Legwork Differential: Hip to Heel Specialized Examination

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Objectives

- Review components of a comprehensive musculoskeletal physical exam.
- Identify specialized musculoskeletal exams for the lower extremity.
- Demonstrate appropriate specialized musculoskeletal exam techniques.
- Recognize positive findings.
- Correlate physical exam findings with differential diagnosis.

Components of Musculoskeletal Physical Examination

- Inspection
- Palpation
- Range of motion
  - Active typically followed by passive
- Neurologic
  - Sensory and motor
- Peripheral vascular
- **Specialized Exams**

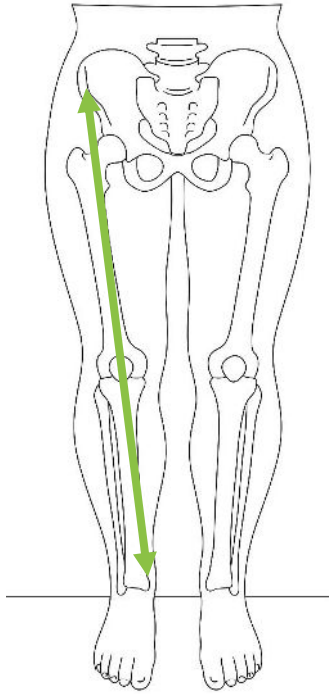
Hip

Leg Length Discrepancy

Galeazzi

Align flexed knees while patient is supine and observe for asymmetry

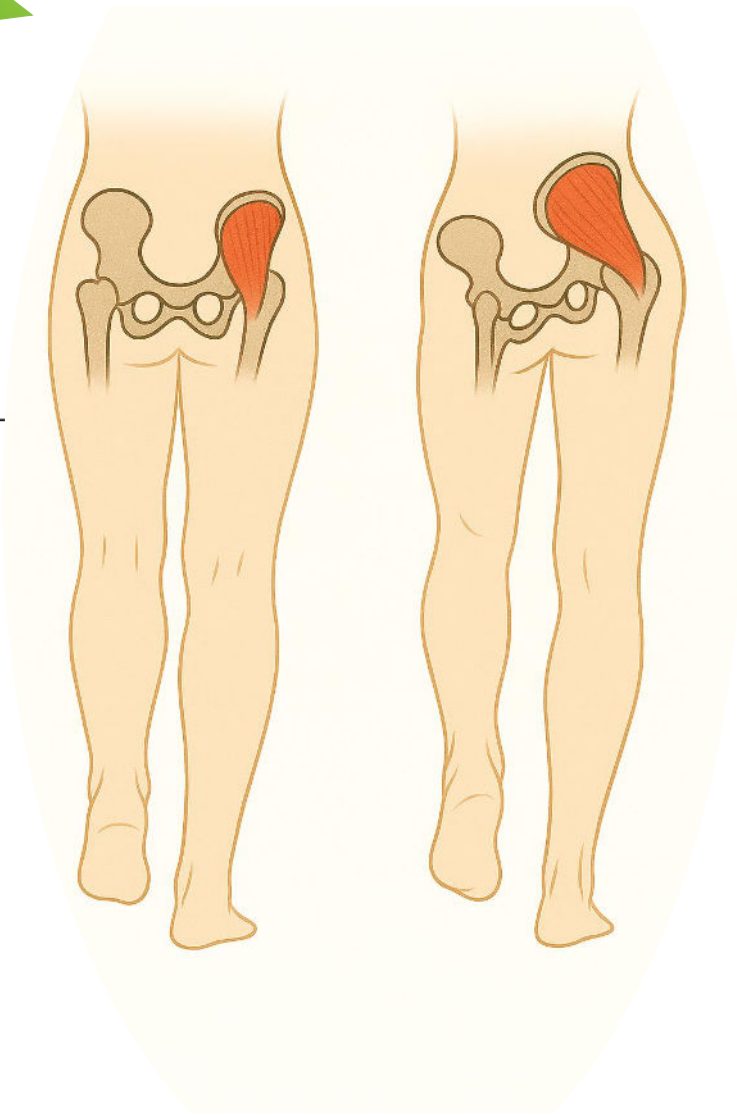
Measurement



ASIS (anterior superior iliac spine) → medial malleolus of the ankle

Trendelenburg Sign

Patient stands on affected lim
while lifting contralateral limb



- Positive: Pelvic tilt toward the unaffected side

- Indications: Hip abductor weakness

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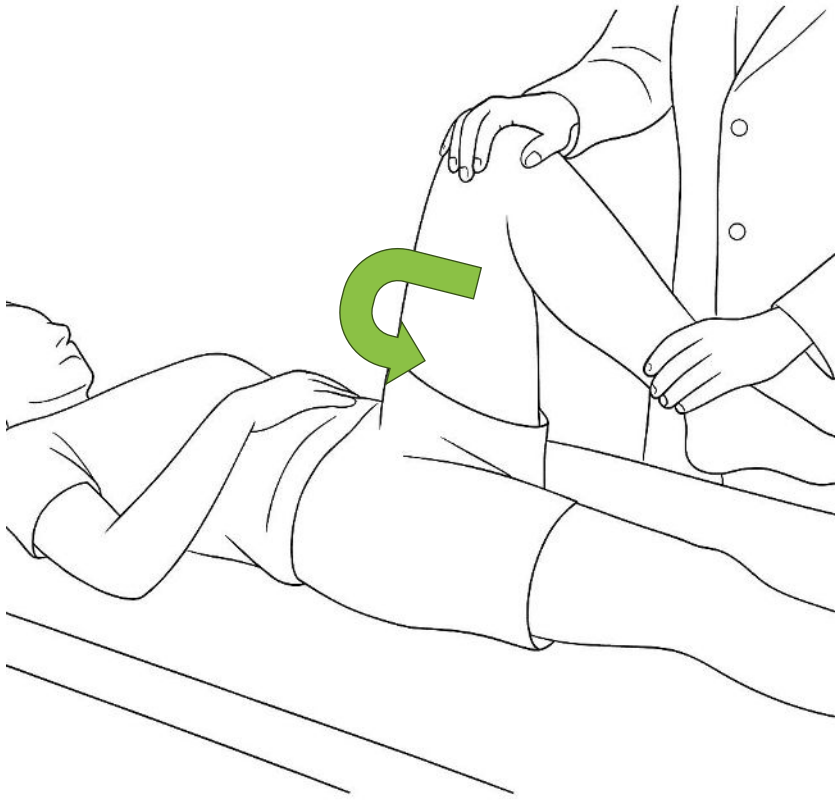
F**AD**IR
(Impingement Test)

With the patient supine passively provide:
Hip **F**lexion, **AD**duction, **I**nternal **R**otation

- Positive: Reproduction of anterolateral hip pain

- Indication: Hip labral tears, FAI, intra-articular pathology



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F**AB**ER
(Patrick Test, Figure-of-Four)

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With the patient supine passively provide:

Hip **F**lexion, **AB**uction, **E**xternal **R**otation

Allow the foot to rest at the knee

Stabilize the contralateral hip

Apply downward pressure at the knee

- Positive: Reproduction of groin pain (hip pathology) or posterior pain (SI joint)

- Indications: Hip labral tears, FAI, sacroiliac joint pathology

Additional Tests for Labral Tears

Arlington

Hip ranged from FABER to FADIR while applying subtle internal and external rotation motion

Twist Test

Internal and external rotation of hip while weightbearing

Positive: Reproduction of anterior hip pain

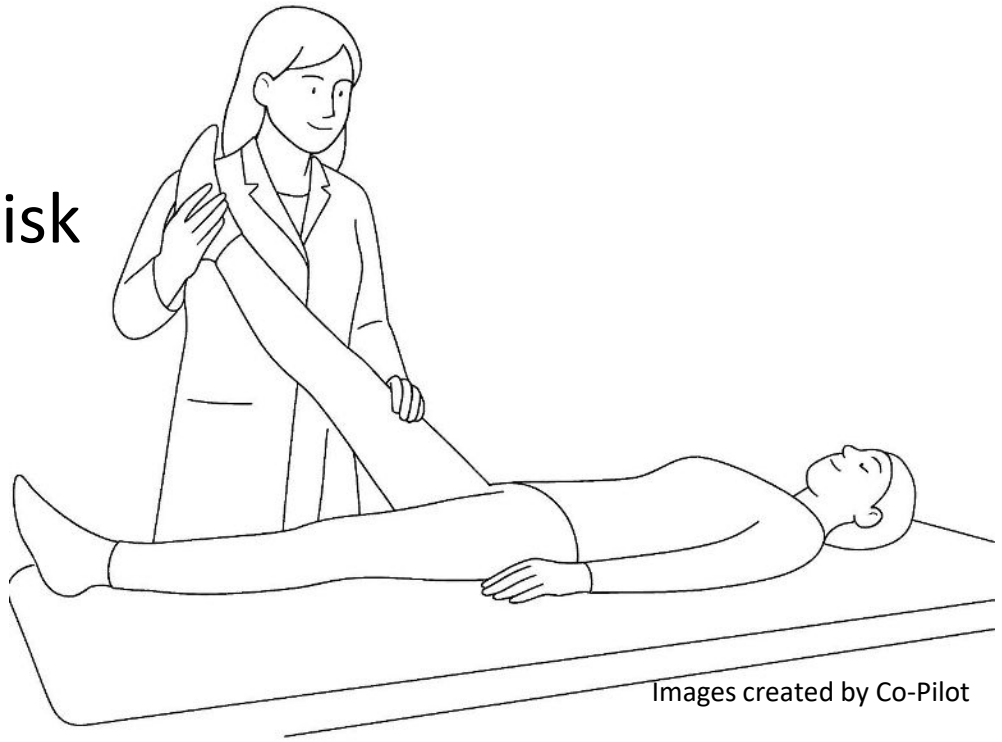
Adib F, Hartline J, Donovan JS, Kalachi K, Dehghan P, Ochiai D. Two Novel Clinical Tests for the Diagnosis of Hip Labral Tears. Am J Sports Med. 2023 Mar;51(4):1007-1014. doi: 10.1177/03635465221149748. Epub 2023 Feb 20. PMID: 36803076.

Straight Leg Raise

Passive hip flexion with knee extended while supine

- Positive: Reproduction of radicular leg pain (disk herniation) or posterior thigh pain (hamstring tightness)

- Indications: Lumbar radiculopathy, hamstring tightness



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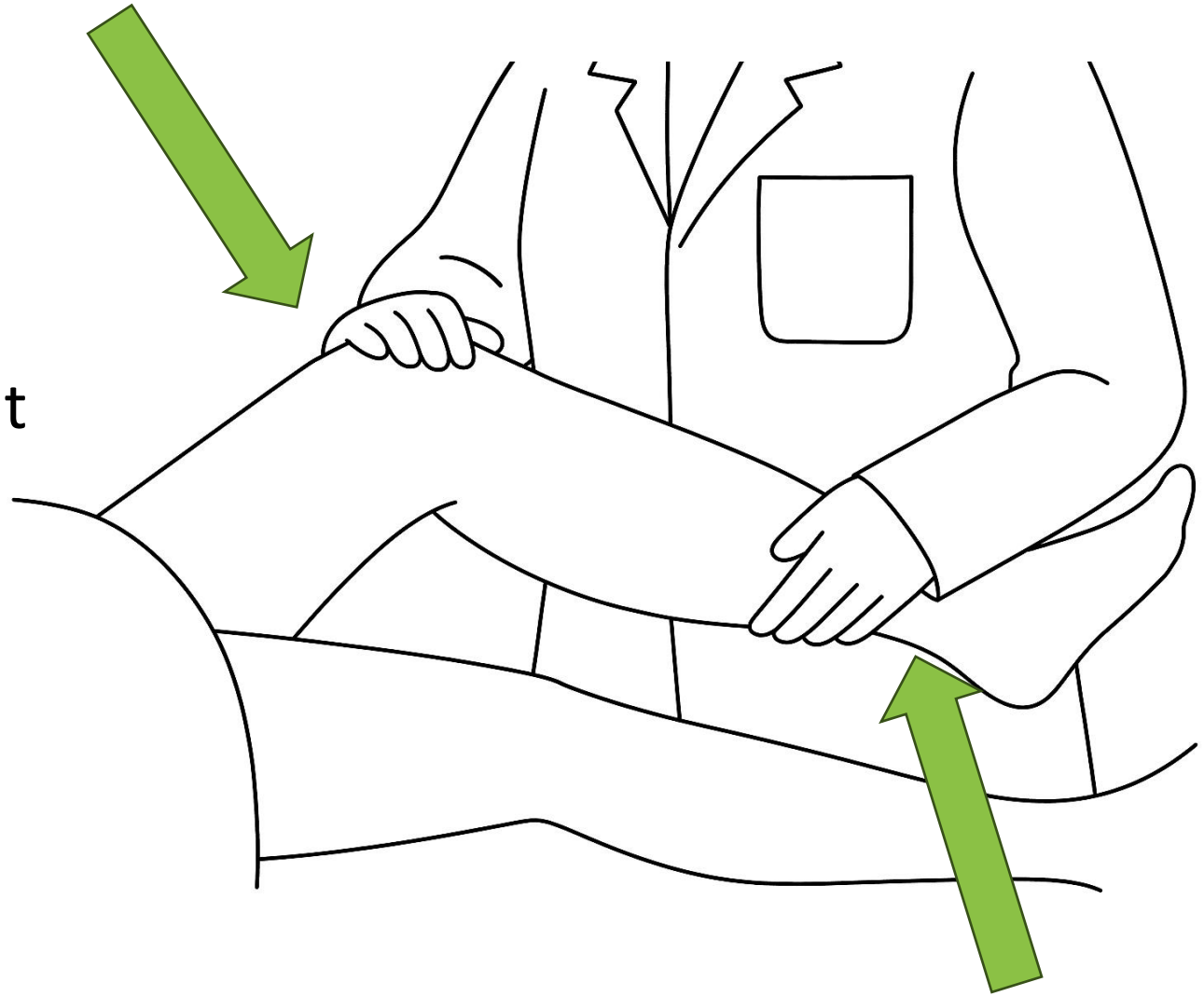
*Crossed Straight Leg: Exam performed on the contralateral leg and reproduces pain on the affected side

Knee

Valgus Stress Test (MCL)

Lateral force applied to knee at 0° and 30° flexion

- Positive: Pain or medial joint space laxity
- Indication: MCL injury/tear



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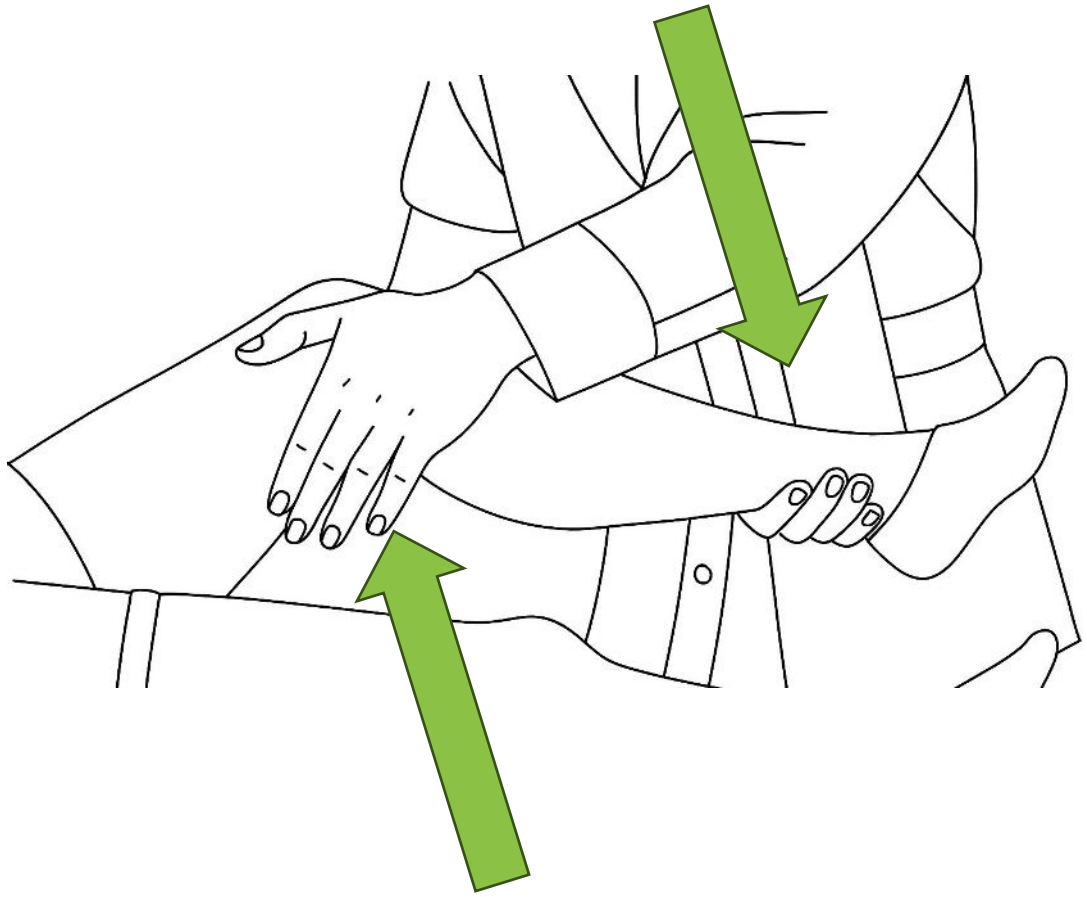
Varus Stress Test (LCL)

Medial force applied to knee at 0° and 30° flexion

- Positive: Increased lateral joint space opening and/or pain
- Indication: LCL injury/tear



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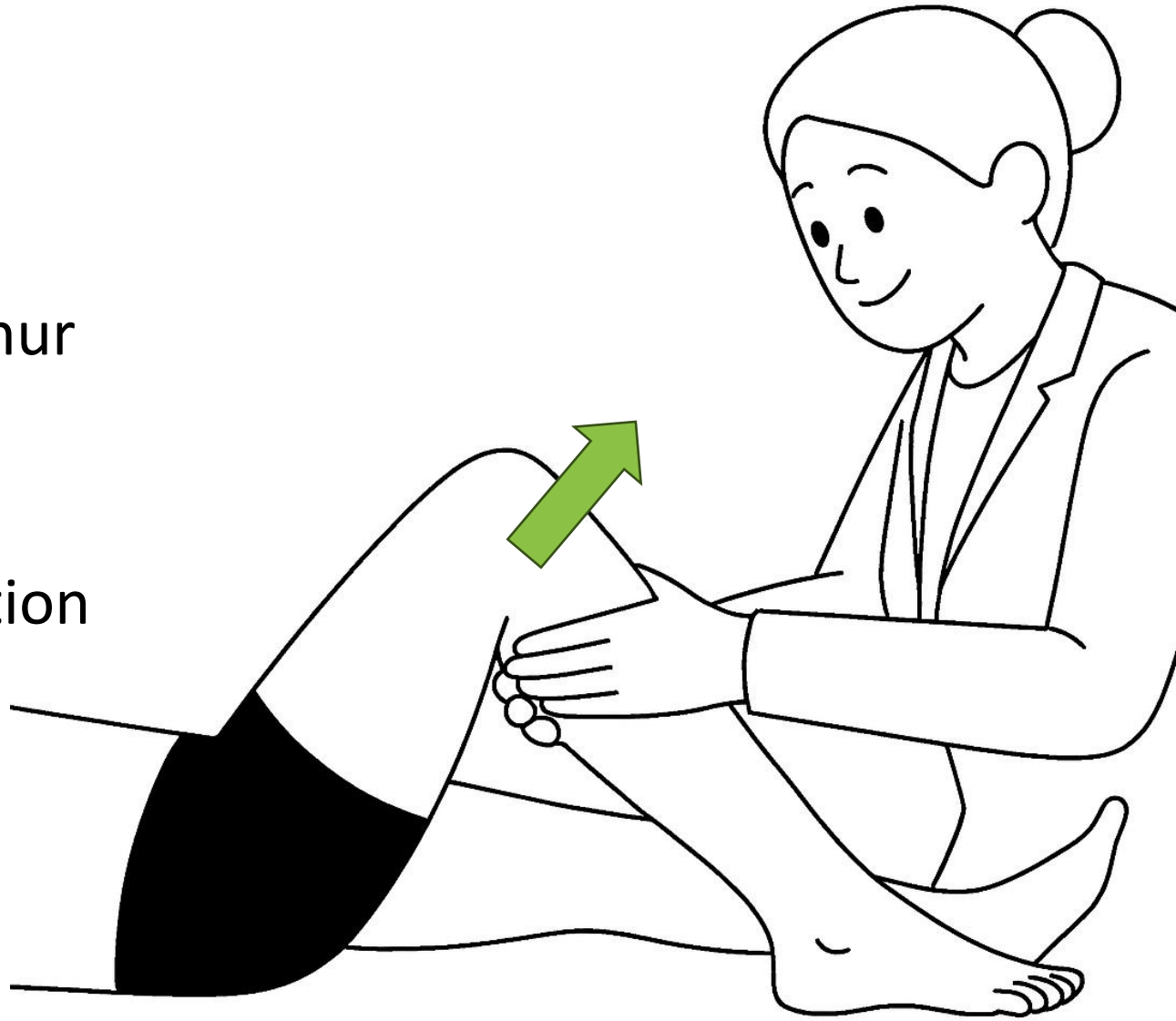
Anterior Drawer (ACL)

Anterior displacement of tibia on femur with knee flexed 90°

- Positive: Increased anterior translation of tibia

- Indication: ACL injury/tear



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Lachman (ACL)

Anterior displacement of tibia on femur with knee flexed 20-30°Patient in supine position

- Positive: Increased anterior translation and/or soft endpoint
- Indications: ACL injury/tear

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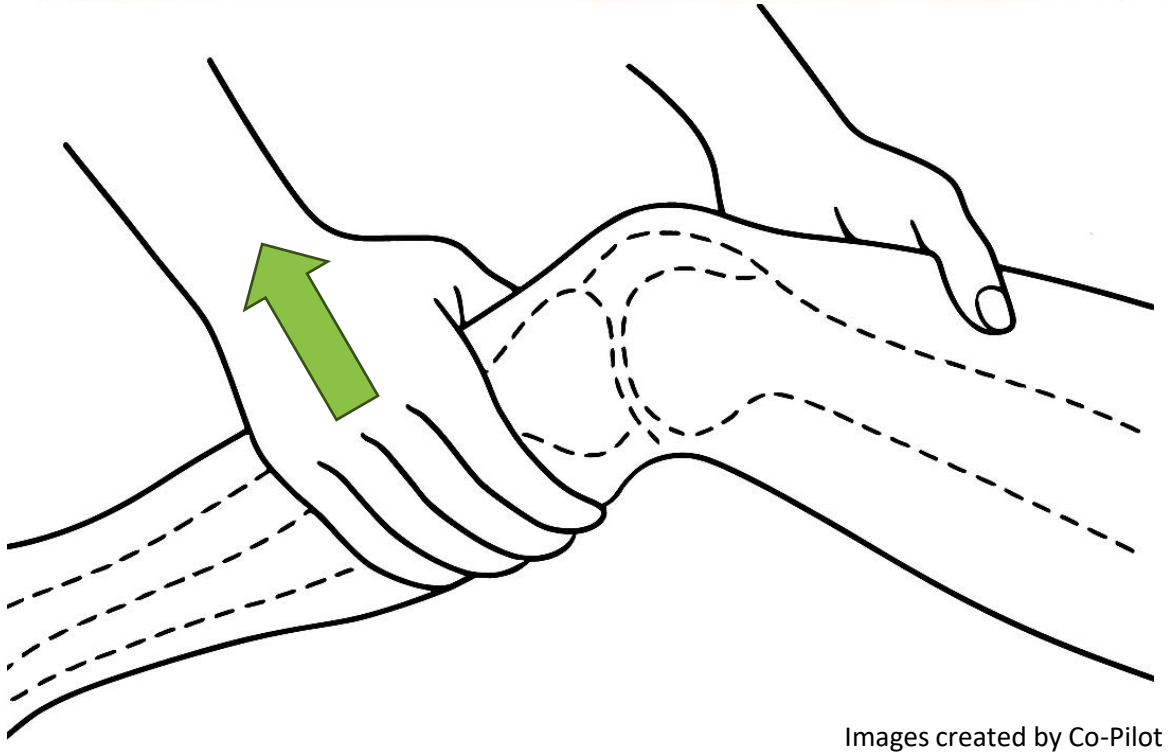

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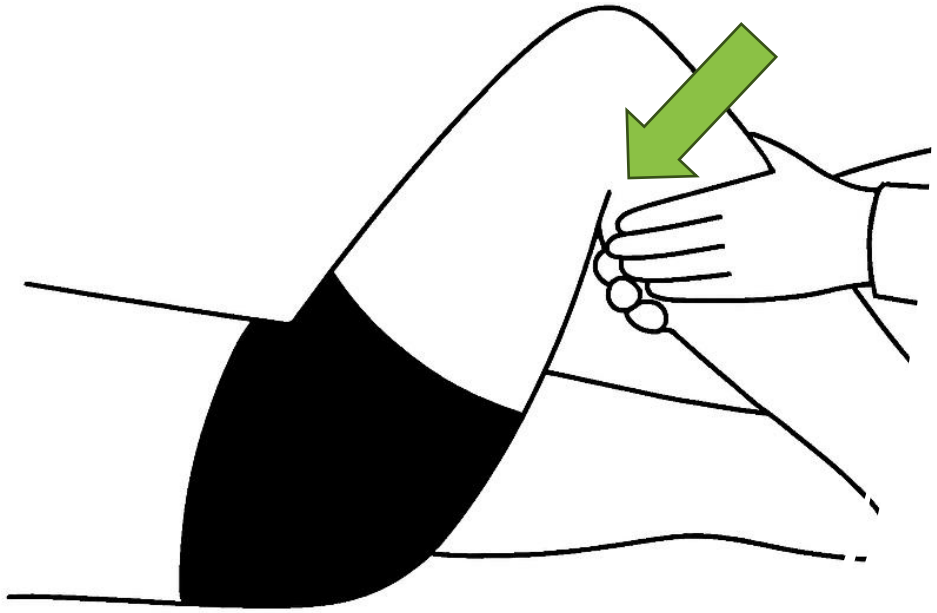

Posterior Drawer Sign

Posterior displacement of tibia on femur with knee flexed 90°

- Positive: Increased posterior translation of tibia

- Indications: PCL injury/tear

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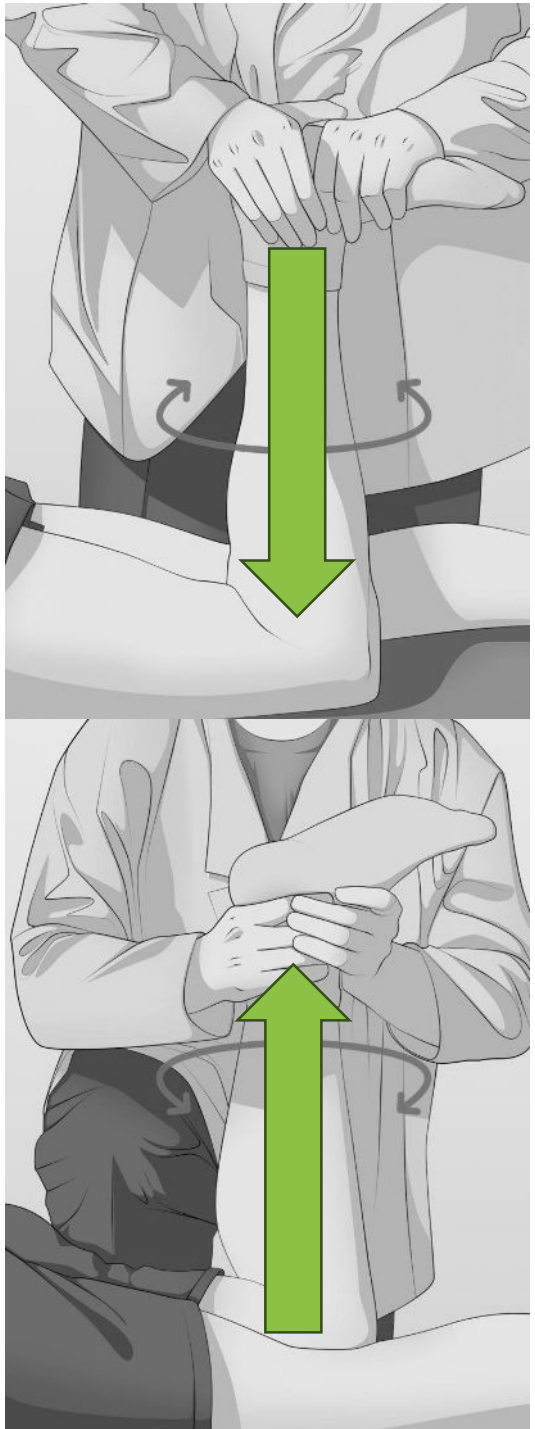
Apley Grind (Compression) and Distraction Tests

Axial compression with tibial rotation while patient prone, knee flexed 90°. Repeat with axial distraction.

- Positive:
  - Pain with compression relieved with distraction (meniscus)
  - Pain with distraction (ligament)
- Indications:
  - Meniscal injury/tear (compression)
  - Ligamentous injury/tear (distraction)



McMurray Test

Concurrent knee rotation and extension from flexed position

Medial meniscus

- Externally rotate at heel, flex maximally, then slowly extend the knee while providing (*valgus)* stress to knee

Lateral meniscus

- Internally rotate at the heel, flex maximally, then slowly extend the knee while providing (*varus)* stress to knee

Positive: Palpable or audible click/pop with pain at joint line

Indication: Meniscal tear

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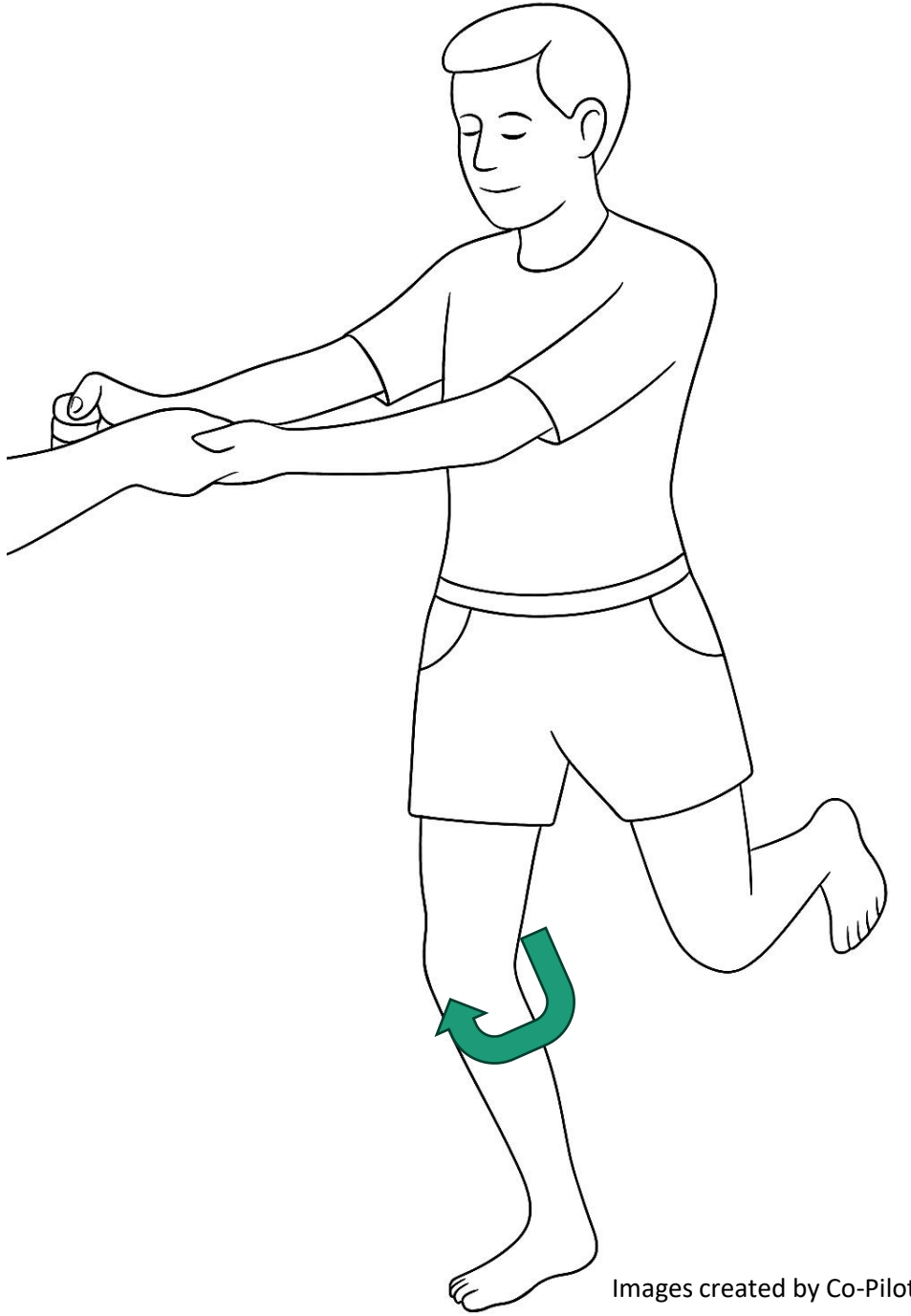
Thessaly Test

Patient stands on affected leg, knee flexed 20°, rotates body internally and externally

Positive: Pain and/or catching sensation at joint line

Indications: Meniscal tear



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Lower Leg/Ankle

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Squeeze Test

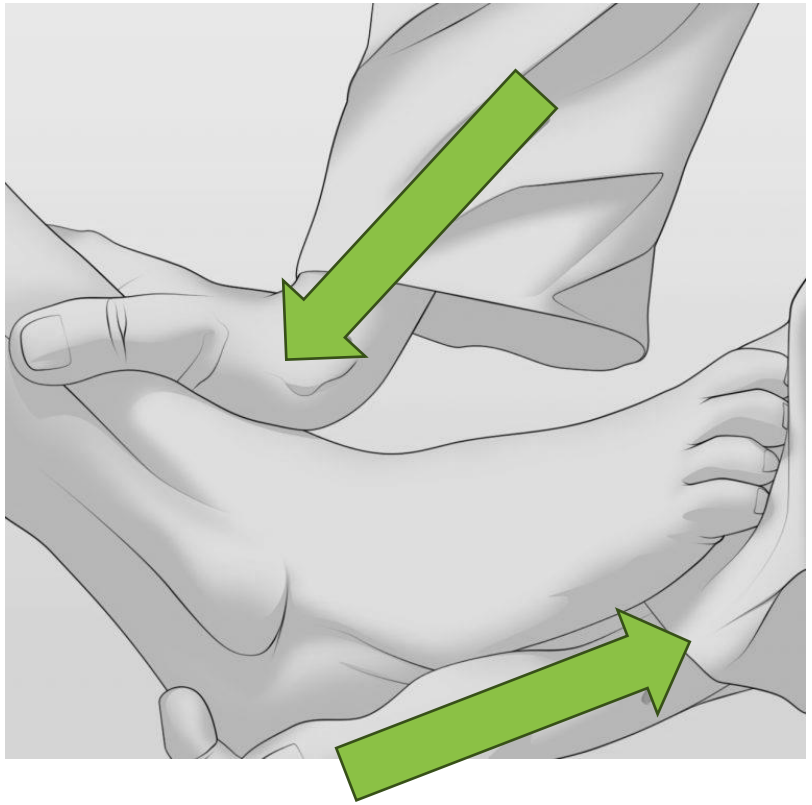
Compress tibia and fibula together at mid-calf

- Positive: Pain at distal syndesmosis
- Indications: High ankle sprain (syndesmotic injury)

Anterior Drawer Test of Ankle

Stabilize distal tibia/fibula, apply anterior force to calcaneus with ankle in neutral or slight plantarflexion

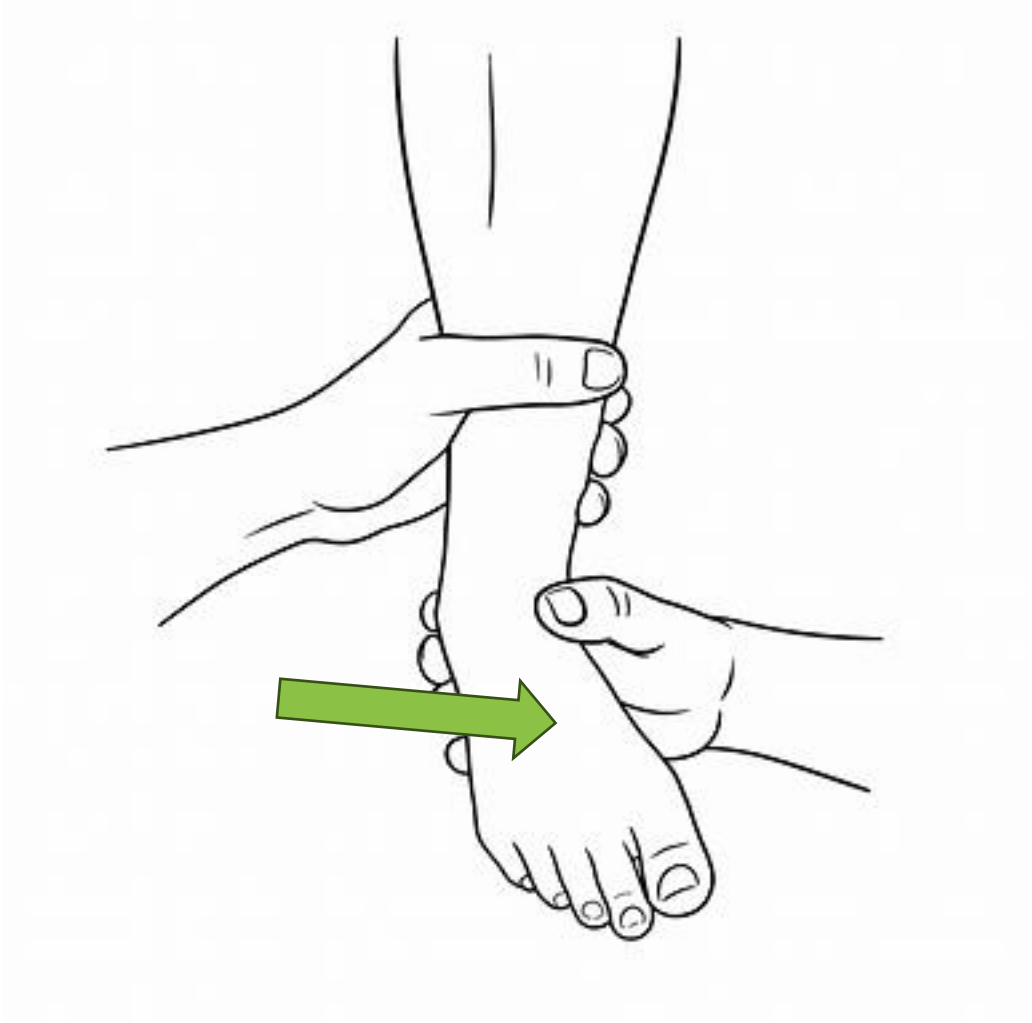
- Positive: increased anterior translation of talus compared to contralateral side
- Indications: ATFL injury/tear



Talar Tilt

Apply inversion stress to calcaneus with ankle in neutral position

- Positive: Increased inversion compared to contralateral side, pain
- Indications: CFL injury/tear, lateral ligament complex injury



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Thompson Test

Squeeze calf with patient prone, knee flexed 90°

- Positive: Absence of passive plantarflexion
- Indications: Achilles tendon rupture

Final Tips

- Technique is key!
- Combine tests for accuracy: diagnostic yield increases when maneuvers are interpreted together
- Always examine bilaterally: compare symmetry, strength, and subtle differences
- Practice trauma-informed care: explain steps, respect boundaries, and minimize discomfort
- Document clearly: record both positive and negative findings for clinical context
- Think functionally: link exam findings to real-world mobility and patient goals
- Stay systematic: follow a consistent sequence to avoid missed steps

Resources

- AAOS: http://www.aaos.org/
- POSNA: https://posna.org/
- AAFP: http://www.aafp.org/

- Radiopaedia: http://radiopaedia.org/
- OrthoBullets: https://www.orthobullets.com

- Physiotutors. Images used with permission. Accessed December 5, 2025. https://www.physiotutors.com/

- Books:
  - *Bates' Guide to Physical Examination and History Taking*
  - *Mosby's Guide to Physical Examination*
  - Essentials of Musculoskeletal Care by the American Academy of Orthopedic Surgeons.

References

- Woodward TW, Best TM. The painful shoulder: part I clinical evaluation. *Am Fam Physician.* 2000;61:3079-3088.
- Kulman GS, Domb BG. Hip impingement: identifying and treating a common cause of hip pain. *Am Fam Physician*. 2009;80(12):1429-1434.
- Wilson JJ, Hurukawa M. Evaluation of the patient with hip pain. *Am Fam Physician*. 2014; 89(1):27-34.
- Dixit S, Burton M, Mones B. Management of patellofemoral pain syndrome. *Am Fam Physician*. 2007;75(2):194-202.
- Hing W, White S, Marshall. Validity of the McMurray's test and modified versions of the the test: a systematic review. *J Man Manip Ther*. 2009;17(1):22-35.
- Miniaci A, Salonen D. Rotator cuff evaluation imagine and diagnosis. *Orthop Clin North Am*. 1997;28:43-58
- Bolander, S. A click is not a clunk: developmental dysplasia of the hip in a newborn. *Clinician Reviews.* 2016;26(4):22-34.
- Bickley LS, Szilagyi PG, Hoffman RM. Chapter 16: The musculoskeletal system. In Bates' guide to physical examination and history taking. 12th ed. Wolters Kluwer; 2017.