INLAND
Orthopaedic Surgery
& Sports Medicine Clinic

TOTAL HIP ARTHROPLASTY (ANTERIOR APPROACH) REHABILITATION GUIDELINES

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General Summary/Recommendations	
General Precautions	• WBAT, with use of assistive device (AD) as needed (crutches, walker) • Use good bending/lifting mechanics (keep back straight and bend at knees) • No range of motion (ROM) restrictions
ROM/Manual Therapy	• Early range of motion (ROM) as tolerated • Soft tissue mobilization as needed, scar mobilization once incision heals (>2-3 weeks)
Corrective Interventions	• Proper activation and recruitment of all hip and core musculature without compensation required prior to initiating strengthening • Neuromuscular re-education for balance and correction of faulty mechanics • Therapeutic exercise for lower extremity strength (double and single limb)
High Impact activities such as plyometrics and running are generally not advised following total joint replacement. First priority following these surgeries is to prevent damage to the artificial joint replacement, patients are advised to participate in lower impact exercise/activities. Patients considering plyometrics with the intent to resume running should consult with their physician.	
Criteria to Initiate Plyometric Program	• Squat > 150% BW leg press • 10 forward and lateral step downs 8in step with proper mechanics
Criteria to Initiate Running Program	• Full, functional, pain-free ROM • >80% of uninvolved quadriceps, hamstring, hip strength (hand-held dynamometer) • Squat > 150% BW (barbell squat or leg press) • 10 forward and lateral step downs from 8" step with proper mechanics • Hop and Hold with proper mechanics (uninvolved ➔ involved) • Ability to tolerate 200-250 plyometric foot contacts without reactive pain/effusion • No gross visual asymmetry and rhythmic strike pattern with running
Criteria to Return to Recreational Activities/Discharge	• Physician clearance at last check-up • Strength: >90% compared to uninvolved hip (using hand-held dynamometer) • >90% BW with SL Leg press • Demonstrate ability to simulate function sport specific movement • Patient reported outcome measures: Score greater or equal to 90% Criteria for discharge from PT is less rigorous for those not returning to sport. Ensure the patient is able to perform all ADL's and recreational activities without pain, reactive effusion, and with appropriate functional mechanics

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<table>
<tr><th colspan="3">PHASE I: Day 1 Post-op until D/C of Assistive Device (0-6 weeks)</th></tr>
<tr><td>Goals</td><td colspan="2">• Protect healing tissue
• Pain and edema control (recommend compression garments/shorts to assist)
• DVT prevention
• Improve pain-free ROM
• Normalize muscle activation
• Ambulate independently without AD
• Independent with all ADL's</td></tr>
<tr><td>Precautions</td><td colspan="2">• WBAT with use of AD as need (crutches, walker)
• Use good bending/lifting mechanics (keep back straight and bend at knees)
• Keep hips above knees when sitting, avoid deep chairs AD Progression:
o Walker ➔ less restrictive (cane) or no device
o 2 ➔ 1 ➔ 0 crutches as tolerated</td></tr>
<tr><td>Criteria for Community Ambulation without AD</td><td colspan="2">• Adequate hip FROM for normalized/pain free gait pattern (10-degree hip extension)
• Normalized gait pattern without assistive device</td></tr>
<tr><td>ROM/Stretching</td><td colspan="2">• PROM (pain free): hip flexion, extension to neutral if contracture present
• Gentle PROM, flexion AAROM in supine per guidelines
• Upright bike for ROM (maintain hip flexion precautions by starting with higher seat)
• Soft tissue mobilization and scar mobilization once incisions are closed</td></tr>
<tr><td>Neuromuscular Control</td><td colspan="2">This section is 1st priority ➔ do not progress to strengthening until muscle activation and isolated control is normalized
• Glute sets, quad sets, transverse abdominis, hamstring, performed in supine or hook lying to maintain hip precautions</td></tr>
<tr><td rowspan="2">Therapeutic Exercise</td><td>Early Exercises</td><td>• Isometrics – in hook lying hip adduction with ball/towel roll, hip abduction with belt
• SAQ, LAQ, ankle pumps
• Standing hamstring curls, marches
• SLR, standing 4-way hip
• Weight shifting ➔ SLS to wean out of AD</td></tr>
<tr><td>Late Exercises</td><td>Criteria to begin this section: normalized gait pattern, minimal reactive pain and edema
• SLR – Flexion, abduction, extension (performed in safe range. For lateral and anterior approach no extension until week 6).
• Step ups (forward and lateral) and step downs
• Begin bridge progression
• Calf raises</td></tr>
<tr><td>Criteria to Progress to Phase II</td><td colspan="2">• Normalized gait pattern for household distanced without AD
• Minimal to no reactive pain and swelling with ADLs and PT exercises
• Muscle activation and isolation is normalized
• SLS for > 20 seconds without presence of hip drop</td></tr>
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PHASE II: D/C AD to Pain Free ADLs (6-12 weeks)		
Goals	• Restore full PROM and AROM • Progressively improve strength of the proximal hip musculature (gluteals, iliopsoas, hip rotators) • Normalize postural/pelvic control with DL and SL activities • Normalize gait at preferred walking speed for community distances • Tolerate ADLs without pain or limitation	
Precautions	○ See Summary of Recommendations	
ROM/Stretching	• Soft tissue and joint mobilization to achieve symmetrical PROM • Avoid aggressive end range stretching • Soft tissue mobilization as appropriate • May benefit from referral to massage therapist if patient is developing soft tissue dysfunction/irritation (commonly affects TFL, adductors) • Soft tissue irritation suggests need for regression of activities and/or exercises • Continually assess patient's current activity level outside of PT	
Therapeutic Exercise	Early Exercises	• Mini squats to 70 degrees of flexion • Resisted side stepping (start with TB around knees) • SLS on unstable surface • Progress 3-way SLR to standing with TB or ankle weights ○ Abduction is okay to perform within 30-40 degrees of hip abduction • Progress hip external rotation strengthening
	Late Exercises	• Progress closed chain strengthening exercises: leg press, increase mini squat depth • SLS on unstable surface with perturbations • Aquatic therapy may be appropriate and can be initiated once incision is well-healed and patient is cleared by physician. ○ Begin with controlled walking in water at shoulder height progress to waist level water
Cardiovascular Exercise	• May progress time on upright bike as tolerated ○ Ensure patient can perform 30 mins with no resistance and without symptoms prior to adding resistance ○ Decrease time less or equal to 15 mins when adding resistance • May begin elliptical when patient demonstrates adequate hip extension, gluteal activation, and lumbopelvic stability	
Criteria to Progress to Phase III	• Symmetrical and pain-free hip ROM to meet the demands of patient's activities • Good (4/5) lower extremity strength • Symmetrical DL squat to 70 degrees of knee flexion • Good quality movement as graded on Forward Step-Down Test • Normalized gait pattern for community distances of ambulation	

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PHASE III: Pain Free ADLs to Return to Recreational Activities (12-20 weeks)	
This phase is only required for patients who wish to participate in recreational sport outside of general therapeutic exercise. Patients who don't plan on sport participation can be discharged with maintenance program following completion of Phase II	
Goals	• Correct abnormal/compensatory movement patterns with higher level multi-directional strengthening activities • Optimize neuromuscular control/balance/proprioception • Increase volume/intensity of aerobic activities; begin to restore low impact and sport specific cardiovascular fitness • Initiate progressive plyometric activities (per clearance of physician) • Progressively return to sport or prior/desired level of function
Precautions	• Avoid sacrificing quality for quantity during strengthening • Avoid hip flexor/adductor inflammation as activity increases • Ensure patient maintains full flexibility and pain-free ROM as strength continues to increase • Avoid aggressive stretching within this phase unless significant hypomobility noted • Closely monitor return to sport progression
ROM/Stretching	• ROM should be checked periodically to ensure that loading the hip with new exercises does not after neuromuscular response and normal joint mechanics • If full ROM is not achieved by week 12, terminal stretches should be initiated
Therapeutic Exercise	• Continue progressive LE/core strengthening: slow to fast, simple to complex, stable to unstable, ow to high force • DL to SL strengthening, for leg press and other closed chain exercises • Progress core stability tasks with emphasis on rotational and side-support tasks (side planks, cable crossovers, kneeling chops/lifts, plank over BOSU ball) • LE strengthening tasks with multiplanar movement: Emphasize core stability and hip/knee control (no valgus) during these tasks • Proprioception: Vary surfaces add perturbations, include variety of positions • Aquatic therapy: may begin free style swimming once full ROM is achieved
Cardiovascular Exercise	• Dynamic warm-up initiated • Upright Bike/Elliptical ○ Progress resistance (and cross ramp on elliptical) as tolerated • Swimming Progression (see return to swimming protocol)
Criteria to initiate plyometric program	• Full, functional, pain-free ROM • >80% quadriceps, hamstring, and hip (using hand-held dynamo-meter) strength compared to uninvolved leg • Squat 150% BW (barbell squat or leg press) • 10 Forward and lateral step-downs from 8in step with proper alignment
Progressive weight bearing,	• Shuttle plyometrics (DL ➔ SL) • Forward hop and hold (uninvolved ➔ involved)

DL ➔ SL demands	• DL mini hops/place jumps • Proper take off/landing mechanics emphasized ➔ NO knee valgus, good pelvic stability, soft-quiet landing with equal distribution of force • Modified agility work can be initiated if appropriate form/tolerance to activity in progressive plyometrics

Plyometrics/High impact activities such as plyometrics are generally not advised following total joint replacements. First priority following these surgeries is to prevent damage to the new artificial joint. Due to lack of evidence on how high impact activities affect the integrity of artificial joint replacement, patients are advised to participate low impact exercises. Patients considering plyometrics with the intention of resuming running should consult with their physician.