

2019 Encore-Uhler Sports Medicine Symposium

Treating Patella-Femoral OA Pain with a Simplified Approach

Terry Trundle ATC, LAT, PTA

Orange Beach, Alabama

What Questions Should We Be Asking?

- How do you define patella-femoral syndrome (PFPS)?
- Can you isolate VMO strengthening?
- Performing straight leg raises should be reconsidered.
- What is the difference between short-arc quads, and terminal extension?
- Does hip strengthening really have a role in the treatment of patella-femoral pain?
- Is there a simplified approach anterior knee pain?

Reference: Bolgia LA, Earl-Boehm J et al. Int J Sports Phys Ther 2016

Rehabilitation Exercises – What to consider

- ROM of contact – compression
- Applied Pressure to articular surfaces
- Muscle activation patterns
- Open and closed kinetic chain compression

Historical Reference: T. Malone – 2010

Reference: Manske Re, Davies GJ Int J Sports Phys Ther 2016

Four Approaches to Treatment

- Instability
- Tension
- Friction
- Compression

*Reference: Terry Malone PT, EdD, ATC,
FAPTA. Professor – University of Kentucky*

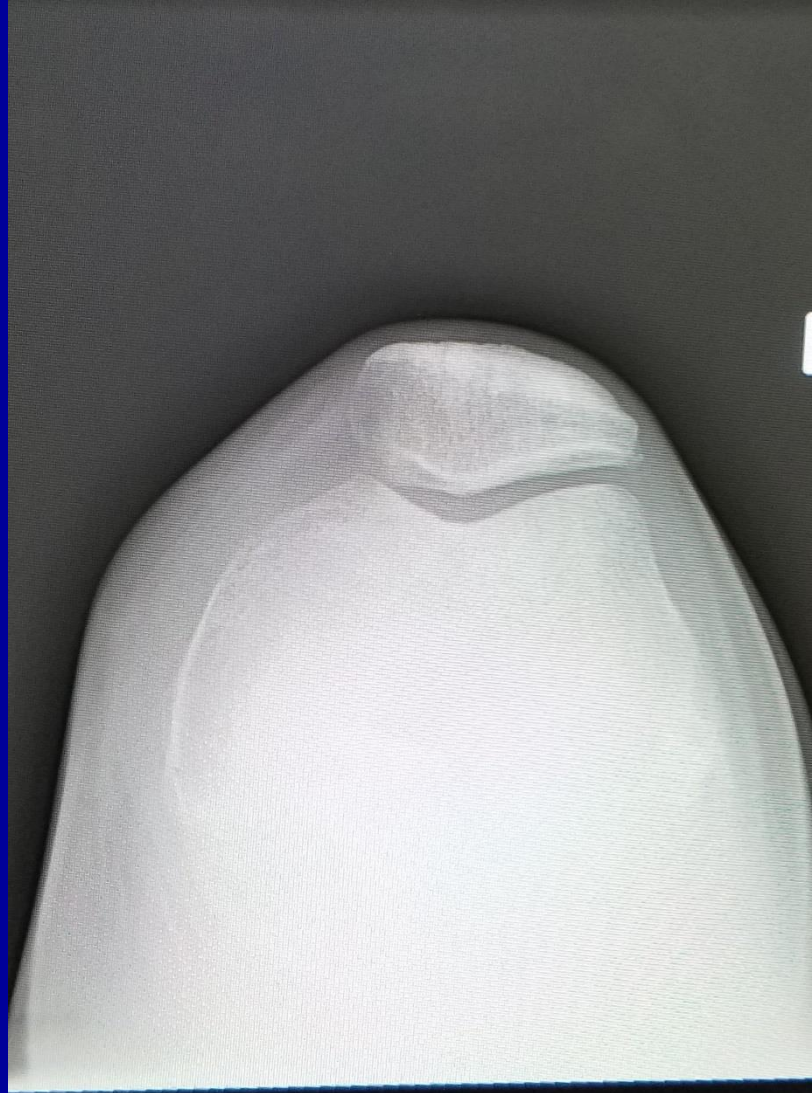
Instability

- Patella Instability
- Ligamentous Instability
- Subluxation
- Dislocation
- Treatment: Patella Control

Recommendations of Therapeutic Intervention

- Avoid terminal extension
- Exercise in the groove (patella within the sulcus) OKC
 - SAF-Quads – strengthening the quadriceps
- Get the patella medial
 - Taping, brace and manual mobility
- Core exercises: gluteals, abductors, adductors and hamstrings- eccentric mode
- Co-activation/hamstrings over the quadriceps
- CKC loading without pain

Reference: Ho KY, Epstein R et al. JOSPT 2017



R



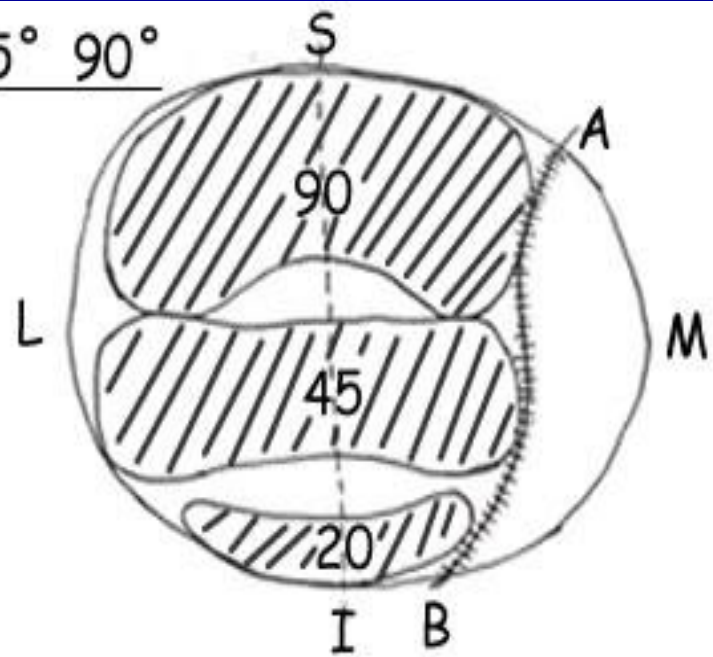




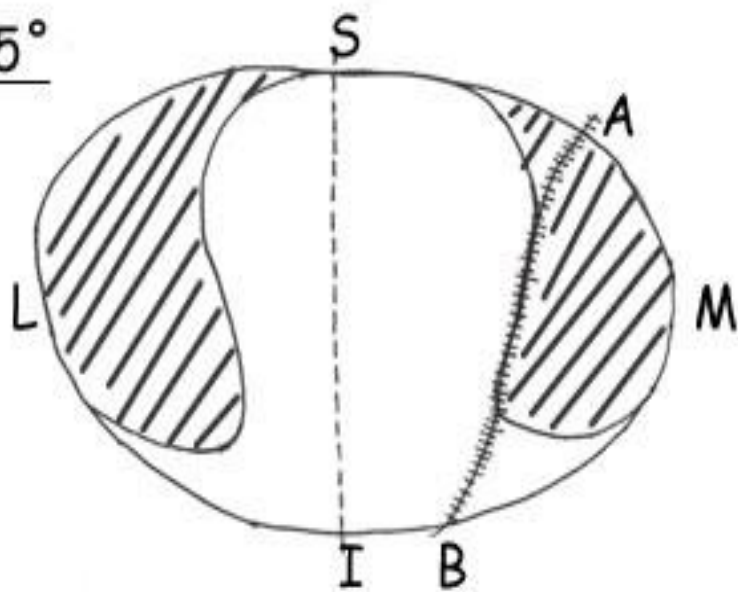
Reference: Sheehan FT 2010



20° 45° 90°



135°



VMO:VL EMG Ratio Arc Of Motion

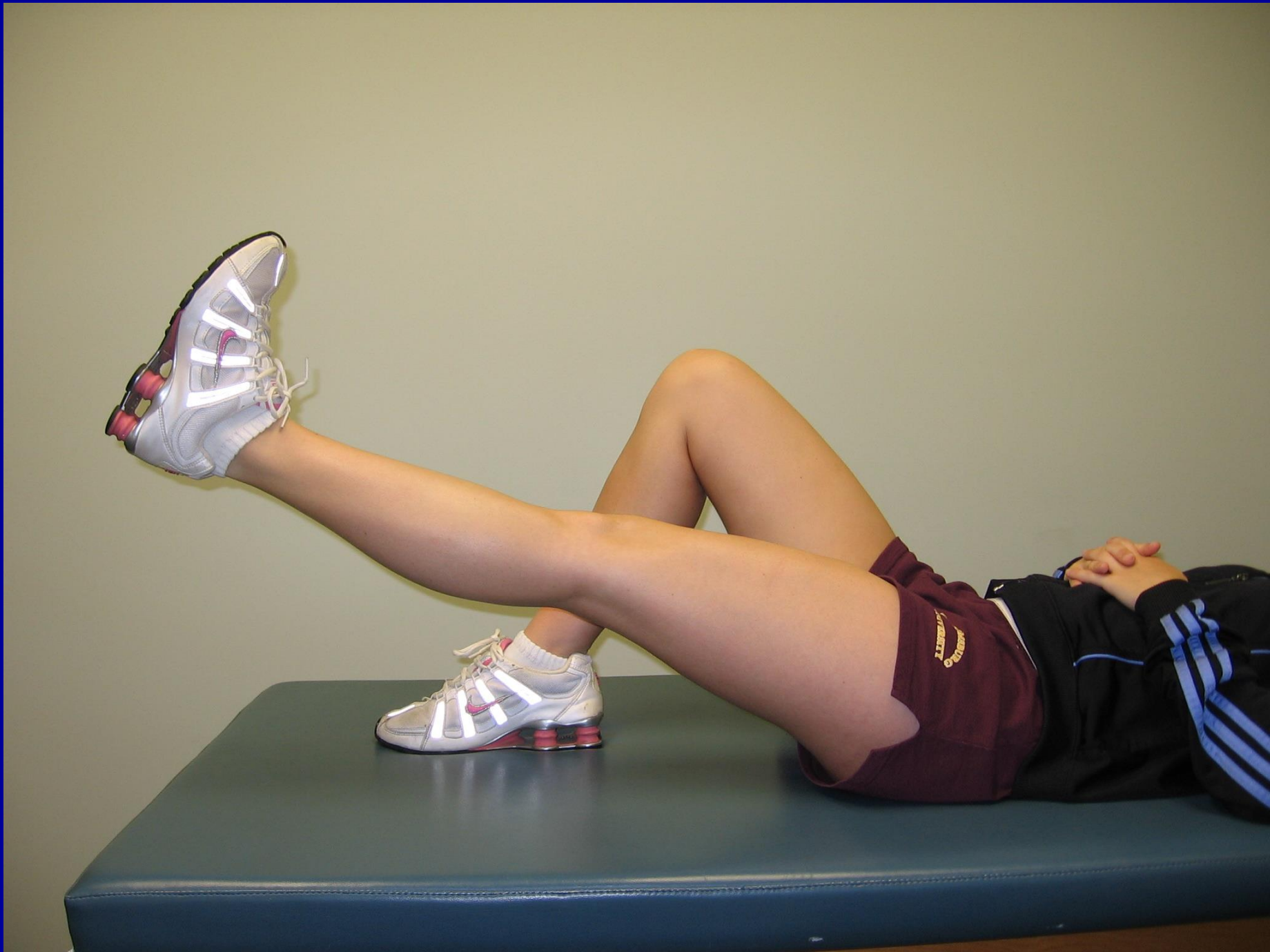
- 60 – 85 degree are greater than 35 – 60 degree
- 60 – 85 degree are greater than 10 – 35 degree
- 35 – 60 degree are greater than 10 – 35 degree

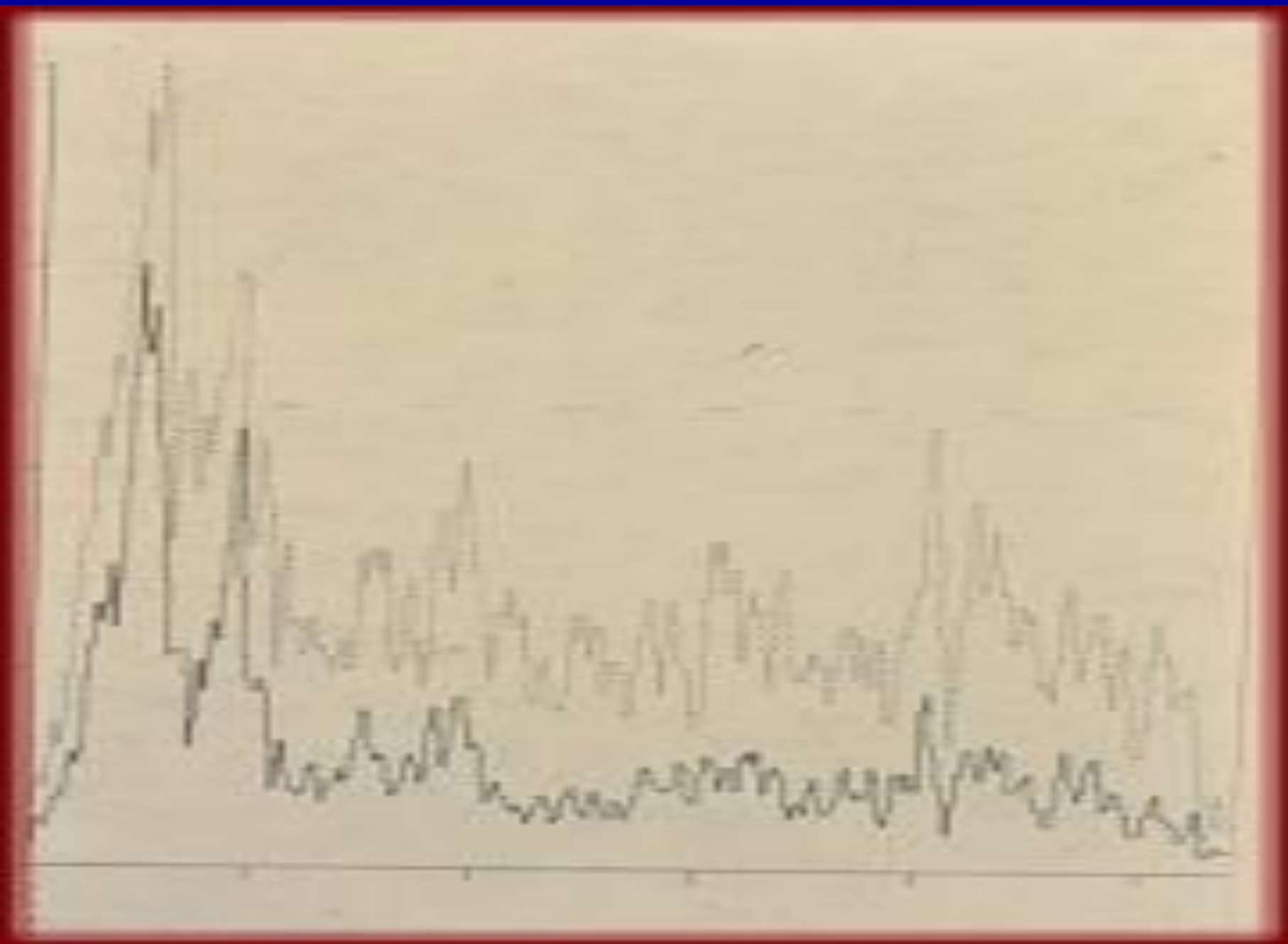
Patella-Femoral Joint Stress During Weight-Bearing and Non-Weight-Bearing Quadriceps Exercises

- OKC – PRE type exercises performed 90° - 45°
- CKC – Squat type exercises performed 45° - 0°

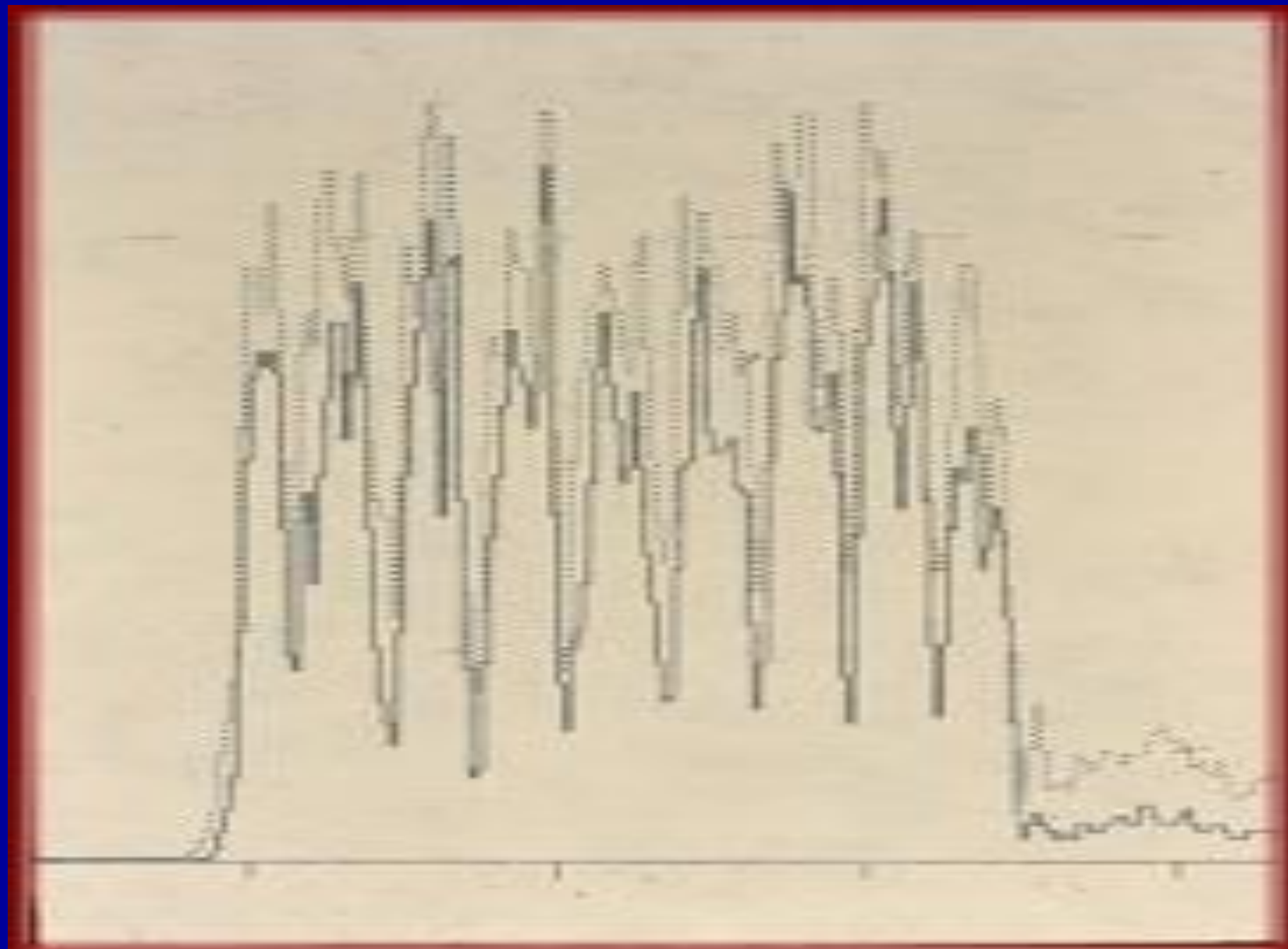
Reference: Powers CM et. al. JOSPT: May 2014











Hip (Core) Strengthening

Research:

- Females with PFPS – Hip abductors strength impairment of 27% and hip external rotation impairment of 30% (mode of contraction: Isometric)

Reference: Robinson and Nee 2007

- Females subjects – isometric testing: 24% less strength in external rotators and 26% less strength in hip abductors

Historical Reference: Bolgla, Malone, Umberger, Uhl – 2008

Reference: Caldera F, Plastaras C 2016

- Based on isokinetic eccentric testing in both males and females with PFPS:
 - 18% less hip abduction
 - 17% less hip external rotation
- During single-leg squat, the female subjects with PFPS had less muscles activation of the gluteus medius.

Reference: Nakagawa TH, et. al. 2012







Therapeutic Value of this Research

- Proximal strengthening of the hip core
- Eccentric emphasis of Abduction and external rotators
- Open kinetic chain
 - Hip abduction – standing and side-lying
 - Side-lying clam
- Closed kinetic chain
 - Wall squats
 - Lateral and front step-up
 - Balance vectors

Reference: Kooiker L, et. al. - 2014

Closed Kinetic Chain Recruitment

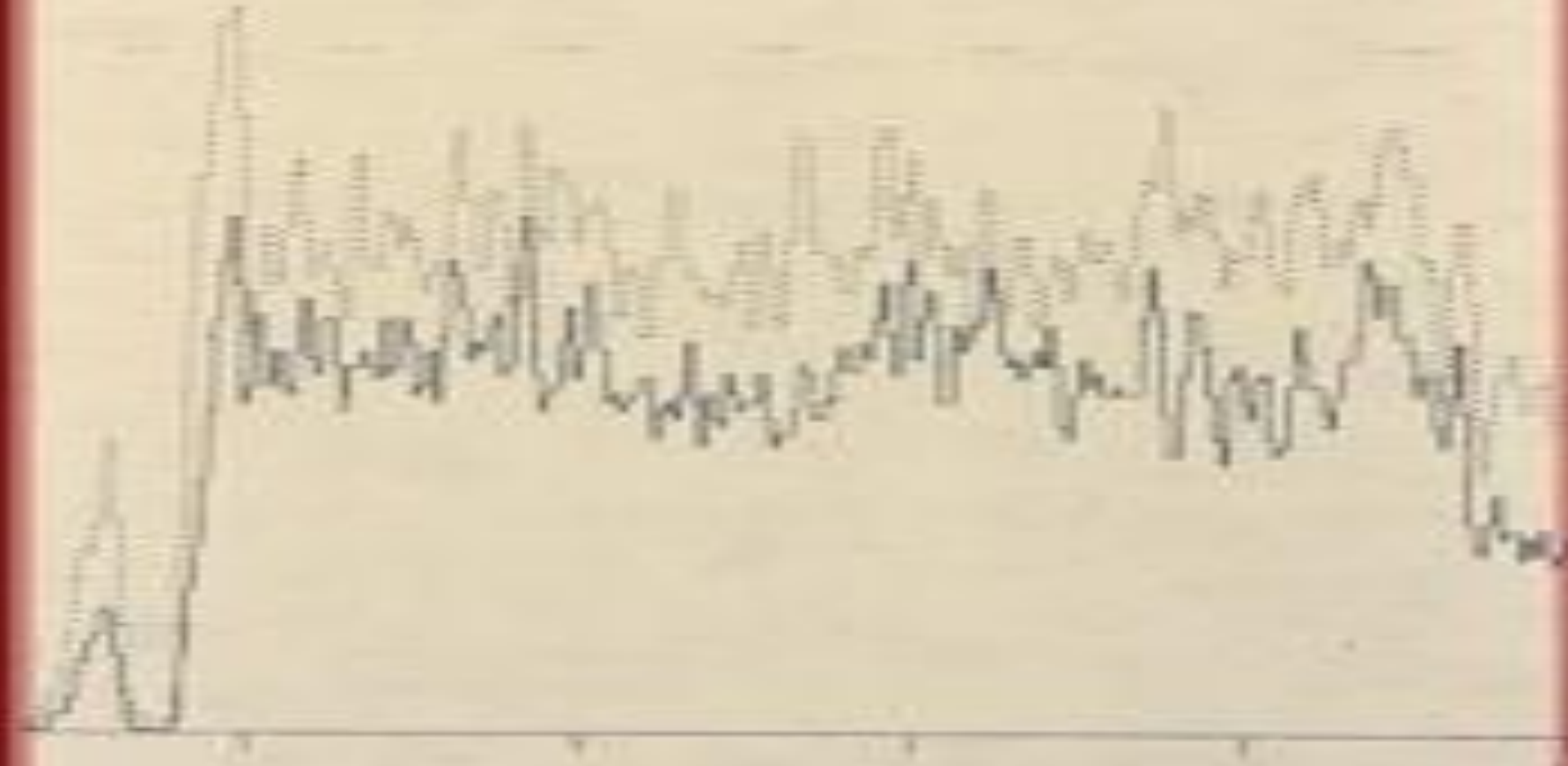
- Mini-squats with adduction – increase of VMO activation
- Balance Vectors – Tri-plane on floor to uneven surfaces – proprioception
- Leg-press – Total Gym
- Lateral Step-up – Advanced VMO training
- Dead-lift with mini-squat
- Wall-slides – single leg
- Lunges – VMO: VL ratio - 1:1



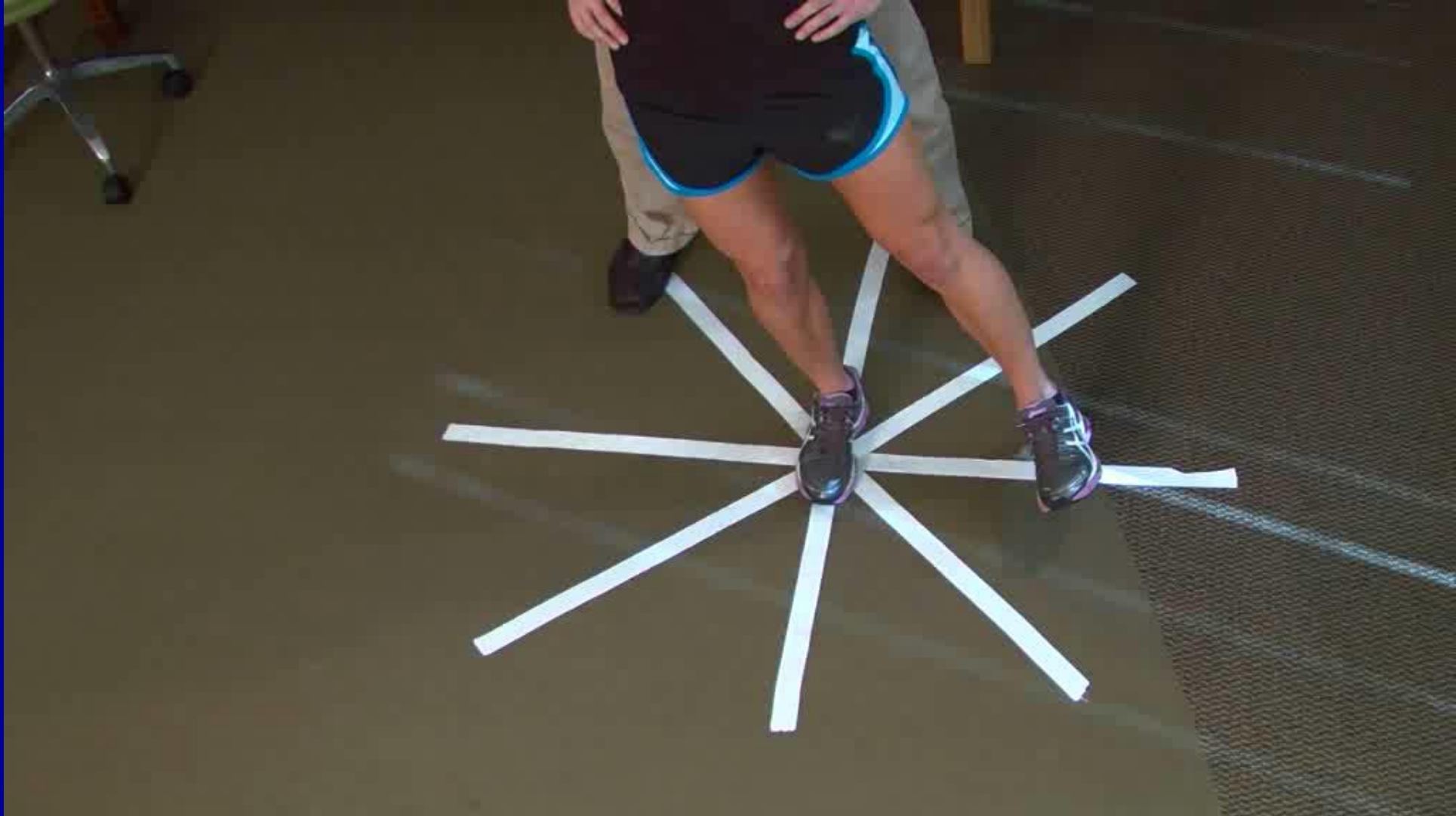












Balance Vector Training

- Sagittal Plane – Less Difficult: Vector 1 and 5
- Transverse Plane – More VMO Recruitment
– Vectors 2, 4, and 6
- Frontal Plane – More Difficult: Vector 3

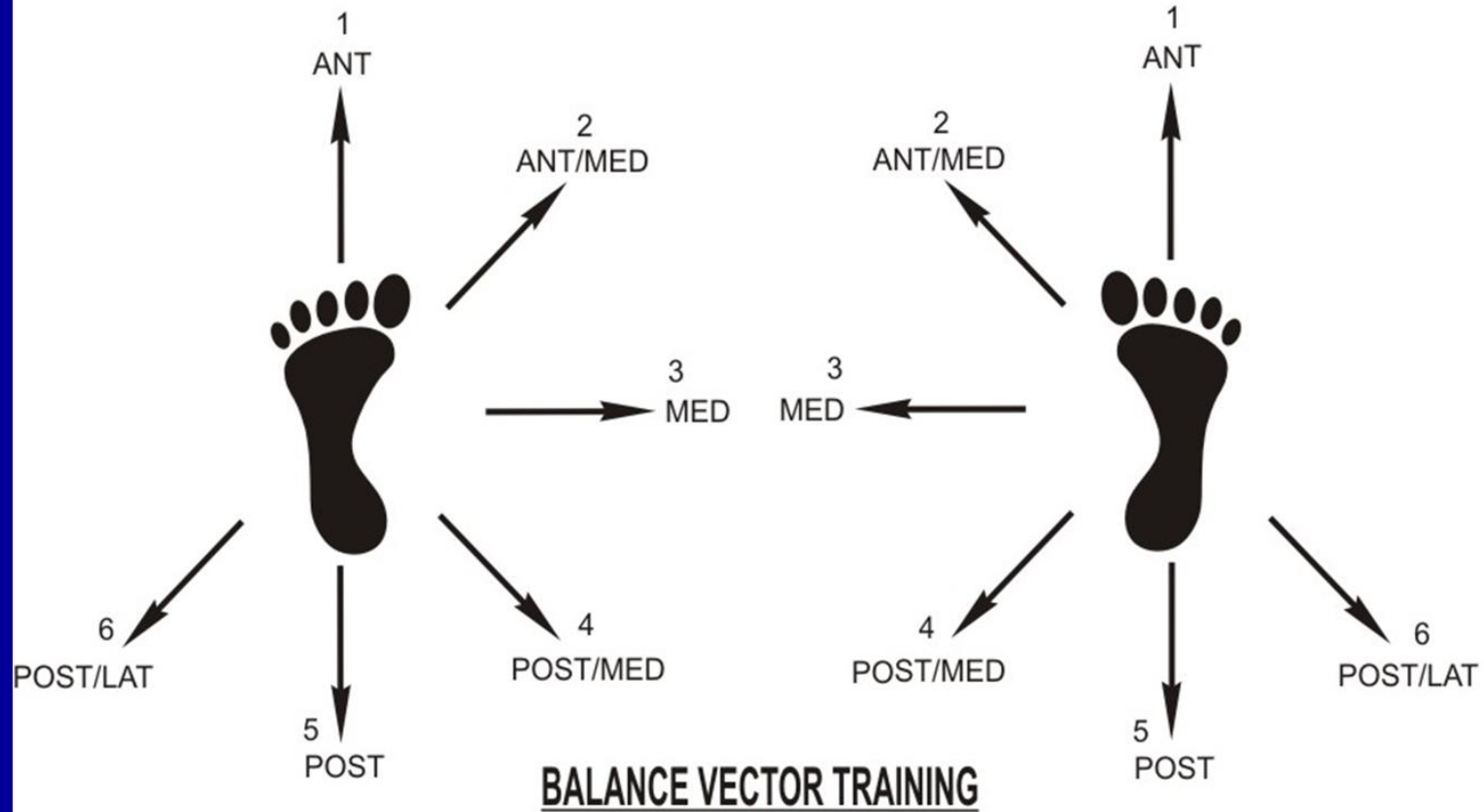
Clinical Commentary: Athletic Rehab Institute
(ongoing study)

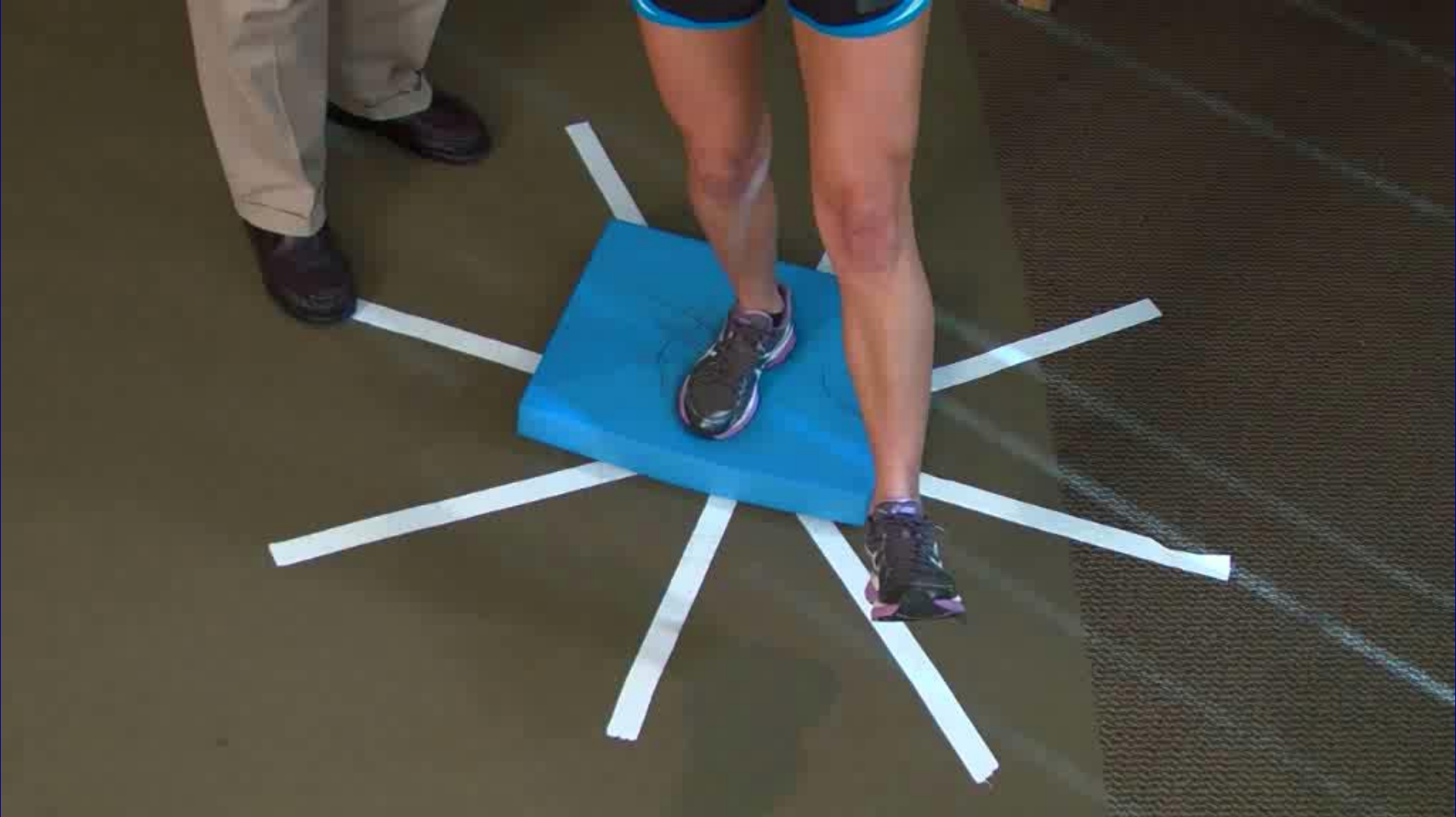
TT 553

Heel to Toe Mini Squat

Sagittal Plane 1-5
Transverse Plane 2-4-6
Frontal Plane 3

5 seconds
5 reps
3 planes











Tension

- Inability to dissipate loads
- DJD concerns
- Muscle – tendon strain patterns
- Tendonitis or tendonosis

Recommendations for Therapeutic Interventions

- Emphasis on eccentric exercises-including hip abduction and rotation
- Use of decompression exercises – co-activation H/Q
- Pain/Creptus free exercise motion zone (OKC & CKC)
- Take your time with progression 10-12 weeks rule (T. Malone)

Friction

- Soft tissue pain with repetitive exercise
- Bursitis
- ITBand syndrome
- Fat Pad syndrome
- Plica syndrome

Reference: Sanchis-Alfonso V, Dye SF
Sports Health 2016

Recommendations of Therapeutic Interventions

- Avoid repetitive stress – flexion to extension loading
- Begin with isometrics (MAI)
- Partial arc of motion – pain free (SAF-Quads)
- Decompression – co-activation
- Eccentric hamstrings and hip strengthening

Compression

- Patella – femoral overloading
- Weight bearing overload
- Articular Cartilage defects
- OA
- Abnormal muscular Absorption – overall weakness of the kinetic chain

Recommendations of Therapeutic Interventions

- Partial angle exercises
 - Isometric (MAI)
 - Short –arc(Flexion moment arm)
- Decompression co-activation
- Avoid full arc loading
- Use both OKC and CKC but always pain free

Questions

