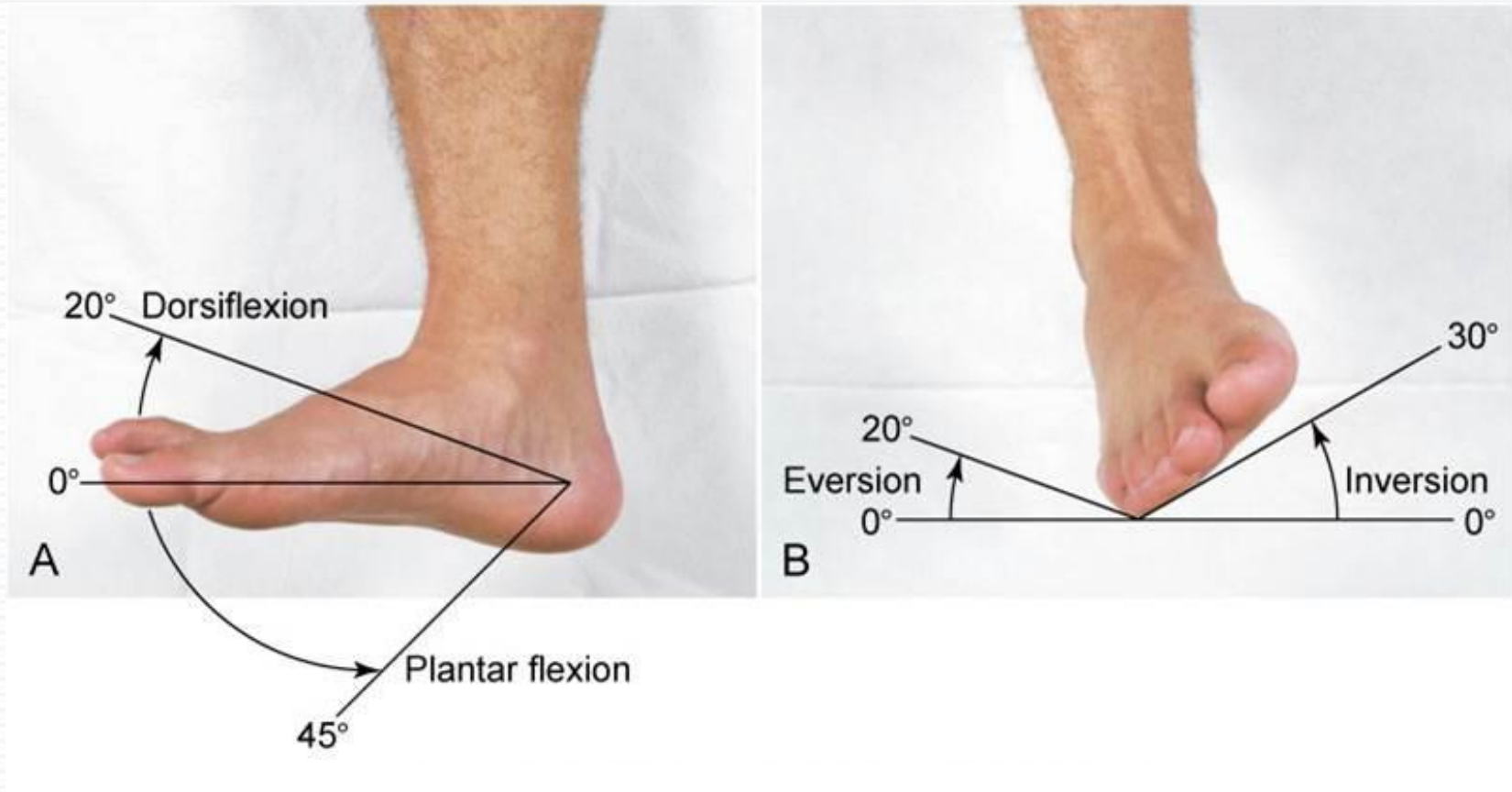
- ♦ Thomas Test
- ♦ IT Band, Hip Flexor, Quadriceps
- ♦ Painful Arch
- ♦ Rotator cuff impingement
- ♦ Ankle ROM
- ♦ Cervical ROM
- ♦ Appley Test
- ♦ Rotator Cuff
- ♦ Telescoping Arms
- ♦ Thoracic Rotation
- ♦ Compare Sides

# Thomas Test

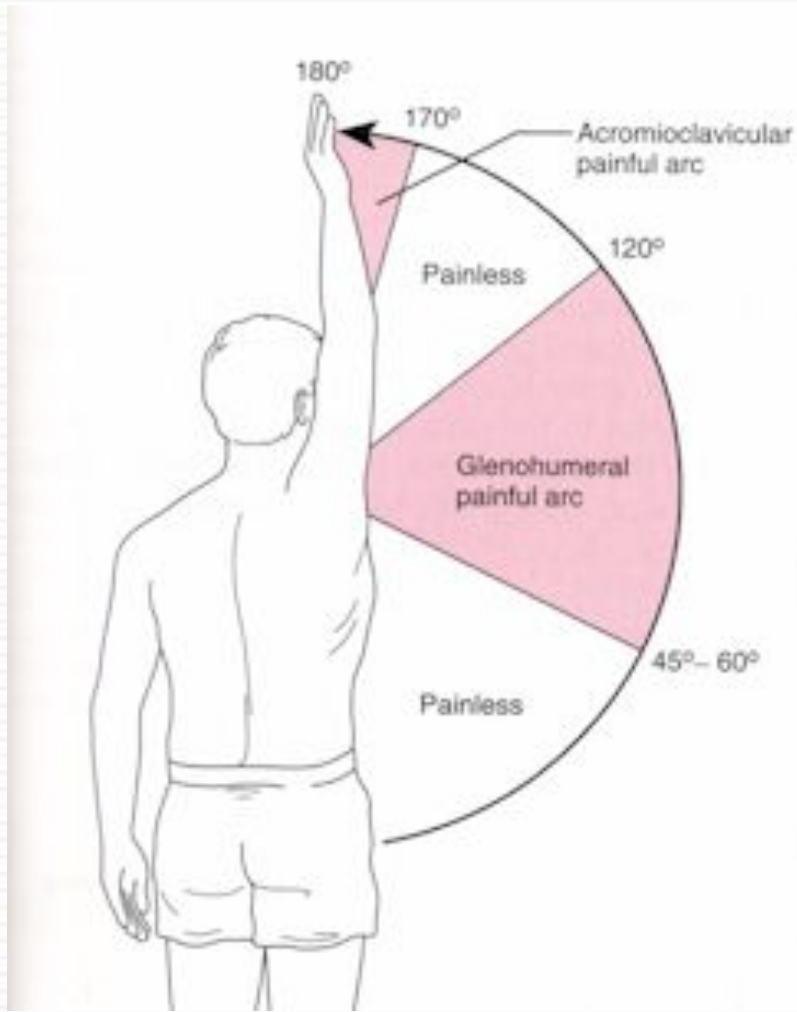


- ◆ Watch for:
  - ◆ Hip above the table= Tight Hip Flexors
  - ◆ Femur Ext. Rotation= Tight IT Band
  - ◆ Knee bend  $>90^\circ$ = Tight Quads

# Ankle ROM



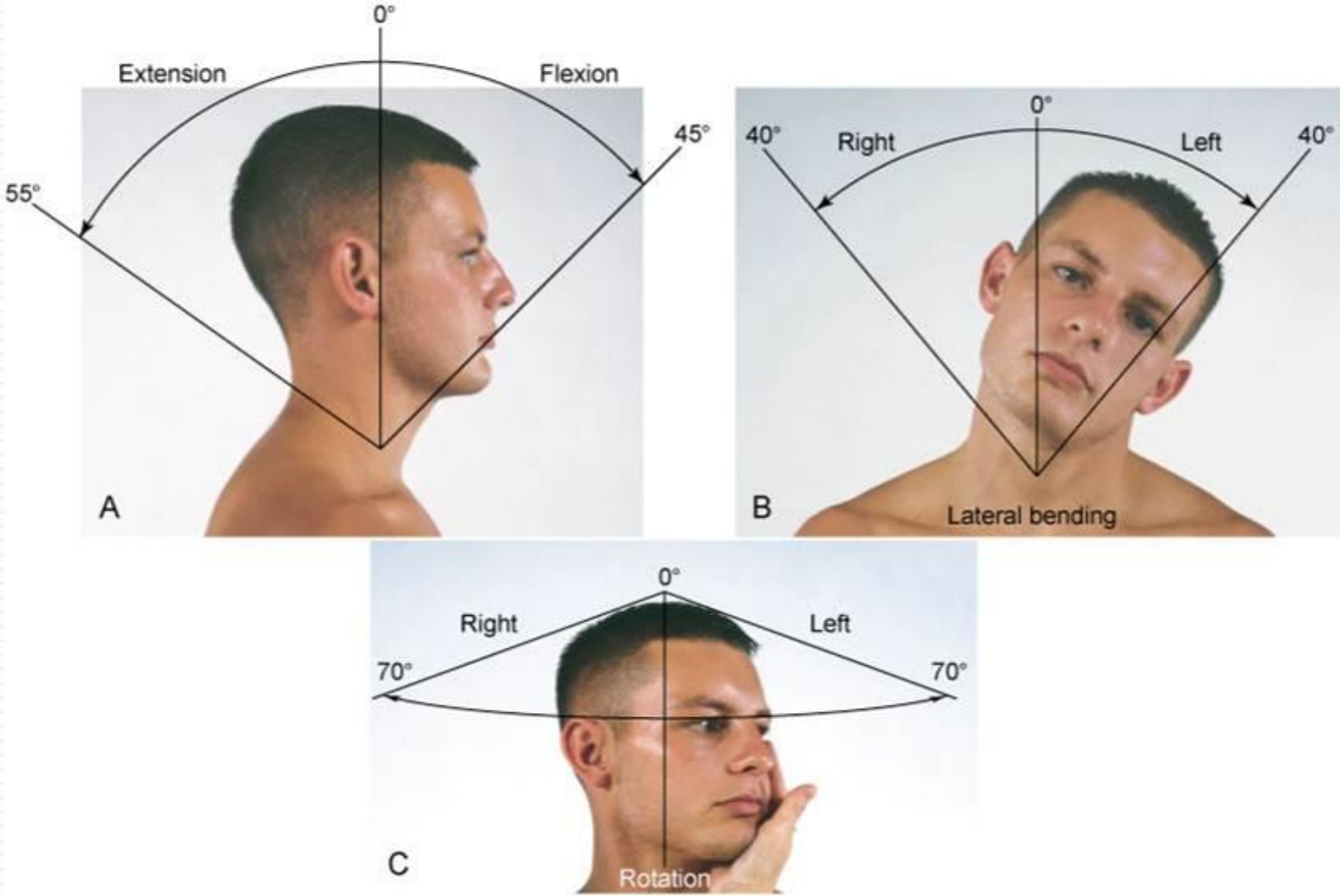
# Painful Arch



## ◆ Painful Arch:

- ◆ Pain between 60°-120° = Rotator Cuff Impingement
- ◆ Pain above 170° = AC Joint impingement

# Cervical ROM



# Appley's Test (Scratch)



- ◆ One arm overhead, elbow flexed & opposite arm behind back, try to touch.
- ◆ Difference between sides
- ◆ Demonstrates Rotator cuff weakness
- ◆ **Upper arm**=Ext Rot Strength, Int Rot Flex  
**Lower arm**=Int Rot Strength, Ext Rot Flex

# Telescope Arms



- ◆ Side lying, top leg on Foam Roll, arms extended, top arm slightly beyond lower, head supported.
- ◆ Slowly trace your top arm along bottom arm and chest while rotating your thorax so your head and chest are facing up.



# Muscle Anatomy



- ◆ There are 2 categories of muscle in terms of functional movement:<sup>(1)</sup>
  - ◆ Mobilizing
  - ◆ Stabilizing
- ◆ When talking about imbalance or dysfunction, both need to be addressed.

# Mobilizing Muscles

- ◆ Superficial
- ◆ Fast Twitch
- ◆ Often Bi-Articular
- ◆ Source of Torque
- ◆ Build Tension Rapidly
- ◆ Fatigue Quickly
- ◆ Better Activated at High Levels of Resistance
- ◆ More Effective in Open Chain Movements
- ◆ In Muscle Imbalance, Tends to Tighten and Shorten

# Stabilizing Muscles

## Primary

- ◆ Deep, Close to the Joint
- ◆ Slow Twitch
- ◆ Usually Mono-articular
- ◆ No Significant Torque
- ◆ Short Fibers

## Secondary

- ◆ Intermediate Depth
- ◆ Slow/Intermediate Twitch
- ◆ Usually Mono-articular
- ◆ Often a Source of Torque
- ◆ Attachments are Multipennate

# Muscle Rolls

- ◆ Some Muscles are both a mobilizer and a stabilizer, depending on the joint you are looking at.
- ◆ Example, the glutes can be a mobilizer of the hip or a stabilizer of the SI Jt./lumbar spine.
- ◆ First decide which joint has PN/dysfunction/imbalance. Then figure out which muscles are stabilizers and mobilizers
- ◆ Some Joints (Hinge) may not have a stabilizing muscle attached to the joint. This joint is relatively stable through its structure.



# Stabilizing Muscles



- ◆ Builds Tension Slowly
- ◆ More Fatigue Resistant
- ◆ Better Activated at Low Levels of Resistance
- ◆ More Effective in Closed Chain Movement
- ◆ In Muscular imbalance tends to Weaken and Lengthen

# Stabilizing Exercises

- » Forward Lean
- » Pregnant Cat
- » Hip Ext Holds
- » Quad 1 Arm Lift
- » Seated Statue
- » FR Shoulder Flexion
- » FR Shoulder Abduction
- » FR Ext Rotation
- » 1 Foot Balance w/ Band Arm abduct
- » Togu Ball Cervical Routine
  - » Retraction
  - » Rotation
  - » Nods

# Forward Lean (Multifudi)



- ◆ With fingers in the groove between the erectors and spinous processes, feel your multifidi.
- ◆ As you lean forward, do they fire evenly? Same force?
- ◆ If not, the one that is firing late, place that leg behind the other and repeat. Keep adjusting leg position until they are even or the lagging one is now in firing first.
- ◆ 10 reps, then bring feet slightly closer together and repeat keeping them firing as close together as possible,
- ◆ Repeat until feet are together

# Pregnant Cat (TVA)



- ◆ Quadruped, Neutral spine. Pull belly off the floor and hold. Release and repeat.
- ◆ Add perturbation to the body.



# Hip Extension Holds (Lumbar)



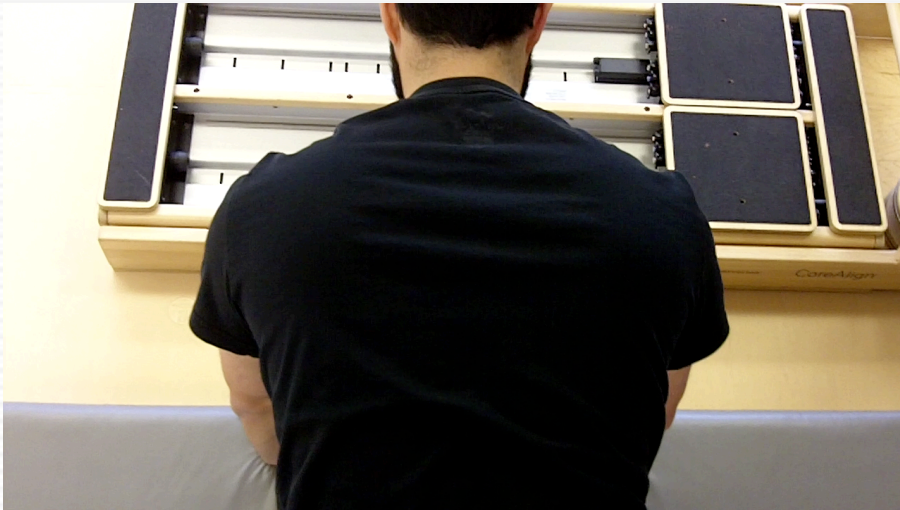
- ◆ Lying over a ball, neutral spine, squeezing the glute, extend hip and hold for 10 sec.
- ◆ Repeat 5-10x on each side. 2 Sets.

# Seated Statue (Multifudi)



- ◆ Seated on a chair or ball, arms crossed at the chest. Stand behind client.
- ◆ Apply light pressure at different angles to clients shoulders.
- ◆ Flexion, Extension, Lateral Flexion, Rotation.
- ◆ Focus on speed rather than intensity.

# Quad/Hover 1 Arm Raise (Scapula)



- ◆ In quadruped, with good scapular stability, lift one arm
- ◆ Inferior angle needs to be spread wide
- ◆ Trap 1 need to be relaxed

# Foam Roller Shoulder Flexion (Scapula)



- ◆ Hands begin shoulder width apart, then abduct arms pulling band slightly apart
- ◆ Keeping the ribs down take hands overhead.
- ◆ If client has pain, stop at a point before the point of pain

# Foam Roll Shoulder Abduction (Scapula)



- ◆ Hands begin shoulder width apart, then abduct one arm, pulling band apart. Alternate sides

# Foam Roll Ext. Rotation (Scapula)



- ◆ Lying on the foam roll; keeping your elbows at your sides;
- ◆ Externally rotate your arms.

# 1 Foot Balance/ 1 Arm Abduct (Knee)



- ◆ Standing on 1 inside foot, outside arm horizontally abducts.
- ◆ They first have to demonstrate they can single leg stand well.

# Togu Cervical Work (Cervical)



Stability



Mobility



Mobility

- ◆ Throughout each, gentle retraction into the ball



# Mobilizing Exercises

## » Ankle

- » Slant Board w/movement
- » Squatted Knee Rotations

## » Hip

- » Pelvic Rocking
- » Frog Divers

## » Lumbar

- » Togu Pelvic Circles
- » Togu Pelvic Tilts

## » Thoracic

- » Chicken Wing
- » Telescoping Arms

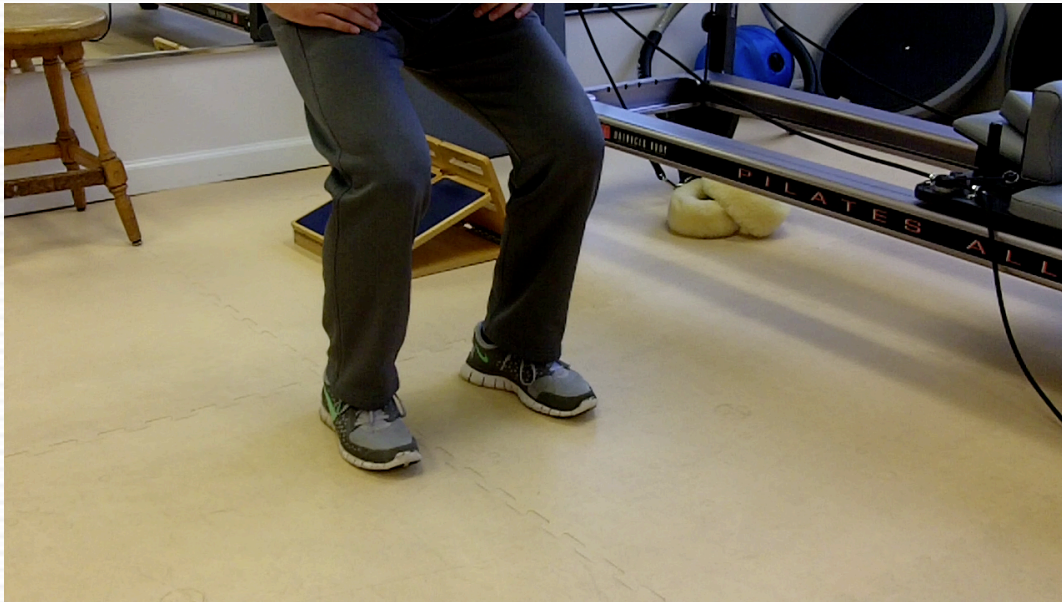
# Ankle Mob.-Slant Board



- ◆ Standing on a slant board until stretch is felt
- ◆ Move body, allowing for slight rotation and lateral flexion in ankle



# Squatted Ankle Mobilization



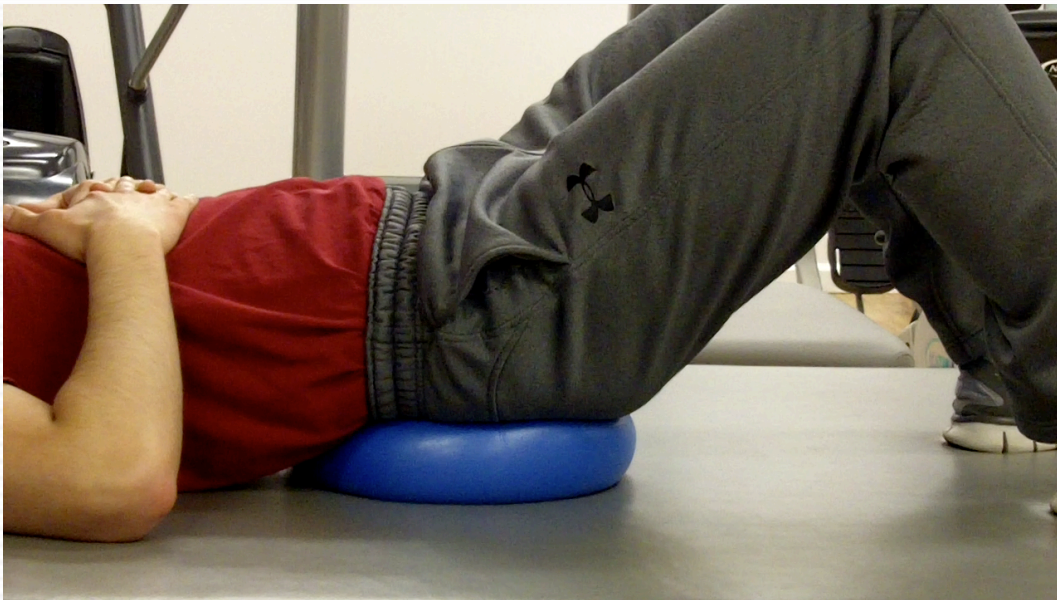
- ◆ In a squatted position, rotate from the knees while keeping the ankles still

# Pelvic Rocking



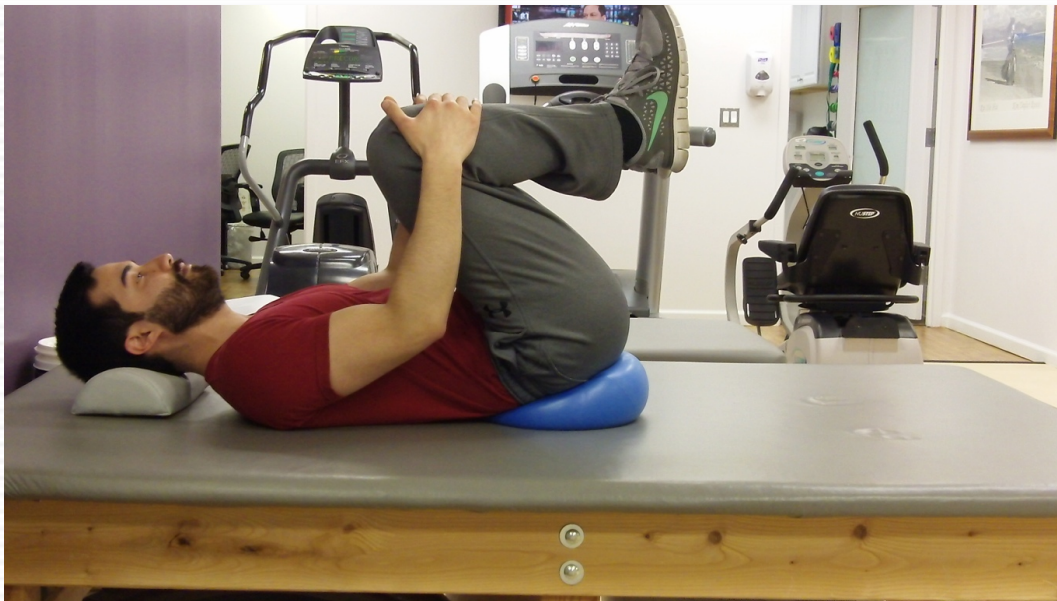
- ◆ In quadruped, one knee and hand slightly in front of the other
- ◆ In a straight line rock forward and back

# Togu Pelvic Clocks



- ◆ With the Togu ball under your pelvis, imagine your pelvis is a clock. You have a marble at the center of the clock.
- ◆ Tip the clock so the marble rolls to 6 o'clock then back to center.
- ◆ You can also perform 3 and 9 o'clock.

# Togu Lumbar Stretch



- ◆ With the Togu ball under your pelvis, pull your knees into your chest.

# Quad “Chicken Wing”



- ◆ Quadruped, one hand behind head reaching elbow through. Keep Spine long and neutral.
- ◆ Rotate elbow up toward the sky, head and chest follow.

# Telescope Arms



- ◆ Side lying, top leg on Foam Roll, arms extended, top arm slightly beyond lower, head supported.
- ◆ Slowly trace your top arm along bottom arm and chest while rotating your thorax so your head and chest are facing up.



# Any Questions?

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# References

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- » Koppenhaver SL, Fritz JM, Hebert JJ, Kawchuk GN, Childs JD, Parent EC, Gill NW, Teyhen DS. Association between changes in abdominal and lumbar multifidus muscle thickness and clinical improvement after spinal manipulation. J Orthop Sports Phys Ther 2011; 41(6): 389-99

# Thank you for coming

May you and your clients find benefit in this information.

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If you have any comments or questions, please contact Brian Richey at

[brian@fit4lifedc.com](mailto:brian@fit4lifedc.com)

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