PASIG PERFORMING ARTS SPECIAL INTEREST GROUP

ORTHOPAEDIC SECTION AMERICAN PHYSICAL THERAPY ASSOCIATION

APTA American Physical Therapy Association The Science of Healing. The Art of Caring.

PASIG MONTHLY CITATION BLAST: No.63 **August 2011**

Dear PASIG members:

Don't forget to save the date: Combined Sections Meeting 2012 will be held in Chicago, February 8 –11. And please let your students know that the PASIG sponsors an annual student research scholarship. This award is to recognize students, who have had an abstract accepted to CSM, for their contribution to performing arts medicine and research. For more information on the research award please check our webpage (www.orthopt.org/sig_pa.php). Students with additional questions can contact Amy Humphrey (ahumphrey@bodydynamicsinc.com).

PERFORMING ARTS CONTINUING EDUCATION AND CONFERENCES

****Performing Arts Independent Study Couses****

Orthopaedic Section Independent Study Course. *20.3 Physical Therapy for the Performing Artist*.

Monographs are available for:

- Figure Skating (J. Flug, J. Schneider, E. Greenberg),
- Artistic Gymnastics (A. Hunter-Giordano, Pongetti-Angeletti, S. Voelker, TJ Manal), and
- Instrumentalist Musicians (J. Dommerholt, B. Collier).

Contact: Orthopaedic Section at: www.orthopt.org

Orthopaedic Section Independent Study Course. *Dance Medicine: Strategies for the Prevention and Care of Injuries to Dancers*.

This is a 6-monograph course and includes many PASIG members as authors.

- Epidemiology of Dance Injuries: Biopsychosocial Considerations in the Management of Dancer Health (MJ Liederbach),
- Nutrition, Hydration, Metabolism, and Thinness (B Glace),
- The Dancer's Hip: Anatomic, Biomechanical, and Rehabilitation Considerations (G. Grossman),
- Common Knee Injuries in Dance (MJ Liederbach),
- Foot and Ankle Injuries in the Dancer: Examination and Treatment Strategies (M. Molnar, R. Bernstein, M. Hartog, L. Henry, M. Rodriguez, J. Smith, A. Zujko),
- Developing Expert Physical Therapy Practice in Dance Medicine – (J. Gamboa, S. Bronner, TJ Manal).

Contact: Orthopaedic Section at: www.orthopt.org

International Association for Dance Medicine and Science (IADMS) 21st Annual Meeting

October 13 – 16, 2011, Washington DC
Contact: www.iadms.org

Please send information about other courses of interest to our membership to: Amy Humphrey PT, DPT, OCS, MTC; ahumphrey@Bodydynamicsinc.com

For this August Citation BLAST, Lauren Plum has compiled the topic, "*Hip Labral Tears*." The format is an annotated bibliography of articles generally from the last decade. The PASIG Research Committee initiated this monthly Citation BLAST on performing arts-related topics in June 2005 in the hopes of encouraging our members to stay current in the literature and, perhaps, consider conducting research themselves. Each month we send a new list of performing arts (PA) citations to members of the PASIG to further the pursuit of PA-related scholarship. (Information about EndNote referencing software can be found at http://www.endnote.com, including a 30-day free trial).

If you are interested in joining the Research Committee or putting your name forward as the new Research Chair, please contact me. I will step down in February 2012. As always, your comments, suggestions, and entry contributions to these Citation BLASTs are welcome. Please drop me an e-mail anytime.

Regards,
Shaw

Shaw Bronner PT, PhD, OCS
Chair, PASIG Research Committee
sbronner@liu.edu

PASIG Research Committee members
Jeff Stenback, jsptocs2@hotmail.com
Sheyi Ojofeitimi, sojofeit@gmail.com
Jennifer Gamboa, jgamboa@bodydynamicsinc.com

Hip Labral Tears

I first became interested in studying labral tears of the hip as a PT student, when the topic was assigned to me for a research paper at the end of PT school. Having always had an interest in working with dancers, I was surprised to discover, during the course of my research, that acetabular labral tears are often caused by cumulative microtrauma as a result of excessive hip flexion, hip extension with external rotation, or frequent squatting. Think about how often these motions are performed in gymnastics, ballet, figure skating, modern and contemporary dance, African rhythms, and hip-hop.

In some cases, hip labral tears remain unsymptomatic and undiagnosed. In several cadaver studies, 93-96% of cadavers aged 48-102 years demonstrated labral tears. However, it is estimated that labral tears account for 55-90% of complaints of hip pain and 22% of complaints of groin pain in athletic populations. Think about how often

performing artists in your own practice have complained of a groin strain that seems to have persisted well beyond the normal healing time of a muscular injury. My hope is that this month's citation blast will help you recognize the signs and symptoms of acetabular labral lesions, know when to refer, and rehabilitate these injuries effectively, whether it be conservatively or post-operatively.

Lauren Plum, PT, DPT
OSF St. Anthony Outpatient Rehabilitation
Rockford, IL

I have included several seminal review articles that may assist clinician and patient alike in understanding the anatomy and mechanisms of injury surrounding labral tears of the hip. Many entry-level clinicians may not have had significant exposure to labral pathologies in school.

Charbonnier C, Kolo FC, Duthon VB, Magnenat-Thalmann N, Becker CD, Hoffmeyer P, Menetrey J (2011). Assessment of congruence and impingement of the hip joint in professional ballet dancers: a motion capture study. Am J Sports Med.;39(3):557-66.

BACKGROUND: Early hip osteoarthritis in dancers could be explained by femoroacetabular impingements. However, there is a lack of validated noninvasive methods and dynamic studies to ascertain impingement during motion. Moreover, it is unknown whether the femoral head and acetabulum are congruent in typical dancing positions. HYPOTHESIS: The practice of some dancing movements could cause a loss of hip joint congruence and recurrent impingements, which could lead to early osteoarthritis. STUDY DESIGN: Descriptive laboratory study. METHODS: Eleven pairs of female dancer's hips were motion captured with an optical tracking system while performing 6 different dancing movements. The resulting computed motions were applied to patient-specific hip joint 3-dimensional models based on magnetic resonance images. While visualizing the dancer's hip in motion, the authors detected impingements using computer-assisted techniques. The range of motion and congruence of the hip joint were also quantified in those 6 recorded dancing movements. RESULTS: The frequency of impingement and subluxation varied with the type of movement. Four dancing movements (développé à la seconde, grand écart facial, grand écart latéral, and grand plié) seem to induce significant stress in the hip joint, according to the observed high frequency of impingement and amount of subluxation. The femoroacetabular translations were high (range, 0.93 to 6.35 mm). For almost all movements, the computed zones of impingement were mainly located in the superior or posterosuperior quadrant of the acetabulum, which was relevant with respect to radiologically diagnosed damaged zones in the labrum. All dancers' hips were morphologically normal. CONCLUSION: Impingements and subluxations are frequently observed in typical ballet movements, causing cartilage hypercompression. These movements should be limited in frequency. CLINICAL RELEVANCE: The present study indicates that some dancing movements could damage the hip joint, which could lead to early osteoarthritis.

Crawford MJ, Dy CJ, Alexander JW, Thompson M, Schroder SJ, Vega CE, Patel RV, Miller AR, McCarthy JC, Lowe WR, Noble PC (2007). The biomechanics of the hip labrum and the stability of the hip. Clin Orthop Relat Res. 465:16-22.

We explored the mechanical factors leading to the formation of labral tears and the effect of these lesions on hip kinematics at the extremes of joint motion. Using a 3D motion analysis system, the stability of six cadaveric hips was measured during loading maneuvers known to impose anterior loads on the joint margin. These measurements were repeated following

venting of the capsule, and after creation of a 15-mm tear in the intact labrum. Compared to the intact hip, 43% and 60% less force was required to distract the femur by 3 mm after venting and creation of a tear. An ER torque of 177 in-lbf in 30 degrees of flexion caused the vented and torn specimens to rotate 1.5 degrees +/- 2.7 degrees and 7.1 degrees +/- 4.7 degrees more than the intact specimen, and the femoral head to displace 1.21 +/- 0.53 mm and 0.67 +/- 0.35 mm, respectively. A breach of the integrity of labral function is shown to lead to decreased femoral stability relative to the acetabulum during extreme ranges of motion.

Lewis CL, Sahrmann SA, et al. (2007). Anterior hip joint force increases with hip extension, decreased gluteal force, or decreased iliopsoas force. J Biomech **40**(16): 3725-3731.
Abnormal or excessive force on the anterior hip joint may cause anterior hip pain, subtle hip instability and a tear of the acetabular labrum. We propose that both the pattern of muscle force and hip joint position can affect the magnitude of anterior joint force and thus possibly lead to excessive force and injury. The purpose of this study was to determine the effect of hip joint position and of weakness of the gluteal and iliopsoas muscles on anterior hip joint force. We used a musculoskeletal model to estimate hip joint forces during simulated prone hip extension and supine hip flexion under four different muscle force conditions and across a range of hip extension and flexion positions. Weakness of specified muscles was simulated by decreasing the modeled maximum force value for the gluteal muscles during hip extension and the iliopsoas muscle during hip flexion. We found that decreased force contribution from the gluteal muscles during hip extension and the iliopsoas muscle during hip flexion resulted in an increase in the anterior hip joint force. The anterior hip joint force was greater when the hip was in extension than when the hip was in flexion. Further studies are warranted to determine if increased utilization of the gluteal muscles during hip extension and of the iliopsoas muscle during hip flexion, and avoidance of hip extension beyond neutral would be beneficial for people with anterior hip pain, subtle hip instability, or an anterior acetabular labral tear.

Lewis CL, Sahrmann SA (2006). Acetabular labral tears. Phys Ther 86(1):110-21.
Anterior hip or groin pain is a common complaint for which people are referred for physical therapy, with the hip region being involved in approximately 5% to 9% of injuries in high school athletes. Although anterior hip pain is known to result from a number of musculoskeletal and systemic pathologies, a tear of the acetabular labrum is a recent addition to the list that is of particular interest to physical therapists. This mechanically induced pathology is thought to result from excessive forces at the hip joint and has been proposed as part of a continuum of hip joint disease that may result in articular cartilage degeneration. Although the number of recent articles in the orthopedic literature identifying acetabular labral tears as a source of hip pain is increasing, labral tears often evade detection, resulting in a long duration of symptoms, greater than 2 years on average, before diagnosis. Studies have shown that 22% of athletes with groin pain and 55% of patients with mechanical hip pain of unknown etiology were found to have a labral tear upon further evaluation. In order to provide the most appropriate intervention for patients with anterior hip or groin pain, physical therapists should be knowledgeable about all of the possible sources and causes of this pain, including a tear of the acetabular labrum and the possible factors contributing to these tears. Therefore, the purpose of this article is to review the anatomy and function of the acetabular labrum and present current concepts on the etiology, clinical characteristics, diagnosis, and treatment of labral tears.

McCarthy J, Noble P, Aluisio FV, et al. (2003). Anatomy, pathologic features, and treatment of acetabular labral tears. Clin Orthop Relat Res 406:38-47.
There is an evolving body of knowledge regarding the acetabular labrum. Labral tears are most frequently anterior and often are associated with sudden twisting or pivoting motions.

High clinical suspicion in association with positive physical findings are fundamental for the clinician to properly determine treatment for the suspected tear. Labral tears, especially those present for years, may contribute to the progression of hip osteoarthritis. Patients at risk include those with developmental dysplasia, those with tears greater than 5 years, and those with associated chondral full-thickness lesions. Chondral injuries may occur in association with a multitude of hip conditions including labral tears, loose bodies, osteonecrosis, slipped capital femoral epiphysis, dysplasia, and degenerative arthritis. Labral tears occurring at the watershed zone may destabilize the adjacent acetabular conditions. Arthroscopic observations support the concept that labral disruption, acetabular chondral lesions, or both frequently are part of a continuum of degenerative joint disease.

The following articles deal specifically with the incidence and prevalence of acetabular labral tears in both pediatric and athletic populations.

Sink EL, Gralla J, Ryba A, Dayton M (2008). Clinical presentation of femoroacetabular impingement in adolescents. J Pediatr Orthop 28(8):806-11.

Femoroacetabular impingement (FAI) is a recently recognized hip disorder resulting from an abnormal morphology of the proximal femur and acetabulum. This morphology results in increased hip contact forces with hip motion, specifically flexion. This may lead to labral-cartilage injury and pain. The purpose of this study is to describe the clinical presentation and diagnosis of FAI as a cause of hip pain in adolescents.Thirty-five patients with FAI as the etiology of chronic hip pain from one institution were reviewed. The common symptoms, physical examination, and radiographic findings were analyzed.The age range was 13 to 18 years. There were 30 girls and 5 boys. All patients complained of anterior groin pain. All patients performed a sport/activity that contributed to the symptoms such as dancing. Patients had decreased flexion and limited internal rotation on physical examination. All patients had a positive impingement test. Fifteen patients (43%) had primarily pincer impingement with a crossover sign or acetabular retroversion. Cam impingement was the primary type in 2 patients (6%). There were findings of cam and pincer in 18 patients (51%). Sixteen of 28 patients had a positive labral tear on magnetic resonance imaging (57%). Femoroacetabular impingement is a cause of hip pain in the adolescent population. The diagnosis can be derived from reproducible history, physical examination, and radiographic findings. It is more common in female adolescents, and pincer type is more prevalent.

Narvani AA, Tsiridis E, Kendall S, Chaudhuri R, Thomas P (2003). A preliminary report on prevalence of acetabular labral tears in sports patients with groin pain. Knee Surg Sports Traumatol Arthrosc 11(6):403-408.

To the best of our knowledge, this prospective study is the first to investigate the prevalence of acetabular labrum tears in athletes presenting with groin pain. Eighteen athletes who presented to our sports clinic with groin pain, underwent clinical assessment and magnetic resonance arthrography (MRa) to detect presence or absence of acetabular labrum tears. Ethical committee approval and informed consent was obtained from each patient. In four out of these eighteen athletes (22%) the MRa demonstrated the presence of acetabular labrum tear. Three of them underwent arthroscopic debridement of their acetabular labrum tears and returned to their sporting activities within 8 months. Clicking sensation of the hip was a sensitive (100%) and specific (85%) clinical symptom to predict labral tears. The internal rotation-flexion-axial compression manoeuvre was sensitive (75%) but not specific (43%). The Thomas test was neither sensitive nor specific. The conclusion of the study is that acetabular labrum tears can be a common cause of groin pain in athletes. Sports clinicians managing athletes with groin pain have to be well aware of the condition.

Kang C, Hwang DS, Cha SM (2009). Acetabular labral tears in patients with sports injury. Clin Orthop Surg 1(4):230-5.

BACKGROUND: We wanted to investigate acetabular labral tears and their correlation with femoroacetabular impingement in patients with sports injury. METHODS: Among 111 patients who were diagnosed with the acetabular labral tears after arthroscopic treatment from January 2004 to December 2007, we selected 41 patients with sports injury. There were 12 cases of Taekwondo injury, 5 of golf injury, 4 of soccer injury, 3 of gymnastics injury, 2 of Hapkido injury, 2 of aerobics injury, 2 of rock-climbing injury, 2 of fitness training injury and 9 of other sports injuries. We checked the subtypes of acetabular labral tears and the accompanying femoroacetabular impingement. For the cases with accompanying femoroacetabular impingement, we investigated the subtypes according to the types of sports, gender and age. At last follow-up, we checked the Harris Hip Score (HHS), the Hip Outcome Score (HOS) sports scale and the percentage of patients who returned to their sports activity. RESULTS: The average age of symptomatic onset was 26 years (range, 12 to 65 years). The ratio of males to females was 29 : 12. An average duration of the hip pain was 17 months (range, 1 to 60 months). The degenerative type of acetabular labral tears was the most prevalent with 32 cases (78%), and there were 9 cases (22%) of the partial tear type. Thirty cases (73%) were accompanied by femoroacetabular impingement. The average age of the 23 cases (56%) of the cam-type was 23 years (range, 12 to 48 years), and it was more likely to occur in men (87%) and for people practicing martial arts such as Taekwondo or Hapkido. An average age of the 5 cases (12%) of the pincer-type was 26 (range, 16 to 43 years), it usually occurred in women (60%) and for non-martial arts such as golf and gymnastics. There were 2 cases of the mixed type (cam + pincer-type). At 27 months follow-up, the HHS was 61 to 92 points, the HOS sports scale increased 43 to 75%, and the rate of returning to sports was 71%. CONCLUSIONS: In spite of the early expression of symptoms and the short duration of the acetabular labral tears, the high rate of degenerative acetabular labral tears in sports patients is likely associated with repetitive injury after the expression of symptoms. Femoroacetabular impingement in sports patients is seemed to be a cause of the early occurrence of acetabular labral tears. Because the possibility of acetabular labral tears is high in femoroacetabular impingement, sports patients may need to undergo early screening for the diagnosis and care of femoroacetabular impingement.

The following articles may assist the performing arts clinician in ruling in or ruling out acetabular labral tears as a cause of hip or groin pain.

Leibold MR, Huijbregts PA, Jensen R (2008). Concurrent criterion-related validity of physical examination tests for hip labral lesions: a systematic review. J Man Manip Ther. 16:E24-E41.

Hip injuries are prevalent, especially within the athletic population. Of the hip injuries in this population, some 18-55% are lesions to the labrum of the hip. Clinical diagnosis of hip labral lesions is difficult because data on prevalence are varied. In addition, data on the prevalence of internal and external risk factors are absent as are data on the correlation of these risk factors with labral lesions, making it difficult to gauge the diagnostic utility. The mechanism of injury is often unknown or not specific to labral lesions. Internal risk factors may remain hidden to physical therapists because in most jurisdictions, ordering imaging tests is not within their scope of practice. Anterior inguinal pain seems highly sensitive for the diagnosis of patients with labral lesions but can hardly be considered specific; data on other pain-related and mechanical symptoms clearly have little diagnostic utility, making these data collected during the patient history almost irrelevant to diagnosis. By way of a comprehensive literature review and narrative and systematic analysis of the methodological quality of the retrieved diagnostic utility studies, this paper aimed to determine a diagnostic physical examination test or test cluster based on current best evidence for the diagnosis of hip labral lesions. Current best evidence indicates that a negative finding for the flexion-adduction-internal rotation test, the flexion-internal rotation test, the impingement provocation test, the flexion-adduction-axial compression test, the Fitzgerald test, or a combination of these tests provides the clinician with the greatest evidence-based confidence that a hip labral lesion is

absent. Currently, research has produced no tests with sufficient specificity to help confidently rule in a diagnosis of hip labral lesion. Suggestions for future research are provided.

Martin RL, Irrgang JJ, Sekiya JK (2008). The diagnostic accuracy of a clinical examination in determining intra-articular hip pain for potential hip arthroscopy candidates. Arthroscopy 24(9):1013-8.

PURPOSE: One purpose of this study was to determine whether signs and symptoms could identify when a majority of the hip pain was originating from intra-articular sources in potential arthroscopic surgery candidates. The second purpose was to quantify pain reduction after an anesthetic intra-articular injection in those with potential labral pathology. METHODS: Subjects with hip pain being evaluated by an orthopaedic surgeon specializing in hip arthroscopy were prospectively enrolled in the study. Clinical examination results were recorded. Sensitivity, specificity, and likelihood ratios were calculated to determine their accuracy in identifying those who would have greater than 50% pain relief from those with 50% pain relief or less. RESULTS: We enrolled 105 subjects in this study. An anesthetic intra-articular injection was performed in 49 potential candidates for arthroscopic surgery (47%). The mean age in these 49 subjects was 42 years (SD, 15 years; range, 18 to 68 years), with 25 men (51%) and 24 women (49%). According to magnetic resonance imaging (MRI) arthrogram, 18 individuals had a definite labral tear, 29 had a possible tear, and 2 had no labral tears. In those with definite tears or possible tears, 39% (n = 7) and 45% (n = 13), respectively, did not achieve a greater than 50% reduction of pain. Groin pain, clicking, pinching pain with sitting, lateral thigh pain, flexion abduction external rotation test, flexion-internal rotation-adduction test, and trochanteric tenderness were not useful in identifying those with greater than 50% pain relief from those with 50% relief or less. CONCLUSIONS: The symptoms and signs investigated in this study did not accurately or consistently identify subjects with primary intra-articular pain sources. Furthermore, candidates for hip arthroscopy with a labral tear identified on MRI arthrogram had varied responses to anesthetic intra-articular injection. Therefore all labral tears identified on MRI arthrogram may not be a major contributor to patients' pain complaints, and medical personnel should look for other causes of pain. LEVEL OF EVIDENCE: Level III, diagnostic study of nonconsecutive patients (without consistently applied gold standard).

Burgess RM, Rushton A, Wright C, Daborn C (2011). The validity and accuracy of clinical diagnostic tests used to detect labral pathology of the hip: a systematic review. Man Ther 16(4):318-326.

Acetabular labral tears are an area of increasing interest to clinicians involved in the diagnosis of musculoskeletal complaints of the hip. This review systematically evaluated the evidence for the diagnostic accuracy and validity of reported symptoms, physical examination and imaging in this complex population. Studies published in English prior to May 2010 were included. One reviewer searched information sources to identify relevant articles. Two reviewers independently assessed studies for inclusion, extracted data and evaluated quality using the Quality Assessment of Diagnostic Studies Tool. Twenty one studies were included. Meta-analysis was limited owing to heterogeneity between studies. Results showed Magnetic Resonance Arthrography to consistently outperform Magnetic Resonance Imaging. Computerised Tomography also showed high accuracy levels for the few studies identified. Studies investigating physical tests were of poor quality demonstrating a need for further research in this area. Symptoms likely to be present in patients presenting with acetabular labral tears were found to be anterior groin pain and mechanical hip symptoms; however, additional good quality studies are needed to consolidate findings.

Feel confident in your ability to recognize and diagnose acetabular labral tears! The following study illustrates that experienced clinicians parallel orthopedic surgeons as diagnosticians.

Springer BA, Gill NW, Freedman BA, Ross AE, Javernick MA, Murphy KP (2009). Acetabular labral tears: diagnostic accuracy of clinical examination by a physical therapist, orthopaedic surgeon, and orthopaedic residents. N Am J Sports Phys Ther 4(1):38-45.

BACKGROUND: Previous studies have shown military physical therapists (PT) to have comparable clinical diagnostic accuracy (CDA) and interobserver agreement to orthopaedic surgeons (OS). However, no studies have examined hip pathology or used intraoperative findings as the reference standard for diagnosis. OBJECTIVE: To compare the CDA of physical examination findings among a PT, an OS, and two surgical orthopaedic residents (ORs) for hip labral tears. METHODS: Thirty-six patients (15 males, 21 females) aged 18-47 (mean + SD, 31.4 + 8.1 years) with 37 symptomatic hips were enrolled in a prospective study and underwent a standardized clinical examination followed by hip arthroscopy. A PT, an OS, and two ORs independently performed history and examinations with the emphasis of diagnosis on the results of six special tests. RESULTS: Thirty-two of 37 individuals (86%) had labral tears to the hip at arthroscopy. Analysis of agreement between clinical diagnosis and intra-operative findings of a labral tear produced a CDA of 85.3% (29/34 correct) for the PT, 84.4% (27/32 correct) for the OS, and 80.0% (24/30 correct) for ORs. No significant difference in CDA occurred in comparing the PT, OS, and ORs. CONCLUSIONS: Using arthroscopy as the reference standard, hip labral tears were clinically suspected with 80-85% accuracy. The clinical diagnostic accuracy of the PT, OS, and ORs was high with no significant difference between examiners. In this study, an experienced PT, an OS, and two ORs demonstrated similarly high diagnostic skills.

Because acetabular labral tears often require surgical management, I have included several articles on expected outcomes following surgery.

Robertson WJ, Kadrmas WR, Kelly BT (2007). Arthroscopic management of labral tears in the hip: a systematic review of the literature. Clin Orthop Relat Res 455:88-92.

Arthroscopic management of labral problems in the hip has become an accepted therapeutic modality in appropriately selected patients. We performed a systematic review of the literature to determine the rate of patient satisfaction that can be expected following acetabular labral débridement. Computerized literature databases were searched from January 1980 to September 2005 to identify relevant articles that met inclusion criteria and had at least 2 years followup. We included patients with symptomatic acetabular labral tears who failed conservative management, were not claiming workers' compensation, and did not have severe arthritis or severe acetabular dysplasia. Following labral débridement this patient population can expect: (1) a patient satisfaction rate of approximately 67% at 3.5 years follow-up; (2) good results by a modified Harris Hip Score in patients who are subjectively satisfied with their outcome; and (3) a complete resolution of mechanical symptoms in nearly 50% of patients with this complaint. Although limited, the current literature supports non workers' compensation patients with isolated labral tears, who lack associated intraarticular abnormality, can receive both symptomatic and functional improvement following arthroscopic labral débridement.

Kamath AF, Componovo R, Baldwin K, Israelite CL, Nelson CL (2009). Hip arthroscopy for labral tears: review of clinical outcomes with 4.8-year mean follow-up. Am J Sports Med 37(9):1721-7.

BACKGROUND: Arthroscopy of the hip joint is a relatively new diagnostic and therapeutic option for labral tears. PURPOSE: More data are needed to characterize the utility and

effectiveness of hip arthroscopy and identify patient-related factors that might predict functional outcome. STUDY DESIGN: Case series; Level of evidence, 4. METHODS: This retrospective study with prospective follow-up examined the clinical outcomes of 52 consecutive patients undergoing hip arthroscopy for labral tears. Outcomes measures included clinical outcome and the modified Harris hip score. Any complications associated with the procedure were recorded. Exclusion criteria included age younger than 18 years or prior ipsilateral hip surgery. RESULTS: Mean patient age was 42 years. Mean follow-up was 4.8 years. Twenty-one patients (40.4%) had a traumatic cause of the labral tears. Eight patients (15.4%) had possible secondary gain issues. Four (7.7%) patients suffered transient nerve palsies; in 1 case, the guide wire broke during initial cannulation. Three patients (5.8%) went on to total hip arthroplasty after hip arthroscopy. On multivariate analysis, left-sided surgery, a higher preoperative activity level, and duration of symptoms greater than 18 months were found to be positive predictors of good or excellent outcomes. Smoking and secondary gain issues were significant negative predictors of good or excellent outcomes. Only prior level of activity was a significant positive predictor of return to activity after surgery. A traumatic cause of the labral tear was a significant negative predictor of return to activity. Chondromalacia and osteoarthritis were not significant predictors of negative outcome. Postoperative modified Harris hip score improved 40% from 56.8 preoperatively to 80.4 ($P < .001$). No cases of patients with secondary gain issues achieved good or excellent outcomes. Overall percentage of good or excellent outcomes was 56%, or 66% when those with secondary gain issues were excluded; 84% of patients were able to return to sports or equivalent level of preoperative recreational activity. Neither preoperative radiographic osteoarthritis nor grade of intraoperative chondromalacia predicted postoperative outcome. CONCLUSION: This series supports the hypothesis that hip arthroscopy provides safe and reliable improvement of labral symptoms in the majority of patients.

Stevens MS, Legay DA, Glazebrook MA, Amirault D 2010. The evidence for hip arthroscopy: grading the current indications. Arthroscopy 26(10):1370-83.

PURPOSE: The purpose of this systematic review is to provide a comprehensive analysis of the Level of Evidence and the Grade of Recommendation for hip arthroscopy. METHODS: A literature review was performed (in June 2010) using the PubMed and Cochrane databases. Studies that focused on the efficacy of hip arthroscopy for all therapeutic indications were reviewed to determine their Level of Evidence. The studies were grouped based on indication, and the literature supporting each indication was analyzed and assigned a Grade of Recommendation. A subscale proposed by us was used to further describe the evidence base for indications receiving a Grade of Recommendation indicating poor-quality evidence. RESULTS: Fair evidence (grade B) exists to support the surgical technique of hip arthroscopy for the treatment of femoroacetabular impingement. Poor-quality evidence (grade C(f)) exists to support a recommendation for the use of hip arthroscopy in the treatment of acetabular labral tears, extra-articular lesions, septic arthritis, and loose bodies. There is poor-quality conflicting evidence (C(c)) regarding the use of hip arthroscopy for the treatment of mild to moderate osteoarthritis of the hip. CONCLUSIONS: Although fair evidence (grade B) exists to support the use of hip arthroscopy for the treatment of femoroacetabular impingement, a majority of recognized indications for this surgical technique currently lack adequate evidence-based support in the literature (grade C or grade I). Higher-quality trials (Level I and Level II) are needed to provide support for the increasing application of this surgical technique. We also applied a new subscale to the grades of recommendation for summaries or reviews of orthopaedic surgical studies proposed by Wright et al. to provide a description of the direction in which outcomes are trending in Level IV studies. LEVEL OF EVIDENCE: Level IV, systematic review.

Philippon MJ, Weiss DR, Kuppersmith DA, Briggs KK, Hay CJ (2010). Arthroscopic labral repair and treatment of femoroacetabular impingement in professional hockey players. Am J Sports Med 38(1):99-104.

BACKGROUND: Hip injuries are common among professional hockey players in the National Hockey League (NHL). HYPOTHESIS: Professional hockey players will return to a high level of function and ice hockey after arthroscopic labral repair and treatment of femoroacetabular impingement. STUDY DESIGN: Case series; Level of evidence, 4. METHODS: Twenty-eight professional hockey players (NHL) were unable to perform at the professional level due to unremitting and debilitating hip pain. Players underwent arthroscopic labral repair and were treated for femoroacetabular impingement from March 2005 to December 2007. Players who had bilateral hip symptoms were excluded. Athletes completed the Modified Harris Hip Score preoperatively and postoperatively and also completed a patient satisfaction questionnaire postoperatively. Return to sport was defined as the player resuming skating for training or participation in the sport of ice hockey. RESULTS: The average age at the time of surgery was 27 years (range, 18-37). There were 11 left hips and 17 right hips. Player positions included 9 defensemen, 12 offensive players, and 7 goaltenders. All players had labral lesions that required repair. In addition, all patients had evidence of femoroacetabular impingement at the time of surgery. The average time to return to skating/hockey drills was 3.4 months. The average time to follow-up was 24 months (range, 12-42). The Modified Harris Hip Score improved from 70 (range, 57-100) preoperatively to an average of 95 (range, 74-100) at follow-up. The median patient satisfaction was 10 (range, 5-10). Two players had reinjury and required additional hip arthroscopy. CONCLUSION: Treatment of femoroacetabular impingement and labral lesions in professional hockey players resulted in successful outcomes, with high patient satisfaction and prompt return to sport.

This case series, published in May 2011, is the first of its kind to explore conservative treatment options for acetabular labral tears.

Yazbek PM, Ovanessian V, Martin RL, Fukuda TY (2011). Nonsurgical treatment of acetabular labral tears: a case study. J Orthop Sporths Phys Ther 41(5):346-53.

STUDY DESIGN: Case series. BACKGROUND: While the literature has emphasized surgical treatment of acetabular labrum tears, there is a lack of information regarding conservative treatment. The purpose of this case series was to describe a nonsurgical program for those with clinical evidence of an acetabular labrum tear, that emphasized hip and lumbopelvic stabilization, correction of hip muscle imbalance, biomechanical control, and sport-specific functional progression. CASE DESCRIPTION: The 4 patients in this series had clinical evidence and magnetic resonance imaging confirmation of an acetabular labrum tear and underwent a similar treatment protocol consisting of 3 phases. Phase 1 emphasized pain control, education in trunk stabilization, and correction of abnormal joint movement. Phase 2 focused on muscular strengthening, recovery of normal range of motion (ROM), and initiation of sensory motor training. And phase 3 emphasized advanced sensory motor training, with sport-specific functional progression. ROM, flexibility, pain, special tests, and level of function were assessed, and strength was measured with handheld dynamometry. OUTCOMES: All patients demonstrated decreased pain, functional improvement, and correction of muscular imbalance. Increased muscle strength, primarily for the hip flexors (1%-39%), abductors (18%-56%), and extensors (68%-139%) was also noted. DISCUSSION: All patients responded well to our program. This case series suggests that patients with clinical evidence of an acetabular labral tear confirmed with MRI can show meaningful improvement with nonsurgical intervention. LEVEL OF EVIDENCE: Therapy, level 4.

Because of the rising demand for evidence-based outcome measures in rehabilitation, I have included the following article.

Lodhia P, Slobogean GP, Noonan VK, Gilbart MK (2011). Patient-reported outcome instruments for femoroacetabular impingement and hip labral pathology: a systematic review of the clinimetric evidence. Arthroscopy 27(2):279-86.

PURPOSE: The purpose of this study is to systematically review the content and clinimetric evidence (rigor of rating scales and indexes for the description of clinical phenomena) of published patient-reported outcome (PRO) instruments used to assess femoroacetabular impingement (FAI) and labral hip pathology. METHODS: We used Medical Subject Heading terms related to FAI and labrum/labral tears to search the Medline, Embase, and Cochrane databases for studies of FAI and labral hip pathology. Studies with hip-related PRO instruments, with any operative intervention except total hip arthroplasty, were included. We excluded studies with a skeletally immature population, revision surgeries in more than 10% of cases, or a primary diagnosis of hip osteoarthritis. We conducted a second review using the same databases for studies reporting clinimetric properties of at least 1 of the PRO instruments identified previously. Articles were selected in an independent, stepwise manner by 2 reviewers. Selected articles were evaluated to determine the presence and quality of measurement properties of the outcome instruments. RESULTS: We found 5 articles assessing 3 PRO instruments: the Hip Outcome Score (HOS), the Non-Arthritic Hip Score, and the 12-item modified Western Ontario and McMaster Universities Osteoarthritis Index. The HOS had the highest positive rating for internal consistency, construct validity, agreement, responsiveness, lack of floor/ceiling effect, and interpretability. The Non-Arthritic Hip Score showed evidence for validity and lack of floor/ceiling effect. The modified Western Ontario and McMaster Universities Osteoarthritis Index was only strong for internal consistency and was indeterminate for construct validity. CONCLUSIONS: Only 3 PRO instruments have shown clinimetric evidence to support their use to measure outcomes in FAI and labral pathology patients. The HOS has the greatest amount of clinimetric evidence and is the most proven instrument for use in this population. This review shows that further clinimetric evaluation of commonly used PRO instruments for nonarthritic hip pathology is warranted.