BRIGHAM AND WOMEN'S HOSPITAL

Department of Rehabilitation Services
Physical Therapy

Standard of Care: Acetabular Labral Tears Non-Operative Treatment

Case Type / Diagnosis: Acetabular Labral Tear

ICD 10 Codes:

S73.191D	**Tear of acetabulum labrum, right, subsequent encounter primary**
S73.192D	**Tear of acetabulum labrum, left, subsequent encounter primary**
M16.9	**Labral tear of hip, degenerative**
M76.891	**Enthesopathy of hip, right**
M76.892	**Enthesopathy of hip, left**
M25.551	**Hip pain, right**
M25.552	**Hip pain, left**
M25.551	**Pain in joint, pelvic region and thigh, right**
M25.551	**Pain in joint, pelvic region and thigh, left**
M76.891	**Femoroacetabular Impingement, right**
M76.892	**Femoroacetabular Impingement, right**

Preferred Therapy Practice Pattern(s)
Musculoskeletal - impaired joint mobility, motor function, muscle performance, and range of motion associated with connective tissue dysfunction

The acetabular labrum (labrum) is a structure akin to the meniscus of the knee and the glenoid labrum of the shoulder[1]. The labrum is a 2-3 mm thick fibrocartilaginous structure, which covers the rim of the acetabulum and serves multiple functions including: stability, joint integrity, and lubrication.[2] It enhances stability by structurally deepening the acetabulum. A fluid seal is created by the labrum which contains the synovial fluid within the articular cartilage and maintains lubrication[3]. The labrum decreases force distribution at the hip joint by preventing direct contact between the femoral head and the acetabulum.[2,4] A study by Ferguson that analyzed the difference in joint stress without a labrum suggested the hip contact stress increases by 92%[3]. The labrum can be torn secondary to high forces at the hip joint, which can lead to joint instability with consequent labral fraying as well as chondral degeneration.[4,5] The labrum also provides proprioceptive feedback through free nerve endings which, in a pathological joint, can be a source of pain[6,7]. The most innervated areas throughout the labrum are the anterior and superior portions[2]. The obturator, superior gluteal, and inferior gluteal arteries consist of the vascular supply to the labrum which is mostly peripheral in distribution.[2]

Prevalence of labral tears:

A 2009 comprehensive review of hip labral tears by Groh and Herrera states that prevalence of labral tears in those patients with groin or hip pain is 22-55%.[2] This same review suggests that labral tears were found more often in younger patients, rather than labral tears in addition to

chondral degeneration that was found in older adult population. This evidence possibly suggests labral tears may lead to chondral degeneration[2]. Narvani et al found that up to 20% of athletes presenting with groin pain are found to have a symptomatic labral tear.[8] Correlation between age and the prevalence of labral tears has been noted.[2]

Labral tears are reported more often in females than in males. This may be due to the fact that females are more likely to have hip dysplasia.[9,10] Studies conducted in Japan revealed that posterior labral tears were more common than in studies conducted in Europe and in the United States.[3] It is suspected that the sitting on the ground and squatting positions in Japanese culture may put more stress on the posterior aspect of the hip.[4] However Martin and Katz suggest that most tears occur in the anterosuperior labrum.[1]

Possible reasons for prevalence of anterior tears include:

- Less blood supply to anterior region of labrum resulting in decreased potential for repair.[4]
- Anterior labrum tissue is mechanically weak due to presence of loose, irregularly arranged connective tissue.[4]
- A region that is subject to high forces due to the anterior orientation of both the femoral head and acetabulum with decreased bony constraint anteriorly; the stability of that region therefore comes from the labrum, joint capsule and ligaments.[4]
- The labrum is anatomically thinner anteriorly compared to posteriorly.[2]

The most common mechanism of injury is an external rotation force while the hip is hyperextended. However, there may not have been a traumatic event, but rather repetitive microtrauma associated with repeated twisting and pivoting[3]. Groh and Herrera indicate that up to 74% of labral tears are insidious in nature and cannot be linked to a specific event.[2]

Etiology of labral tears*:*

It is estimated that 90% of patients with labral pathology have underlying structural abnormalities in femoral and/or acetabular morphology.[9]

Traumatic injuries

The labrum is susceptible to traumatic injury from shearing forces in weight-bearing. Direct trauma to the hip, including motor vehicle accidents, slipping or falling without hip dislocation are common causes of labral tears. Sports in which there is repetitive hip external rotation, such as in ballet, soccer, hockey, and golf have also been known to cause labral tears. In addition, end range motions of hip hyperabduction, hyperextension, hyperflexion and external rotation are correlated with increased incidence of labral tears as it is hypothesized that the labrum assumes a weight bearing role in these end range positions.[4] Despite these known causes of labral tears, up to 74.1% are not associated with any specific event or cause, usually presenting with an insidious onset and mechanism of injury hypothesized as microtrauma.[2]

Femoral Acetabular Impingement (FAI)

FAI is described as decreased joint clearance between the femur and acetabulum which can cause impaired ROM at the hip and damage to the articular cartilage.[2] There are 2 types of FAI:

Cam Impingement: Occurs when the femoral head has an unusually large radius (non-spherical), causing abnormal contact between the femoral head and acetabulum, especially with active motions of hip flexion combined with adduction and internal rotation. This impairment in joint mechanics leads to anterosuperior labral and chondral lesions.[4,5] Cam type impingement occurs twice as commonly in males as females.[11]

Pincer impingement: Occurs when an abnormally shaped acetabulum creates an over-coverage onto the femoral head. This over coverage can be general (deep acetabulum) or anterior (acetabular retroversion). This impairment in joint mechanics causes posteroinferior chondral lesions.[5]

Pincer impingement is typically more common in middle-aged female athletes, whereas cam impingement is more common in young athletic males[5]. However, a joint can also have both types of these above listed impingements[1]. Patients with FAI may have pain that is in the area of the groin and lateral thigh that is at times referred to as the "C-sign"; as the patient may put their thumb around the posterior hip and fingers into the anterior thigh/groin when describing their pain.[1]

Laxity/hypermobility

Capsular laxity can be caused by injury, collagen disorders, hormonal influences to the underlying tissues as well as repetitive motions that can weaken part of the capsule resulting in instability and increased force distribution on certain parts of the labrum (Appendix A).[5]

Degeneration

Degeneration is found to be correlated with older individuals. Cadaver studies have demonstrated that 93-96% of adult hips show evidence of labral tears and abnormalities.[5]

Chondral Lesions

Labral tears have been found to result in degenerative changes to the acetabular articular surface. McCarthy reported that 73% of patients with labral pathology have chondral damage, damage being more severe in those with disrupted, torn labrums.[11] In 94% of these patients, the labral lesion was found to occur in the same zone as the articular damage.[2]

Dysplasia

Dysplasia is defined as a shallow acetabular socket and results in decreased coverage of the femur anteriorly and laterally, compromising the stability of the joint. This can lead to joint hypermobility and compression of the labrum, resulting in tears most often occurring at the anterior labrum.[5]

Predisposing Factors:

Modifiable Factors

Include: Impairments of muscle length, muscle performance, joint mobility, posture, and neuromuscular control. Janda describes the lower crossed syndrome, which is a pattern of muscle imbalances that could possibly increase risk for labral tear. This pattern of muscle imbalance is described by tightness of the hip flexors and erector spinae as well as weakness of the gluteal and abdominal musculature. All which can cause increased anterior pelvic tilt and hyper-lordosis of

the lumbar spine in combination with hip flexion contracture, which collectively can increase forces on the anterior labrum and corresponding acetabulum.[2]

Non-Modifiable Factors
Non-modifiable factors include abnormal boney hip morphology which may limit internal and external rotation of the hip causing repetitive trauma, hypermobility, and connective tissue laxity.[1]

Symptoms/Clinical Presentation:

Common symptoms associated with a labral tear include pain, clicking, locking, instability, catching, giving way and/or stiffness. Symptoms usual worsen with squatting, pivoting, and are unable to be alleviated with rest.[2] Intra-articular hip pathologies can refer pain to the anterior groin, buttock, greater trochanter, thigh and/or medial knee.[12] 90% of patients with a labral tear complain of hip and/or groin pain. Besides anterior groin and hip pain, clicking is one of the most common symptoms associated with acetabular labral tears.[2] Typically, patients report a long duration of symptoms, averaging 2 years.[13] This may be due in part to the fact that it remains difficult to recognize labral tears as the source of hip pain.

Medical Imaging/Radiographic diagnosis:
Due to improvements in technology with MRI and arthroscopic techniques, labral tears are now being diagnosed more frequently.[2] MRI's produce both false-positive results and an underestimation of labral pathology and has only a 30% sensitivity and a 36% accuracy. MRI arthrography produces better results, with reported specificity of about 91%.[14] Direct observation of the labrum by arthroscopy continues to be the gold standard for diagnosis.[3]

Common symptoms and clinical examination findings associated with intra-articular and extra-articular sources of pain[5]

Intra-articular pathology: (labral tears, chondral lesions, osteoarthritis, synovitis, loose bodies, avascular necrosis and/or inflammatory arthritis).

Common Symptoms:
Groin pain
Clicking, catching, locking, giving way

Clinical Examination:
Groin pain/limited range of motion with FABER test[15]
Groin pain and/or clicking with Hip Scour test[15]
Groin pain with straight leg raise test[8]
Groin pain and/or clicking with FADIR test/Anterior Labral test[20]
Groin pain/clicking with Anterior Labral test [20]
Groin pain/clicking with Posterior Labral test [20]

Femoral Acetabular Impingement:
Common Symptoms:
Anterior pinching pain with sitting

Clinical Examination:
Anterior pinching pain with the impingement test[19]

Degenerative Changes:
Common Symptoms:
Medial thigh pain
Morning stiffness

Clinical Examination:
Painful and/or limited internal rotation ROM
Limited flexion ROM

Capsular Laxity:
Common Symptoms:
Instability

Clinical Examination:
General hypermobility with Beighton's scale[16] (see Appendix)
Increased external rotation ROM with the Log Roll test[17] (see Appendix)
Increased motion and/or apprehension with long-axis femoral distraction

Indications for Treatment:
Indications for treatment include pain, loss of function, and mobility impairments.

Contraindications / Precautions for Treatment:
Acute hip pain with fever, malaise, night sweats, weight loss, and night pain may be indicative of tumor, infection, septic arthritis, osteomyelitis or an inflammatory condition.[2] A fracture may be present if there is a history of traumatic injury, pain with weight-bearing and inability to walk, and pain in all planes of motion. A history of corticosteroid use and alcohol abuse may put a patient at risk of developing avascular necrosis.[2]

Evaluation:
Medical History: Review past medical history (PMH), pertinent diagnostic tests, imaging and workup, physicians' notes in medical record (EPIC).

History of Present Illness: Chief complaint or mechanism of injury, date of injury, duration of symptoms, treatment to date, reason for referral, prior level of function, current functional limitations, previous physical therapy, and past or current use of orthotics. Also inquire about patient's own goals.

Social History: Family/social support, employment, physical activity level, hobbies, sports, ADL's and any pertinent functional limitations.

Medications: Note relevant medications including NSAIDS, muscle relaxants and other analgesics.

Examination:

Note: This section is intended to capture the most commonly used assessment tools for this case type/diagnosis. It is not intended to be either inclusive or exclusive of assessment tools.

Differential Diagnosis: Lumbar disc disease, hip osteoarthritis, osteomyelitis, fracture, avascular necrosis, chondral lesions, congenital disorders, tumor, hernia, SI joint pathology, bursitis (trochanteric, ischiogluteal, iliopsoas), iliotibial band syndrome, piriformis syndrome, iliopsoas tendonitis, synovitis and systemic disease such as rheumatoid arthritis and systemic lupus erythematosus.[1,2]

Observation:

Globally assess for:

- Postural asymmetry
- Pelvic asymmetry (ASIS, PSIS, Iliac Crest, Sacral torsions)
- Excessive lordosis
- Weight bearing intolerance on affected lower extremity
- Excessive external rotation of hip or lower extremity
- Impaired single limb stance right versus left
- Patient's functional mobility during transfers and bed mobility
- Leg length discrepancy
- Altered foot biomechanics/shoe wear

Recent research has demonstrated an increase in hip joint force in both supine hip flexion and prone hip extension when the agonist muscles are inefficient and therefore weak.[3] Additionally, the researchers indicate that imbalances in the musculoskeletal system can all lead to increased joint forces at the hip.[3] Therefore, observing the patient's alignment and quality of motions in these positions is essential with lower extremity and trunk observation to analyze particular cause/contributions to anterior hip pain.

- Assessment of standing alignment
- Presence of hip hyperextension as indicated by:
    - Knee hyperextension
    - Posterior pelvic tilt
- Femoral motions and quality of movement accompanying knee extension (in sitting)
- Quality and control of active hip flexion and passive hip flexion
- Pattern of hip extension in prone (assessing participation of hamstring vs. gluteus maximus)
- Effect of passive knee flexion on femoral motion in prone
- Pattern/range hip rotation in prone and sitting
- In quadruped, alignment of hip joint and presence of symptoms while in position and rocking back onto heels

Pain: Typical pattern is chronic, intermittent aching and/or clicking localized over anterior groin. Pain complaints are aggravated with hip rotations in weight-bearing and with combined motions of hip flexion, adduction and internal rotation[3]. Prolonged standing or sitting may provoke and intensify symptoms; walking, running and/or climbing functions will likely be limited.

Palpation: The hip joint is deep and not easily palpable, but surrounding structures may show signs of pathology. The surrounding structures include hip flexors, adductors and abductor muscles, in addition to inguinal ligament and psoas bursa[11]. Directly palpate over greater trochanter, iliac crest, anterior superior iliac spine (ASIS), posterior superior iliac spine (PSIS), ischial tuberosities, sacroiliac, lumbosacral and sacrococcygeal joints[8] explore if other associated areas of hypersensitivity (sciatic nerve, lower back, ITB).

ROM: Active and passive ROM of hip, active and passive ROM of knee joint; active ROM of lumbar spine

Joint Mobility: accessory motion of lumbar spine, ilium, sacrum, hip

Muscle Length: iliacus, psoas, gluteus medius, maximus, piriformis, hamstrings, gastroc-soleus, quadriceps, iliotibial band, tensor fascia lata, quadratus lumborum, lumbar extensors and hip adductors[11].

Strength: hip muscle strength, lumbar spine strength (including lumbar extensors, and multifidi), abdominal muscle strength (strength of transverse abdominis, rectus abdominis (upper/lower), internal/external obliques), plantar flexors, quadriceps, hamstrings.

Sensation: Patient may report numbness or paresthesia-like symptoms in the upper thigh that do not follow any dermatomal segment; if a dermatomal pattern is present, e.g. L 4-5, consider lumbar spine pathology.

Special Tests: Thomas test, leg length measurement, resisted hip abduction, ligamentous stability, passive internal rotation of hip, passive hip adduction, Faber test, Scour test and resisted SLR, neural tension tests[11]. When positive, these last 3 tests (Faber, Scour, and resisted SLR) indicate the presence of intra-articular hip pathologies, not necessarily only labral tears. Anterior hip impingement test may also be positive in those who have labral pathology[1]. Lumbar spine special tests and pelvic girdle special tests should also be completed.

Gait: Note if antalgic, uneven stride length; decreased stance on affected limb; cadence; ask patient to increase speed to brisk walk and note further impairments; note balance and safety with locomotion; assess stair climbing ability. Assess standing balance with single limb stance. Patient may walk with hip in external rotation as an improper correction of femoral anteversion.[3] Note use of assistive device, shoe lift, or orthotics.

Functional Outcomes: A validated outcome measure that best captures the functional status and outcomes of patients with labral tears should be utilized**.** The Hip Outcome Score (HOS) is a self-report measurement tool that consists of an ADL and sports subscale. The HOS was developed specifically for patients with labral tears. The HOS subscales have high test-retest

reliability (intraclass correlation coefficient [ICC] = 0.98 and 0.92 for the ADL and sports subscales, respectively). The minimal detectable change (MDC) is an increase or decrease of 3 points, and the minimal clinically important difference is 9 points on the ADL subscale and 6 points on the sports subscale.[18] Alternatively, a more general lower extremity measure such as the Lower Extremity Functional Scale (LEFS) can be utilized.

Assessment:

Establish lumbo-pelvic-hip differential diagnosis and need for skilled physical therapy services. Need to differentiate the components of the lumbar spine, the pelvic girdle and the hip as inter-related components of the hip pain as indicated.

Problem List: The problem list is derived from the identified problems, dysfunctions and indication for treatment.

Potential Impairments:

- Pain
- Decreased ROM
- Decreased muscle strength
- Impaired neuromuscular control
- Decreased muscle length
- Posture dysfunction
- Impaired joint mobility
- Impaired muscle performance
- Impaired gait
- Joint mobility
- Limited function (see subjective portion of examination)
- Knowledge deficit regarding condition, self-management, home program, prevention

Prognosis: Other than in the presence of trauma, labral tears often remain undetected for long periods of time.[3] Surgical interventions have been proven effective for short-term management of pain and decreased function, but the long-term outcomes remain unknown.[3] The role of physical therapy in these cases is to increase function and decrease pain, evaluate and treat associated impairments and educate the patient on strategies to increase function.

Goals:

1. Independent self-management of pain, posture, joint protection and body mechanics
2. Decrease pain to 0/10 per VAS score
3. Increase ROM to WNL for pelvis, lumbar spine and hip
4. Normal muscle length throughout the lower extremities
5. Increase strength to normal for trunk and bilateral lower extremities
6. Improve gait efficiency and quality
7. Pain-free function and return to previously active lifestyle
8. Independence with home exercise program, joint protection strategies, activity modulation and self-management of condition

Age Specific Considerations: Some studies suggest that labral abnormalities occur naturally with aging, whereas other studies associate labral tears with joint pathology and pain.[1] However, the reported age range of people with hip pain and labral tears is from 8 to 75 years.

Treatment Planning / Interventions

Established Pathway	___ Yes, see attached	_X_ No
Established Protocol	__ Yes, see attached	_X_ No

Interventions most commonly used for this case type/diagnosis:

This section is intended to capture the most commonly used interventions for this case type/diagnosis. It is not intended to be either inclusive or exclusive of appropriate interventions.

There is a paucity of evidence in the literature regarding conservative physical therapy treatment for acetabular labral tears. In a 2011 systematic review Orbell and Smith concluded that debate remains whether physical therapy treatment is effective for patients with labral tears and indicate further research is needed to verify the efficacy of PT treatment for labral tear.[21] A 2012 study by Hunt and Prather of conservative vs. surgical treatment for pre-arthritic hip disorders (including labral tears, FAI, dysplasia) found all subjects with signs and symptoms of pre-arthritic, intra-articular hip disorders who were treated with conservative treatment alone and with conservative treatment followed by surgery demonstrated significant improvement in pain and functioning from baseline to 1 year. Forty-four percent of patients improved with conservative care alone, and 56% chose to have surgery after receiving conservative care.[24] Lewis and Sahrmann[3] suggest that physical therapy can in fact be beneficial when used appropriately. They suggest that the physical therapy intervention should focus on decreasing anteriorly directed forces on the hip by correcting muscle imbalances and faulty movement patterns. Patients should also be educated in avoiding pivoting motions in which the acetabulum rotates on the femur, especially in a loaded position. A limited number of case series have been published in recent years. Yazbek et al published a case series of 4 patients who were treated conservatively and found that all patients demonstrated improved strength, improved function, and decreased pain at 6 months.[23]

Interventions most commonly used for this case type/diagnosis. (See Appendix B)

1. Therapeutic exercises for pelvis and lower extremity, especially strengthening deep external hip rotators, core stabilization
2. Gait training for efficient and effective pattern; correct any deviations and compensations, especially knee hyperextension, which causes hip hyperextension during stance phase. Focus on adequate push-off to minimize anterior hip joint forces[1]
3. Consider assistive device as appropriate
4. Orthotic consultation / heel lift as appropriate
5. Instruction in home exercise program
6. Low impact conditioning exercise such as recreational exercises and aquatic therapy
7. Manual therapy, including joint glides and long axis distraction

Frequency & Duration:
The frequency and duration of follow up treatment sessions will be individualized based on the specific impairments and functional limitations with which the patient presents during the initial evaluation. On average, the frequency may range from 1-2 times per week for 4-12 weeks.

Patient / family education:

1. Joint protection techniques
2. Proper use of assistive device
3. Patient education
4. Posture
5. Positioning
6. Home exercise program
7. Pain self-management

Recommendations and referrals to other providers as indicated.

1. Orthopedist
2. Orthotist
3. Physiatrist
4. Primary Care Physician (PCP)
5. Pain Management Clinic

Re-evaluation

Reassessment should be completed every thirty days in the outpatient setting unless warranted sooner. Possible triggers for an earlier reassessment include a significant change in status or symptoms, new trauma, plateau in progress, and/or failure to respond to therapy.

Discharge Planning

Commonly expected outcomes at discharge: Patient will have met goals with focus on self-management of symptoms, and exercise and activity modification and progression.

Transfer of Care (if applicable): If no improvement or progress towards goals, return to referring physician for further medical management.

Patient's discharge instructions: Exercise guidelines, education regarding symptom management and activity modification, home exercise program, postural correction, self-management of symptoms. Follow up with referring physician as needed.

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APPENDIX A

Joint Hypermobility:

The Beighton Hypermobility Score[16] is used to assess hypermobility of peripheral joints and of the spine. It constitutes four maneuvers, which should be performed bilaterally for the first three.

1. Extend the 5th MCP joint more than 90 degrees, oppose the thumb to the forearm.
2. Extend the elbow more than 10 degrees beyond neutral (0 degrees)
3. Extend the knee 10 degrees beyond vertical (0 degrees)
4. Place both palms on floor without bending knees

One point is awarded for the ability to perform each of four maneuvers, with the first three being performed bilaterally, for a total of 9 points. A Beighton score of >/ 4 is considered indicative of generalized hypermobility.

Roll Test:[17]

With patient lying in the supine position, the examiner rolls the hip of the affected extremity into external and internal rotation. This test should invoke guarding or spasm, especially with internal rotation.

BRIGHAM AND WOMEN'S HOSPITAL

APPENDIX B-

Non-Operative Physical Therapy Intervention: Acetabular Labral Tears

Please utilize the following progressions to the next phase based on Clinical Criteria and/or Time Frames as Appropriate.
The intent of the treatment progression is to provide the clinician with a guideline for the rehabilitation course of a patient with a labral tear to be treated non-operatively. It is by no means exhaustive or to be used as a substitute for one's clinical decision making regarding the progression of a patient based on their physical exam/findings and individual progress.

Phase I – (Day 1 (PT evaluation)-Week 0-2):
GOALS

- Provide patient with understanding of etiology
- Patient education of home exercises
- Compliance with self-care, home management, activity modification
- Normalize gait
- Restore ROM
- Restore joint mechanics of lumbar spine, pelvis and hip
- Restore pelvic alignment
- Initiate strengthening
- Minimize pain at rest
- Minimize pain with ambulation and function (consider assistive device for pain relief and normalize gait pattern)

PRECAUTIONS/GUIDELINES

- Avoid symptom provocation during ambulation, activities of daily living (ADL), therapeutic exercise
- No active hip flexion with long lever arm, e.g. No SLR

TREATMENT STRATEGIES

- Home exercise program, as instructed;
    - abdominal setting (focus on Transverse Abdominus), gluteal setting if permitted, quadriceps setting pain free, plantar flexion and eversion with elastic bands, all pain free
    - ROM
        - Restore Pain-free P/AROM all directions
            - Lumbar Spine
            - Ilium
            - Hip
        - Restore Pelvic Alignment

        - Joint glides and mobilization with movement for joint capsule restrictions
- Patient education
    - Activity modification
    - Bed mobility
    - Positioning
    - Shoe wear
    - Assistive device as indicated for ambulation
- Soft tissue techniques to address iliacus, psoas, piriformis, TFL, ITB, gluteal muscles, superior/proximal rectus femoris
- Pelvic alignment techniques (muscle energy techniques, Joint Mobilization, STM)
- Gait training
- Hydrotherapy/Pool Aquatics
    - Gait-backward walking
    - Pain-free active range of motion
    - Single-leg standing
- Open chain strengthening for knee flexion, hip abduction hip extension to neutral, gastrocnemius
- Initiate core control: Transversus abdominus isometrics
- Balance training: double-limb support

CRITERIA FOR ADVANCEMENT

- Control of pain
- Symmetrical pelvic alignment
- Normalized gait with appropriate assistive device

Phase II –Strengthening (Weeks 2-12):

GOALS

- Normalize gait- no pain nor deviations with or without assistive device
- 0/10 pain during ADL
- Ascend/descend 8-inch step with good control, with or without rail/assistive device
- Core control during low demand exercises
- Good pelvic stability to meet demands of ADL
- Continued Symmetrical pelvic alignment
- ROM Lumbar spine and hip within functional limits
- Patient education and independence with home therapeutic exercise program

PRECAUTIONS

- Antalgic gait
- Symptom provocation
- Pain during ADL
- Pain during therapeutic exercise: hip abduction and flexion to tolerance
- Faulty movement patterns of hip, pelvis, lumbar spine
- Impaired posture
- Capsular and soft tissue irritation
- No active SLR nor hip flexion exercises until pain subsides

TREATMENT STRATEGIES

- Manual therapy as indicated for lumbo-pelvic-hip impairments e.g. STM, joint mobilization, joint manipulation, MET, kinesiotaping
- Postural reeducation to control neutral pelvis, utilization of TrA with function
- Home exercise program, as instructed, based on evaluation and progression
- Hydrotherapy: buoyancy assisting to buoyancy resisting exercises
- Hip strengthening progression
    - hip extension to neutral (gluteus maximus with or without hamstrings)
    - hip abduction pain-free and in neutral spine to isolate gluteus medius (no hip flexion)
    - clam shell with hip in neutral (0 degrees) with knee flexion
    - knee flexion to neutral (hamstrings)
    - leg press to 45-60 degrees (gradually increasing weight)
    - *no lunges, no full squats
- Functional strengthening: leg press, mini functional squats (for functional activities, not repetitive exercise), step-ups/step-downs, foam, balance boards, functional and sport specific training
- Hip ROM with stable pelvis
    - Quadruped rocking backward (hip flexion)
    - Heel slides (hip flexion to 90)
- Core control progression
- Bicycle, seat elevated, pain-free, progress from no resistance to min/mod resistance pain-free, elliptical more backwards than forward and pain-free
- Proprioception and balance exercises: progress from double-limb to single-limb support
- Flexibility: evaluation-based
- Modalities for pain control: TENS, Kinesiotaping, Ice, Cold Pack

CRITERIA FOR ADVANCEMENT

- ROM within functional limits
- Ascend/descend 8-inch step with good pelvic control
- Good pelvic control during single-limb stance
- Normalized gait without an assistive device
- No Active Hip Flexion until pain subsides

Phase III–Advanced Strengthening/Return to High Level Function/Sports (Weeks 12-24):

GOALS

- Independent advanced home exercise program
- Optimize ROM
- 5/5 LE strength, 4/5 trunk strength
- Good, dynamic balance
- Pain-free ADL
- Pain-free hip flexion
- Return to low impact recreation activities/sports

PRECAUTIONS

- Symptom provocation
- Ignoring functional progression
- Return to sport pain-free

- Sacrificing quality for quantity
- No lunges, no deep hip/knee squats

TREATMENT STRATEGIES

- Home exercise program, as instructed: evaluation-based to incorporate treatment strategies
- Instruction of ROM (surgeon guidelines, time frame)
- Demonstration of moderate level core exercises
    - Quadruped extremity lifts with or without weights
    - Full plank and side plank up to 2 minutes
    - UE Diagonal patterns on Bosu with weights, double leg to single leg
- Cross-training: elliptical trainer, bicycle, stair stepper, backwards more than forward or at least equal long term, all pain-free during and after
- Initiate gym routine to include hip strengthening machines and backward progression of functional training with qluteus maximus and gluteus medius and back extensors as tolerated
- Initiate plyometrics pain-free and as needed

CRITERIA FOR RETURN TO SPORT

- Gluteal strength and core trunk strength to maintain pelvic control during sport specific or functional activities
- 0/10 pain with advanced activities
- Normal ROM
- Normal Strength
- Symmetrical Pelvic Alignment