Physical Therapy Evaluation of the Athletic Hip

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Disclosures

I have no relevant disclosures.

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Objectives

The audience will:

1. Identify common Athletic Hip pathologies and their relevance to practice
2. Differentiate Hip pathology from other body area pathology
3. Identify efficient strategies for evaluating the Athletic Hip in clinic
4. Identify relevant special tests selected based on history and differential

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Relevance to Practice

- Athletic hip injuries comprise 5-9% of injuries in athletes across all ages. [7]
- Multifactorial etiology
  - Acute vs. chronic
  - Intracapsular vs. Extracapsular
  - Contact vs. indirect contact vs. non-contact
- Increasing diagnostic, pathoanatomic and procedural knowledge accuracy in the past several years leading to increased research and recognition. [7]

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Relevance to Practice

- Several sports with high prevalence:
  - Soccer
  - Hockey
  - Football
  - Cross Country
- Males tend to become more injured in game situations, while females are injured equally in games and practices. [7]
- Non-contact injuries more prevalent with hip injuries, making up 48% [7]

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Relevance to Practice

- Hip injuries in sport typically lead to time loss of as little a 1-2 weeks to several months.
- Nationally only 1.3% of acute injuries require surgery [7].
- Preseason injuries more likely than in-season and competition more likely than practice.
- Injuries measured in terms of exposures.
  - More episodes of participation equates to higher total risk volume.

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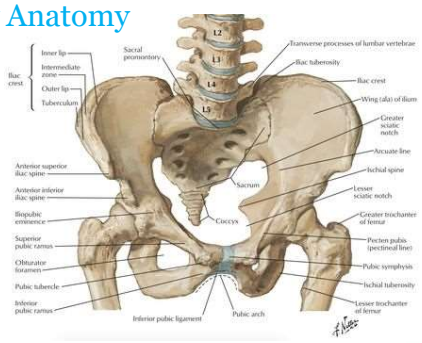
Bony Anatomy



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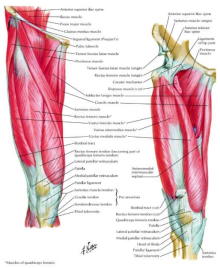
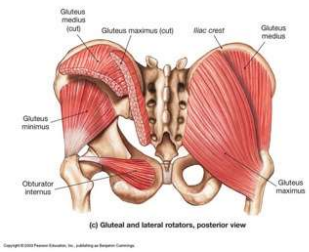
Soft Tissue Anatomy





(c) Gluteal and lateral rotators, posterior view

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Internal Hip vs. External Hip

- Internal
  - Femoroacetabular Impingement (FAI)
  - Labral Tears
  - Loose Bodies
  - Ligamentum Teres Injury
  - Chondral Injury
  - Osteoarthritis
- External
  - Muscle Strain
    - Ie. Adductor, Hamstring, Quad
  - Tendinitis
    - Ie. Iliopsoas, abductor
  - Snapping Hip
  - Bursitis
    - Ie. Greater Trochanter, Ischial
  - Fracture
  - Gluteal Syndrome
  - Athletic Pubalgia
  - SI joint pain

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Exam Philosophy

- Medical/Injury history guides exam
- Positional approach
  - Obtain as much pertinent information as possible before transitioning to another position
- Move from least abrasive to most
  - Attempting to cause least irritation early in exam

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History

- MOI
- Timeframe of complaints
- Pain rating/location/type/symptom description
  - Mechanical symptoms?
- Improvement/worsened with?
  - Movement/activity/position
- Normal activity/sports/job

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Screening for Appropriateness of Care

- Trauma related
- Inability to weight bear
- Abnormal gait
- Arthropathy

- Use clinical judgement to determine if imaging is necessary before further assessment.

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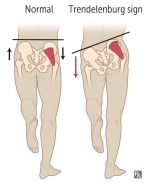
Standing Exam



- General alignment
  - Trunk/pelvic posture
  - Weight bearing position
- Trunk ROM
- Gait evaluation
- Balance/Trendelenberg posture
  - Assessing general functional strength of gluteus group
  - Specific to assessing Glut tendon pathology when painful [11].

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Seated Exam

- ROM
  - Internal Rotation (IR) and External Rotation (ER)
- Neurovascular Exam
  - DTR
  - Sensation
  - Distal Pulses
- Special test
  - Slump Test
    - Differential for posterior hip/thigh complaints
      - Positive indicates sciatica/neuro type symptoms [9]

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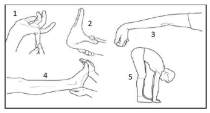
Seated Exam (cont.)



- General Mobility
  - Beighton Score [15]
- Strength
  - Flexion, Knee Extension, Knee Flexion, Hip IR/ER
  - Manual Muscle Test or Hand-held Dynamometry?
    - HHD reliable and valid for use with lower extremity muscles [2].
      - Strength testing only as accurate on high end as the tester is strong.
    - Be sure you accurately measure the ceiling in athletes!

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Supine Exam

- Palpation/landmarks
- PROM
  - End feels/patient reports are important!
- Special Testing
  - FADDIR Test [14]
    - **F**lexion, **ADD**uction, **I**nternal **R**otation
    - Assessing for FAI – More sensitive than specific but easily performed as screen
  - FABER Test
    - **F**lexion, **Ab**duction, **E**xternal **R**otation
    - Valid for ROM limitation assessment [3]
    - Sensitive for internal hip internal issues but not specific (may lead to false positives)

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Supine Exam (cont.)

- Special Testing (cont.)
  - Posterior Hip joint Impingement test
    - Patient in lying supine hooklying position, test side is passively abducted and held in position of slight ER while extended.
    - Positive is noted with pain posteriorly
    - Not well described in literature
    - May give false positive in cases of snapping hip or…
  - Iliopsoas Tendinitis test
    - Same position but symptoms will typically be noted more anteriorly and may be associated with a click or clunk

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Supine Exam (cont.)

- Ligamentum Teres Test – [10]
  - Newer test item – deficiencies can be seen in dancers and gymnasts with reports of both functional and mechanical instability
  - Patient in supine hookyling position, test side passively flexed to approximately 70 deg., then abducted and oscilated between internal and external rotation
  - Positive with pain at end range IR or ER with good specificity (85%) and sensitivity (90%)

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Supine (cont.)

- Thomas Test
  - Assessment of 1 or 2 joint hip flexor tightness and hip extension range.
  - Commonly positive in numerous populations that deal with hip pain
  - Hooklying position on edge of table with legs below ischial tuberosities suspended. Subject flexes unaffected side while allowing affected side to fall.
  - Positive 1 joint if thigh if not able to obtain neutral, positive 2 joint if complaints are increased with passive knee flexion
  - Only valid if pelvic/lumbar position controlled! [15]

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Supine (cont.)

- HEER Instability Test [6]
  - **H**yper-**E**xtension, **E**xternal **R**otation Test
  - Same position as Thomas Test, passively hyper-extend the hip and then externally rotate. Positive with anterior hip pain.

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Sidelying Exam

- Strength
  - Glut med – again looking at MMT or HHD
- Palpation
- Special Testing –
  - Ober's Test – Iliotibial Band (ITB) tightness
    - Widely used but recently refuted [16]
    - Noted hip adducted angle increase greater with resection of hip capsule

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Sidelying Exam (cont.)

- AB-HEER Instability Test [6]
  - **AB**duction, **H**yper-**E**xtension, **E**xternal **R**otation
  - Sensitive and Specific for anterior instability

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Prone Exam

- Strength – Glut Max
- Muscle Activation patterns
  - Hip Extension sequence altered in some individuals [1]
- Palpation/landmarks
- Special Testing
  - Ely Test
    - Patient prone, passively flex the knee to available end range. Positive if heel cannot reach buttock, pain is reported or ipsilateral hip elevates off the table.
    - Moderately reliable and specific in clinical setting. [10]

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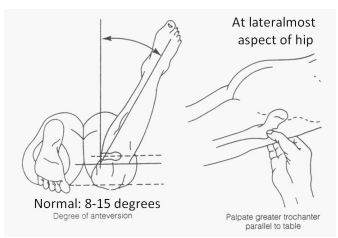
Prone Exam

- Special Testing (cont.)
  - Craigs Test – assessing femoral anteversion
    - Palpate greater trochanter as hip is internally and externally rotated to identify the trochanter at it's most prominent
    - 8-15 degrees in internal rotation is considered normal. Greater than 15 deg. considered excessively anteverted. Less than 8 deg. is considered retroverted.



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Prone Exam (cont.)

- Prone Instability Test – assessing anterior hip joint instability [6]
  - Patient prone with knee flexed to 90 deg, while tester passively externally rotates the hip and places an anteriorly directed force on the posterior greater trochanter
  - Positive test with reproduction of complaints anteriorly

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Putting it Together

- Synthesize your differential diagnosis
- Care planning and timelines
- Communicate with healthcare team
  - Patient
  - Family
  - Physician
  - Athletic Trainer
  - Strength/Performance Coach
  - Primary Sport Coach

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What comes next….

- Prognosis
  - Most common question from athletes/parents/coaches “How long is he/she out?”

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Prognosis Factors

- Severity
- Injury location
- Activity demands
- Patient/personal factors
  - Compliance
  - Activity tolerance
  - Support
  - Outside pressure
  - Financial

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Conclusion

- Thorough history is crucial to differential and efficient exam.
- Screen for appropriateness of evaluation/imaging/treatment.
- Physical exam should focus on appropriate tests and measures to accurately identify structures affected and guide evaluation.
- Determine treatment and care planning/prognosis.
- Communicate with healthcare/sports team to ensure optimal outcomes and expectations.

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References

1. Arab, A., Ghamkhar, L., Emami, M. and Nourbakhsh, M., 2011. Altered muscular activation during prone hip extension in women with and without low back pain. *Chiropractic & Manual Therapies*, 19(1).
2. Arnold, C., Warkentin, K., Chilibeck, P. and Magnus, C., 2010. The Reliability and Validity of Handheld Dynamometry for the Measurement of Lower-Extremity Muscle Strength in Older Adults. *Journal of Strength and Conditioning Research*, 24(3), pp.815-824.
3. Bagwell, J. J., Bauer, L., Gradoz, M., & Grindstaff, T. L. (2016). THE RELIABILITY OF FABER TEST HIP RANGE OF MOTION MEASUREMENTS. *International journal of sports physical therapy*, *11*(7), 1101–1105.
4. Choi, B. and Kang, S., 2015. Intra- and inter-examiner reliability of goniometer and inclinometer use in Craig's test. *Journal of Physical Therapy Science*, 27(4), pp.1141-1144.
5. Frangiamore, S., Mannava, S., Geeslin, A., Chahla, J., Cinque, M. and Philippon, M., 2017. Comprehensive Clinical Evaluation of Femoroacetabular Impingement: Part 1, Physical Examination. *Arthroscopy Techniques*, 6(5), pp.e1993-e2001.
6. Hoppe, D., Truntzer, J., Shapiro, L., Abrams, G. and Safran, M., 2017. Diagnostic Accuracy of 3 Physical Examination Tests in the Assessment of Hip Microinstability. *Orthopaedic Journal of Sports Medicine*, 5(11), p.2325967117774012.
7. Kerbel, Y., Smith, C., Prodromo, J., Nzeogu, M. and Mulcahey, M., 2018. Epidemiology of Hip and Groin Injuries in Collegiate Athletes in the United States. *Orthopaedic Journal of Sports Medicine*, 6(5), p.2325967117877167.
8. Makovicka, J., Chhabra, A., Patel, K., Tummala, S. and Hartigan, D., 2019. A Decade of Hip Injuries in National Collegiate Athletic Association Football Players: An Epidemiologic Study Using National Collegiate Athletic Association Surveillance Data. *Journal of Athletic Training*, 54(5), pp.483-488.
9. Majlesi, J., Togay, H., Ünalan, H. and Toprak, S., 2008. The Sensitivity and Specificity of the Slump and the Straight Leg Raising Tests in Patients With Lumbar Disc Herniation. *JCR: Journal of Clinical Rheumatology*, 14(2), pp.87-91.
10. Marks M C, Alexander J, Sutherland D H, Chambers H G. 2003. Clinical utility of the Duncan-Ely test for rectus femoris dysfunction during the swing phase of gait. *Developmental Medicine & Child Neurology* 2003, 45: 763–768

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References

9. Maslowski, E., Sullivan, W., Forster Harwood, J., Gonzalez, P., Kaufman, M., Vidal, A. and Akuthota, V., 2010. The Diagnostic Validity of Hip Provocation Maneuvers to Detect Intra-Articular Hip Pathology. *PM&R*, 2(3), pp.174-181.
10. O'Donnell J et al. 2014. The ligamentum teres test: a novel and effective test in diagnosing tears of the ligamentum teres. *American Journal of Sports Medicine*. 42(1):138-43.
11. Pasic, N et al. 2014. Diagnostic Validity of the Physical Examination Maneuvers for Hip Pathology: A Systematic Review. *Kinesiology Publications*. 12.
12. Peeler, J. and Anderson, J., 2007. Reliability of the Thomas test for assessing range of motion about the hip. *Physical Therapy in Sport*, 8(1), pp.14-21.
13. Reese, N. and Bandy, W., 2003. Use of an Inclinometer to Measure Flexibility of the Iliotibial Band Using the Ober Test and the Modified Ober Test: Differences in Magnitude and Reliability of Measurements. *Journal of Orthopaedic & Sports Physical Therapy*, 33(6), pp.326-330.
14. Shanmugaraj, A., Shell, J., Horner, N., Duong, A., Simunovic, N., Uchida, S. and Ayeni, O., 2018. How Useful Is the Flexion–Adduction–Internal Rotation Test for Diagnosing Femoroacetabular Impingement. *Clinical Journal of Sport Medicine*. Publish Ahead of Print.
15. Smits-Engelsman, B., Klerks, M. and Kirby, A., 2011. Beighton Score: A Valid Measure for Generalized Hypermobility in Children. *The Journal of Pediatrics*, 158(1), pp.119-123.e4.
16. Vigotsky, A. D., Lehman, G. J., Beardsley, C., Contreras, B., Chung, B., & Feser, E. H. (2016). The modified Thomas test is not a valid measure of hip extension unless pelvic tilt is controlled. *PeerJ*, *4*, e2325.
17. Werner, J., Hägglund, M., Ekstrand, J. and Waldén, M., 2018. Hip and groin time-loss injuries decreased slightly but injury burden remained constant in men's professional football: the 15-year prospective UEFA Elite Club Injury Study. *British Journal of Sports Medicine*, 53(9), pp.539-546.
18. Willett et al. 2016. An Anatomic Investigation of Ober's Test. *American Journal of Sports Medicine*, 44 (3), 696-701.

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Thank You!!

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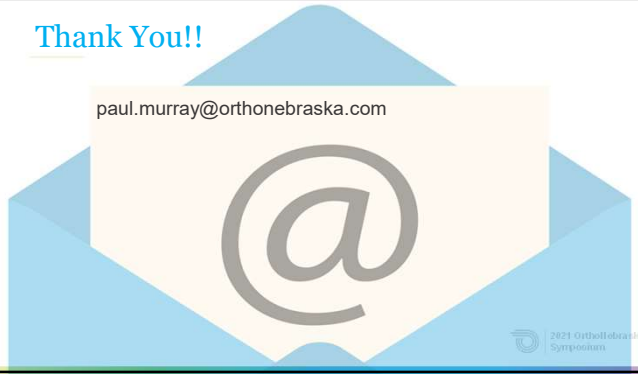

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