



Departments of Rehabilitation Services and Orthopaedic Surgery

Post-operative Rehabilitation Protocol following Arthroscopic Hip Surgery for Femoroacetabular Impingement

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Hip preservation surgery has become an increasingly common procedure to address a number of intra-articular hip disorders including labral tears and femoroacetabular impingement. The number of hip arthroscopies has increased greatly in the past decade. With this increase in number of surgeries have come advancements and refinements in surgical techniques and increasingly complex considerations for rehabilitation needs. Hip arthroscopies with labral repair and FAI correction are typically a successful procedure with improvements in function (mHHS) and pain (VAS) typically seen in patients at 3, 6, and 12 months.¹

This rehabilitation protocol has been written with consideration of current surgical techniques and avoidance of post-operative complications. Proper rehabilitation to avoid post-operative adhesions, and appropriate weight bearing, along with manual therapy to manage post-operative impairments are all important factors to consider in order to minimize the risk of adverse outcomes. The rationale for aspects of this protocol is provided in the following paragraphs to increase clinician knowledge and understanding. Since surgical techniques and procedures can vary for each patient, the clinician should obtain and read the detailed operative report in order to gain a full understanding of what must be considered in the post-operative period.

Consideration for tissue quality, bone quality, success of repair, and surgical technique should be assessed and considered by the clinician. Avoidance of irritation and inflammation in the post-operative phase is imperative. In the first phase of rehabilitation the focus is to protect the repair and avoid irritation. Gluteal isometrics have been shown to be helpful in decreasing iliopsoas spasm and preventing anterior hip pain and are therefore initiated in Phase I of the protocol.²

One surgical technique that merits special consideration in post-operative rehabilitation is capsular closure. Capsular closure is performed to restore the normal anatomy and minimize the risk of post-operative issues with instability. With the capsular repair closure technique, it is necessary to protect and limit hip external rotation and extension in the early healing phase to protect the integrity of the repair.² Capsular integrity has been correlated to improved outcomes after hip arthroscopy with FAI correction.

Additionally, the clinician should consider whether the labrum was repaired or reconstructed. If the labral tissue is inadequate the surgeon may reconstruct the labrum using an autograft or allograft. This information can be accessed in the operative note and will impact rehabilitation.

The evidence for manual therapy after hip arthroscopy is developing. It is thought that manual therapy to the musculature and joints around the hip joint helps to decrease nociceptive input and address impairments that develop in the pre and post-operative period, thereby decreasing abnormal forces to the hip joint and improving patient outcome.³ In order to protect the integrity of the labral repair or reconstruction, capsular repair, and protect the fluid seal, long axis hip distraction should not be performed until 8 weeks after labral repair and 12 weeks after labral reconstruction. Joint mobilizations of grade III-IV should not be performed until 8 weeks postoperatively for the aforementioned reasons.

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Intra-articular adhesions have been recognized as a cause of surgical complications and pain. In an analysis of possible risk factors for adhesions following hip arthroscopy, the following factors were identified: age under 30, Modified Harris Hip score under 50, no microfracture performed, and rehabilitation without circumduction.⁴ Passive range of motion circumduction is incorporated into treatment to minimize the development of post-operative adhesions.

Appropriate progression of weightbearing and gait retraining are essential aspects of rehabilitation. With respect to weightbearing, the patient is initially limited to 20 lb of foot flat weight bearing in the immediate post-operative phase. This limitation is due to the concern for appropriate healing of the labral repair or reconstruction, and the capsular repair. Foot flat weight bearing is indicated to avoid achilles irritation or shortening, irritation or shortening of hip flexors and stressing the labral repair or reconstruction.² Patients should be counseled that they should not self select a non-weightbearing pattern due to increased compressive forces to the hip joint due to hip flexor overactivity.⁵ It is expected that the gluteus medius will be inhibited post-operatively, therefore special attention should be paid to gait retraining and proper crutch use to avoid contralateral hip drop when weightbearing on the operative leg to avoid irritation to hip joint or repair.⁵ Patients should be advised to continue with use of assistive device for 6 weeks following surgery, or until their gait without device is without deviation. Allowing unassisted gait with deviations will cause intraarticular irritation and overuse of accessory muscles around the hip, possibly delaying the healing process.⁶

Clinicians should have a good understanding of the expected progression and healing timeframes as outlined in this protocol. If patient is not progressing appropriately, or if there is concern for post-operative complications, the surgeon should be contacted and notified of the patient's status.

Progression to the next phase of rehabilitation is based on achieving both Clinical Criteria as well as Time Frames. Variance from this needs to be reviewed by surgeon.

The intent of this protocol is to provide clinicians with a guideline of the post-operative rehabilitation for patients following arthroscopic hip surgery for femoroacetabular impingement. This protocol is not intended to mandate the course of patient care. If there are concerns regarding the patient's clinical presentation. Please consult with the referring physician prior to making adjustments to the protocol.

Procedures Performed:

<input type="checkbox"/>	Acetabuloplasty
<input type="checkbox"/>	Labral repair
<input type="checkbox"/>	Labral debridement
<input type="checkbox"/>	Labral reconstruction
<input type="checkbox"/>	Chondroplasty
<input type="checkbox"/>	Microfracture
<input type="checkbox"/>	Fibrin glue repair
<input type="checkbox"/>	Femoroplasty
<input type="checkbox"/>	Capsular repair
<input type="checkbox"/>	Iliopsoas Release
<input type="checkbox"/>	Endoscopic Trochanteric Bursa Excision
<input type="checkbox"/>	Endoscopic Abductor Repair

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Specific Case Complexity and Limitations:

- Primary Procedure**
- Revision Procedure**

Comments: _____

Pace of Protocol:

- ROUTINE**
- LESS-AGGRESSIVE**

Comments: _____

Weightbearing

Timeframe	Weightbearing
0-21 days	Partial weightbearing 20 lbs, step to pattern, foot flat gait
3-6 weeks	Gradually increase weight bearing to WBAT pain-free
6 weeks-8 weeks	Gradually wean from crutches, decrease to single crutch, then without device as tolerated

Range of Motion

Hip Motion	ROM Days 0-21	ROM Week 3-6	ROM Week 6-12	ROM Week 12+
Flexion	0-90 degrees	Gradually increase in pain free manner	Gradually increase in pain free manner	Gradually increase in pain free manner
Extension	0 degrees, no motion beyond neutral	0-10 degrees	Gradually increase to fully ROM as tolerated	If full ROM not attained, gradually increase to full ROM
Abduction	0-30 degrees	0-45 degrees	Gradually increase to full ROM as tolerated	If full ROM not attained, gradually increase to full ROM
External Rotation	0-30 degrees	0-45 degrees	Gradually increase to full ROM as tolerated	If full ROM not attained, gradually increase to full ROM
Internal Rotation	0-30 degrees	0-45 degrees	Gradually increase to full ROM as tolerated	Gradually increase to full ROM as tolerated

Bracing: none

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Phase I – Immediate Post-Surgical Phase (Day 1-28):

Initial Physical Therapy Evaluation to be scheduled 2 weeks after surgery. Patient instructed on initial exercise program by surgical team.

Goals:

- Minimize pain and inflammation
- Protect integrity of repair
- Avoid post-operative adhesions
- Improve pain-free AROM/PROM within stated parameters
- Attain non-antalgic gait with use of device and appropriate weight bearing
- Address muscle inhibition
- Patient demonstrates independence with initial home exercise program

Precautions/Guidelines:

- No active straight-leg raises throughout rehabilitation period
- Avoid ambulation to fatigue or pain
- No active hip flexion for days 0-21, hip flexion should be self-assisted for functional mobility
- No Gr III-IV hip joint mobilization for 1st 8 weeks
- No long axis hip distraction for first 8 weeks for labral repair
- No long axis hip distraction for first 12 weeks for labral reconstruction
- At all times pain and pinching in the hip joint should be avoided.

Throughout rehabilitation period every effort should be made to avoid:

- Hip flexor tendinitis
- Synovitis of operative joint
- Trochanteric bursitis
- Lower back pain or sacroiliac pain

Criteria for progression to the next phase:

- Minimal pain with ambulation
- Non-antalgic gait with use of crutches
- Minimal pain at rest
- Patient able to perform exercise program without increase in baseline pain

Patient compliant with weight bearing, home exercise program, and activity precautions

Treatment Strategies



Patient Education

Activity modification, bed mobility, positioning:

- No crossing of legs
- Avoid sitting for more than 30 minutes for first 2 weeks, vary position frequently throughout the day. Gradually increase sitting time as tolerated after first 2 weeks.
- Sit with hip angle less than 90 degrees by sitting on a high chair or sit slightly reclined
- Prone lying 15 minutes 2-3 times per day to avoid hip flexor contracture
- Assist operative leg when getting in/out of bed, in/out of car and for all functional mobility
- Consider obtaining raised toilet seat to avoid hip flexion greater than 90 degrees when sitting on toilet

Manual Therapy

- Soft tissue mobilization as appropriate for quadriceps, hamstrings, TFL, gluteus medius, iliacus, psoas, quadratus lumborum, lumbar paraspinals. Avoid suture sites until sutures removed and incisions healed.
- Joint mobilizations to lumbar spine/sacrum to address lumbosacral dysfunction as indicated
- Gr I-II hip joint mobilizations for pain modulation as appropriate
- Initiate hip circumduction and passive IR as indicated below

<p>PROM Hip Circumduction at 70° Hip Flexion</p> <ul style="list-style-type: none">• Setup: The patient should begin lying on their back. The provider should hold the patient's leg just above the knee and under the heel, with the patient's hip bent at a 70 degree angle.• Movement: The provider should gently move the patient's hip in a small clockwise motion, then counterclockwise direction.• Tip(s): The provider should only move the patient's leg in a gentle, pain-free range of motion.	
<p>PROM Hip Internal and External Rotation</p> <ul style="list-style-type: none">• Setup: The patient should be lying on their back with their legs straight. The provider should grasp the patient's closest leg with one hand on the thigh and the other on the shin.• Movement: The provider should then gently rotate the patient's leg inward approximately 30 degrees, then back to neutral, then outward approximately 30 degrees keeping it on the bed with the knee straight.• Tip(s): The patient should stay as relaxed as possible during the exercise.	

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Gait Training




- Gait training with B axillary crutches maintaining indicated weight bearing
- Stair training with step to pattern, maintaining indicated weight bearing with rail/assistive device

Modalities

- Cryotherapy as needed
- Electrical stimulation for pain management as needed





Therapeutic Exercise:

Note: Dosage of exercises to be prescribed by physical therapist as appropriate. Recommendations have been made when appropriate. Exercise instructions are written in patient friendly language.

<p>Supine Ankle Pumps</p> <ul style="list-style-type: none">• Setup: Begin lying on your back with your legs straight.• Movement: Slowly pump your ankles by bending and straightening them.• Tip(s): Try to keep the rest of your legs relaxed while you move your ankles.	
<p>Supine Quad Set</p> <ul style="list-style-type: none">• Setup: Begin lying on your back on a bed or flat surface with your legs straight.• Movement: Tighten the muscles in the thigh of your surgical leg as you straighten your knee. Hold, then relax and repeat.• Tip: Make sure to keep your toes pointing toward the ceiling during the exercise. Try to flatten the back of your knee towards the bed.	
<p>Supine Glute Set</p> <ul style="list-style-type: none">• Setup: Begin lying on your back with your hands resting comfortably.• Movement: Tighten your buttock muscles, then release and repeat.• Tip(s): Make sure not to arch your low back during the exercise or hold your breath as you tighten your muscles.	

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<p>Transversus Abdominis Activation Hooklying</p> <ul style="list-style-type: none"> • Setup: Begin lying on your back with your knees bent, feet resting on the floor, and your fingers resting on your stomach just above your hip bones. • Movement: Tighten your abdominals, pulling your navel in toward your spine and up. You should feel your muscles contract under your fingers. Hold this position, then relax and repeat. • Tip(s): Make sure to keep your back flat against the floor and do not hold your breath as you tighten your muscles 	
<p>Prone Knee Flexion</p> <ul style="list-style-type: none"> • Setup: Begin lying face down with your legs straight. • Movement: Bend one knee, bringing your foot as close as possible toward your body. Once a gentle stretch is felt in the thigh, hold the position for 10 seconds • Tip: Make sure to keep your upper body relaxed during the exercise and do not arch your back as you bend your knee. This should not cause pain. 	
<p>Passive Supine Hip Flexor Stretch</p> <ul style="list-style-type: none"> • Setup: Lie flat on your back with one pillow under your hips. • Movement: relax all muscles and you will feel a gentle stretch in the front of your operative leg. Hold position for 10 minutes 3 x per day 	
<p>Upright Stationary Bike</p> <ul style="list-style-type: none"> • Setup: Seat slightly elevated to minimize excessive hip flexion • Movement: Pedal with slow, controlled motion. No resistance • Tip(s): Start with 5 minutes, 2 x per day gradually increase to 20 minutes 2 x per day 	

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Phase II – Protection Phase (day 21-week 6):

Goals:

Progress weight bearing as appropriate per timeline
Progress ROM as tolerated per protocol
Minimize pain and inflammation
Protect integrity of repair
Avoid post-operative adhesions
Improve pain-free AROM/PROM within stated parameters
Attain non-antalgic gait with use of device and appropriate weight bearing
Address muscle inhibition
Patient demonstrates independence with initial home exercise program

Precautions/Guidelines:

- No active straight-leg raises for 8 weeks
- No active hip flexion for days 0-21, hip flexion should be active assisted for functional mobility
- No Gr III-IV hip joint mobilization for 1st 6 weeks
- No long axis hip distraction for first 8 weeks for labral repair
- No long axis hip distraction for first 12 weeks for labral reconstruction
- At all times pain and pinching in the hip joint should be avoided.
- Avoid functional activities that cause hip pain

Avoid:

- Hip flexor tendinitis
- Synovitis of operative joint
- Trochanteric bursitis
- Lower back pain or sacroiliac pain

Treatment Strategies:

Gait Training

- Increase to weightbearing as tolerated with B axillary crutches and normalize gait pattern. Avoid contralateral pelvic drop.
- As tolerated decrease to single crutch and normalize gait pattern.
- Wean from crutches by 6-8 weeks as tolerated.

Manual Therapy

- Soft tissue mobilization as appropriate for quadriceps, hamstrings, TFL, gluteus medius, iliopsoas, quadratus lumborum, lumbar paraspinals
- Joint mobilizations to lumbar spine/sacrum to address lumbosacral dysfunction as indicated
- Gr I-II hip joint mobilizations as appropriate
- Scar mobilization to portal scars as appropriate
- PROM small range hip circumduction at 70 degrees flexion
- PROM log rolls to internal rotation/external rotation
- PROM all motions within allowed ROM

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Modalities

- Cryotherapy as needed
- Electrical stimulation for pain management as needed

Therapeutic Exercise





Continue with Phase I exercises as deemed appropriate by treating physical therapist

Phase IIa Exercises, Initiate beginning week 3 as tolerated:

<p>Quadruped Rocking</p> <ul style="list-style-type: none">• Setup: begin on all fours, with your arms positioned shoulder width apart and your knees resting on a cushion.• Movement: Slowly rock back and forth, shifting your weight between your arms and your legs.• Tip: Make sure to keep your back straight and chin tucked during the exercise. Maintain equal weight distribution between both sides of your body.	
<p>Hip rotations on stool IR/ER</p> <ul style="list-style-type: none">• Setup: Begin in a standing upright position with the knee of your affected leg resting on a spinning stool or chair.• Movement: Slowly turn your thigh inward so your foot moves out to your side, then turn your thigh outward so your foot moves in toward your opposite leg, and repeat.• Tip(s): Make sure to maintain an upright posture and keep your balance during the exercise.	
<p>Prone B hip IR</p> <ul style="list-style-type: none">• Setup: Begin lying on your stomach.• Movement: Bend both knees to a 90 degree angle, tighten your abdominals, and let both of your legs fall outward as far as you can. Bring them back together, then repeat.• Tip: Make sure to keep your abdominals tight and do not let your low back arch during the exercise	





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<p>Hook-lying Lumbar Rotation (small range)</p> <ul style="list-style-type: none"> • Setup: Begin lying on your back with your knees bent and feet resting on the floor • Movement: Keeping your back flat, slowly rotate your knees slightly toward one side, then back to the other side. • Tip: Make sure that your back and shoulders stay flat on the floor. 	
<p>Hip ABD/ADD Isometrics Hook-lying</p> <ul style="list-style-type: none"> • Setup: Begin lying on your back with your knees bent, a ball between your knees, and a belt looped around your knees. • Movement: Gently press your knees out into the belt, hold briefly, then squeeze your knees into the ball, and hold briefly. Continue alternating these movements. • Tip: Make sure to continue breathing evenly. There should be little to no movement during the exercise. 	
<p>Hook-lying Gluteal Set</p> <ul style="list-style-type: none"> • Setup: Begin lying on your back with your knees bent and heels on the floor. • Movement: Tighten your buttock muscles, digging your heels into the floor, then release and repeat. • Tip: Make sure to keep your low back flat on the floor during the exercise. 	
<p>Standing Knee Flexion</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position with your hands resting on the back of a chair in front of you for support. • Movement: Slowly bend your operative knee, lifting your foot as far as possible. • Tip: Make sure to maintain your balance, stand up straight, and do not bend at your waist during the exercise. 	

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<p>Quadruped Hip Extension Knee Slides for Operative Leg w/TrA Activation</p> <ul style="list-style-type: none"> • Setup: Begin on all fours. • Movement: Tighten your abdominal muscles, pulling your navel in and up towards your spine. Then slide the knee of your operative hip back approximately 6 inches • Tip: Your hips should stay level and your lower leg should stay on the surface 	
<p>Quadruped ‘Cat and Camel’ Exercise</p> <ul style="list-style-type: none"> • Setup: Begin on all fours with your arms directly under your shoulders and knees bent 90 degrees. • Movement: Slowly round your back up toward the ceiling, then let it sag down to the floor while looking up, and repeat. • Tip: Make sure to use your entire back for the motion and keep your movements slow and controlled. You should not feel any pain in your hip. 	
<p>Supine Modified Thomas Stretch (operative leg straight)</p> <ul style="list-style-type: none"> • Setup: Begin lying on your back with your legs straight. • Movement: Slowly lift your non-operative leg and hug your knee toward your chest until you feel a gentle stretch in the front of your hip of the leg that is straight. • Tip: Make sure to keep your abdominals engaged and your opposite leg flat on the surface. 	
<p>Sidelying Piriformis Stretch</p> <ul style="list-style-type: none"> • Setup: Patient sidelying operative hip up, bend knee of operative leg and support on 1-2 pillows. • Movement: Should feel gentle stretch in gluteal muscles without any pain or pinching in hip. 	





Cardiovascular Exercise:

Upright bike up to 20 minutes, 2 x per day with seat slightly elevated to minimize excessive hip flexion, no resistance.

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Phase IIb Exercises, Initiate week 4 as tolerated:

<p>Bilateral Bridging</p> <ul style="list-style-type: none">• Setup: Begin lying on your back with your knees bent and feet resting flat on the floor.• Movement: Lift up through your pelvis as you exhale, inhale and slowly lower back down, and repeat.• Tip: Make sure to engage your core, maintain a neutral spine, and keep your upper back on the floor during the exercise.	
<p>Standing Hip Abduction</p> <ul style="list-style-type: none">• Setup: Begin in a standing upright position with your hands resting on a counter.• Movement: Lift your operative leg out to the side and back on a diagonal, then return to the starting position and repeat.• Tip: Make sure to keep your moving leg straight and do not bend or rotate your trunk during the exercise. Use the counter to help you balance as needed.	
<p>Quadruped Hip Extension for Operative Leg</p> <ul style="list-style-type: none">• Setup: Begin on all fours with your arms under your shoulders and knees under your hips.• Movement: Extend your operative leg straight back so that it is parallel with the ground and your toes are pointing toward the floor. Hold 2-3 seconds), then return to the starting position.• Tip: Make sure to keep your back straight and maintain a gentle chin tuck during the exercise. Do not let your trunk rotate while moving your leg.	
<p>Standing Hip Extension to Neutral</p> <ul style="list-style-type: none">• Setup: Begin in a standing with a slightly flexed trunk in front of a counter or stable surface for support.• Movement: Tighten your buttock muscles and slowly lift your operative leg backward in a small motion. Return to the starting position and repeat.• Tip: Make sure to keep your operative knee straight and keep your shoulders and hips facing forward during the exercise. Do not bend forward at your hips.	

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<p>Counter Plank</p> <ul style="list-style-type: none"> • Setup: Begin standing with your hands resting on a table. • Movement: Lean onto the table with both hands as you keep your elbows straight and walk your feet backward into a plank position. Hold this position. • Tip: Make sure to keep your back straight, abdominals tight, and maintain a gentle chin tuck throughout the exercise. 	
<p>Single Leg Balance</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position with your feet together and arms resting at your sides. • Movement: Lift one non-operative foot off the floor, balancing on your operative leg. Maintain your balance in this position. • Tip: Try not to move your arms away from your body or let your weight shift from side to side. 	
<p>Sidelying Clamshell in Neutral</p> <ul style="list-style-type: none"> • Setup: Begin lying on your side with your knees bent at a 90 degree angle behind you. • Movement: Lift your top knee upward. Hold briefly, then slowly lower it back down and repeat. • Tip: Make sure not to let your hips fall backward as you lift your leg. 	
<p>Hip Internal Rotation Prone with Resistance</p> <ul style="list-style-type: none"> • Setup: Begin lying on your front with one knee bent at a 90 degree angle and a resistance band looped around that ankle, anchored on your opposite side. • Movement: Slowly rotate your bent leg outward against the resistance, then bring it back to the starting position and repeat. • Tip: Make sure to keep your hips flat on the ground during the exercise. 	

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Criteria for progression to the next phase:

- 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 joint inflammation, muscular irritation, or pain
- Good neuromuscular control and optimal muscle firing patterns

Phase III – Intermediate phase (week 6-12):

Goals:

- Performance of exercise program without hip pain
- Normalize hip ROM through appropriate ROM progression as outlined
- Good activation of hip musculature without evidence of muscle inhibition
- Normalized soft tissue of hip and lumbopelvic region
- Normal gait without evidence of gait deviations

Precautions:

- No extreme combined ROM (e.g. flexion/IR, flexion/ER)
- No plyometrics
- No running
- No squatting below 90 degrees
- Avoid painful ROM
- No pivoting on operative leg
- Avoid extreme combined hip ROM
- Avoid symptom provocation during ambulation, ADLs, or therapeutic exercise and avoid post-activity soreness
- Avoid pinching in operative hip with range of motion exercises

Treatment Strategies:

Gait Training:

- Normalize gait without device.
- If patient has pain with ambulation continue to use 1 crutch and wean as tolerated.

Manual Therapy:



- Soft tissue mobilization as appropriate for quadriceps, hamstrings, TFL, gluteus medius, piriformis, quadratus lumborum, lumbar paraspinals
- Joint mobilizations to lumbar spine/sacrum to address lumbosacral dysfunction as indicated
- Gr III-IV hip joint mobilization as needed to address joint hypomobility
- Long axis hip distraction if needed beginning at 8 weeks for labral repair
- No long axis hip distraction for first 12 weeks for labral reconstruction
- PROM small range hip circumduction at 70 degrees flexion
- PROM log rolls to external and internal rotation
- PROM all motions within allowed ROM

Modalities

- Cryotherapy as needed
- Electrical stimulation for pain management as needed





Therapeutic Exercise:

Continue with Phase I and II exercises as deemed appropriate by therapist

<p>Sidelying Hip Abduction</p> <ul style="list-style-type: none">• Setup: Begin lying on your non-operative side with your bottom knee bent and your operative knee straight.• Movement: Raise your operative leg toward the ceiling, keeping your knee straight.• Tip: Make sure that your hips do not roll forward or backward during the exercise.	
<p>Bridge with Alternating Leg Extension Setup</p> <ul style="list-style-type: none">• Setup: Begin lying on your back with your arms resting at your sides, your knees bent, and your feet flat on the ground.• Movement: Tighten your abdominals and slowly lift your hips off the floor into a bridge position. Keeping your trunk stiff, straighten your operative knee and hold.• Tip: Make sure to maintain your balance during the exercise and do not let your hips fall towards the ground.	





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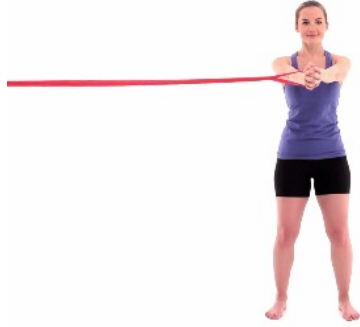

<p>Side Plank- modified (knees/forearm)</p> <ul style="list-style-type: none"> • Setup: Begin lying on your side with your knees bent, propped up on your forearm. Your elbow should be directly under your shoulder. • Movement: Engage your abdominal muscles and raise your hips up into a side plank position, keeping your knees on the ground. Hold this position, then return to the starting position and repeat on opposite side • Tip: Make sure to keep your core engaged during the exercise. Do not hold your breath or let your hips roll forward, backward, or drop towards the floor. 	
<p>Modified Plank (knees/forearms)</p> <ul style="list-style-type: none"> • Setup: Begin lying on your stomach with your elbows on the ground. • Movement: Press yourself up into a plank position, keeping your knees on the ground. Return to the starting position and repeat. • Tip: Make sure to keep your back straight in the plank and look straight down between your hands during the exercise. 	
<p>Quadruped Alternating Leg Extension (progress to opposite arm/leg as tolerated)</p> <ul style="list-style-type: none"> • Setup: Begin on all fours with your arms under your shoulders and knees under your hips. • Movement: Extend your operative leg straight back so that it is parallel with the ground and your toes are pointing toward the floor. Hold briefly, then return to the starting position and repeat with the opposite leg. • Tip: Make sure to keep your back straight and maintain a gentle chin tuck during the exercise. Do not let your trunk rotate while moving your leg 	
<p>Partial Range Squats (gradually increase to 90 degree squats)</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position, with your feet slightly wider than shoulder width apart. • Movement: Bend your knees and hips into a mini squat position, then straighten your legs and repeat. • Tip: Make sure to keep your back straight and do not let your knees bend forward past your toes. 	

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<p>Prone Hip Extension Setup</p> <ul style="list-style-type: none"> • Setup: Begin lying on your stomach with your forehead resting on a towel roll. Position a pillow under your lower abdomen and hips. • Movement: Slowly lift your operative leg, hold, then return to the starting position and repeat with opposite leg • Tip: Make sure to keep your leg straight and focus on engaging your buttock muscles during the exercise. Do not let your back arch or your hips rotate side to side. 	
<p>Single Leg Forward Weight Shifts (progressing to Romanian dead lift)</p> <ul style="list-style-type: none"> • Setup: Begin in a standing position balancing on your operative leg with your hands resting on your waist. • Movement: Lean forward by bending at your hips and knee. • Tip: Make sure to keep your back straight and chin tucked 	
<p>Lateral Band Walk</p> <ul style="list-style-type: none"> • Setup: Begin standing upright with a resistance band looped around your thighs, just above your knees. Bend your knees slightly so you are in a mini squat position. • Movement: Slowly step sideways, maintaining tension in the band. • Tip: Make sure to keep your feet pointing straight forward and do not let your knees collapse inward during the exercise. 	
<p>Backwards Monster Walk With Band</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position with a resistance band looped around your ankles. • Movement: Slightly bend your knees into a mini squat position. Step diagonally backward with one foot, then slowly bring your feet together. Repeat in the opposite direction. • Tip: Make sure to keep your chest upright and do not bend your knees forward past your toes. 	

<p>Banded Hip Clamshell</p> <ul style="list-style-type: none"> • Setup: Begin by lying on your non-operative side with your knees bent 90 degrees, hips and shoulders stacked, and a resistance loop secured around your legs. • Movement: Raise your operative knee away from the bottom one, then slowly return to the starting position. • Tip: Make sure not to roll your hips forward or backward during the exercise. 	
<p>Single Leg Balance with Clock Taps</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position. Imagine you are standing in the middle of a clock. • Movement: Bend your legs slightly, then reach forward with non-operative(?) foot toward 12 o'clock, then bring it back to the starting position and reach toward 3 or 9 o'clock. Continue, reaching toward 6 o'clock, and repeat. • Tip: Make sure to keep your hips level as you reach with your leg, and do not let your standing knee collapse inward 	
<p>Single Leg Balance with Hip ABD and Band Resistance</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position, holding onto a chair for support, with a resistance loop around your ankles. • Movement: Lift your operative leg off the ground and pulse leg a small amount straight out to your side. Continue this motion without letting your foot touch the ground. • Tip: Make sure to keep your abdominals tight and hips level during the exercise. 	
<p>Single Leg Balance with Hip Ext and Band Resistance</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position, holding onto a chair for support, with a resistance loop around your ankles. • Movement: Lift your operative leg off the ground and move it straight backward a small motion. Continue this pulsing the leg without letting your foot touch the ground. • Tip(s): Make sure to keep your abdominals tight and hips level during the exercise. 	

<p>Paloff Press</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position holding a resistance band in both hands that is anchored at your side. • Movement: Press your arms straight forward. Hold briefly, then bring your arms back in and repeat. Repeat for opposite side. • Tip(s): Do not allow trunk to rotate 	
<p>Standing IT Band Stretch</p> <ul style="list-style-type: none"> • Setup: Begin in a standing upright position with one leg crossed over the other. • Movement: Move the hip of your operative leg to be stretched out to the side and reach your arm overhead to the opposite side. Repeat on opposite side. • Tip: Make sure to avoid twisting or rotating your body during the exercise. 	

Lower extremity stretching as indicated by patient impairments.

Cardiovascular Exercise:

- Upright stationary bicycle: gradually increase time and resistance as tolerated
- Elliptical training: pedaling forward and backward if pain-free, gradually increase time and resistance as tolerated
- Swimming: initiate flutter kick as tolerated, avoid frog kicking

Criteria for progression to the next phase:

- ROM within normal limits pain-free
- Alternate Ascend/Descend 8-inch step with good pelvic control no UE support
- Good pelvic control during single-limb stance and dynamic balance
- Normalized gait pain-free without an assistive device
- No Pain at rest, ADL/IADL nor walking
- Strength of operative hip 75% of contralateral hip
- No joint inflammation, muscular irritation, or pain
- Good neuromuscular control and optimal muscle firing patterns

Phase IV – Advanced strengthening phase (week 12-16):

Goals:

- Independent home exercise program
- Optimize ROM
- $\geq 4/5$ LE strength, $\geq 4/5$ trunk strength
- Improved dynamic balance
- Pain-free ADL
- Pain-free hip flexion with ADLs and functional mobility

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Precautions:

- No extreme combined ROM (e.g. flexion/IR, flexion/ER)
- No plyometrics
- No running
- No squatting below 90 degrees
- Avoid painful ROM
- Avoid extreme combined hip ROM
- No symptom provocation during ambulation, ADLs, or therapeutic exercise
- Avoid pinching in operative hip with range of motion exercises

Treatment Strategies:

Manual Therapy:

- Soft tissue mobilization as appropriate for quadriceps, hamstrings, TFL, gluteus medius, piriformis, quadratus lumborum, lumbar paraspinals
- Joint mobilizations to lumbar spine/sacrum to address lumbosacral dysfunction as indicated
- Gr III-IV hip joint mobilization as needed to address joint hypomobility
- Long axis hip distraction if needed beginning at 8 weeks for labral repair
- Long axis hip distraction if needed beginning at 12 week for labral reconstruction

Modalities

- Cryotherapy as needed
- Electrical stimulation for pain management as needed

Therapeutic Exercise:

Progressive LE and core exercises- progress exercises from prior phases by increasing challenge and resistance
Advanced balance exercises as appropriate for sport or desired recreation
Sport specific plyometrics and agility exercises as appropriate
Progress core strengthening as deemed appropriate by therapist

Cardiovascular Exercise:

- Upright stationary bicycle: gradually increase time and resistance as tolerated
- Elliptical training: pedaling forward and backward if pain-free, gradually increase time and resistance as tolerated
- Swimming: initiate flutter kick as tolerated, avoid frog kicking

Criteria for progression to the next phase:

- Y Balance Test Limb symmetry index 80% of uninvolved side
- Strength of operative hip 90% of uninvolved side
- Perform progressed exercise program without pain
- No joint inflammation, muscular irritation, or pain

Phase V – Return to activity phase (week 16+):

Please note: Individuals who do not engage in higher level activities may not need to progress to advanced and sport specific activities.

Goals:

- Progress to sport specific training without pain
- Progress to jogging pain free when cleared by surgeon
- Independent home exercise program
- Optimize ROM
- 5/5 LE strength, \geq 4/5 trunk strength
- Normal Muscle Length of B LE
- Good, dynamic unilateral balance of operative extremity
- Pain-free with all activities

Precautions:

- Avoid pain in hip joint with functional activities or exercises
- If post-exercise joint pain or limping occurs, activity level should be decreased
- Avoid joint inflammation
- Focus on quality of movement and exercise

Treatment Strategies:

Manual Therapy:

- Soft tissue mobilization as appropriate for quadriceps, hamstrings, TFL, gluteus medius, piriformis, quadratus lumborum, lumbar paraspinals
- Joint mobilizations to lumbar spine/sacrum to address lumbosacral dysfunction as indicated
- Gr III-IV hip joint mobilization as needed to address joint hypomobility
- Long axis hip distraction as needed for labral repair or reconstruction

Modalities

- Cryotherapy as needed
- Electrical stimulation for pain management as needed

Therapeutic Exercises:

Progress strength, proprioception, dynamic balance, agility, and power to address sport specific demands. Sport specific retraining as tolerated.

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Cardiovascular Exercise:

- Upright stationary bicycle: gradually increase time and resistance as tolerated
- Elliptical training: pedaling forward and backward if pain-free, gradually increase time and resistance as tolerated
- Swimming: gradually progress time and swimming strokes as tolerated
- Jogging: initiate at 16-18 weeks as indicated by referring surgeon and patient status

Outcome Measures:

- Hip Outcome Score (HOS) has been validated in the hip arthroscopy population and is an appropriate outcome measure. (Enseki)
- If unavailable Lower Extremity Functional Scale (LEFS) may be used.

Criteria for discharge from skilled therapy:

- Cross over triple hop for distance 90% of uninvolved side
- Y Balance Test Limb symmetry index 80% of uninvolved side
- Patient able to jog 30 minutes
- Patient able to perform sport specific drills without pain
- Good neuromuscular control and optimal muscle firing patterns

This protocol has been written utilizing the available literature, clinical experience of physical therapists, and surgeon experience and preference. The Department of Rehabilitation Services at Brigham & Women's Hospital has accepted this protocol as our standard protocol for the management of patients following arthroscopic hip surgery for femoroacetabular impingement.

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