Rehabilitation Protocol for Total Hip Arthroplasty (THA)

This protocol is intended to guide clinicians and patients through the post-operative course for total hip arthroplasty (THA). This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. If a clinician requires assistance in the progression of a post-operative patient, they should consult with the referring surgeon.

The interventions included within this protocol are not intended to be an inclusive list of exercises. Interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Post-operative Considerations:
Many different factors influence the post-operative total hip arthroplasty rehabilitation outcomes, including surgical approach, weight bearing precautions, and trochanteric precautions (See Appendix A-B). This information can be accessed in the operative note and/or referral and must be followed until the initial post-operative appointment and thereafter, as directed by the surgeon.

If the patient develops a fever, intense calf pain, unresolving numbness/tingling, excessive drainage from the incision, uncontrolled pain or any other symptoms you are concerned about, contact the referring surgeon.

PHASE I: IMMEDIATE POST-OP (0-3 DAYS AFTER SURGERY)

Rehabilitation Goals	• Protect healing tissue • Minimize pain and swelling • Increase range of motion (ROM) • Activate lower extremity musculature • Comply with surgical precautions • Perform ADLs independently
Precautions	• Follow appropriate surgical and weight bearing precautions • Encourage ROM as tolerate, unless otherwise noted by surgical team • Avoid performing torque or twisting movements • Avoid exercises with weights/resistance other than body weight • Monitor for signs of pulmonary embolism, deep vein thrombosis, loss of peripheral nerve integrity, infection, increased swelling, and delayed wound healing

Intervention	*Range of motion/Mobility*
	• Initiate lower extremity active range of motion (AROM), active assisted range of motion (AAROM), and passive range of motion (PROM)
	  ○ Supine ankle pumps
	  ○ Supine heel slides
	  ○ Seated long arc quads
	  ○ Supine/standing hip abduction
	Strength/Stability
	• Isometric quadriceps, hamstrings, and gluteal exercises
	  ○ Supine quad sets
	  ○ Supine glute sets
	  ○ Supine hamstring sets
	• Closed chain exercises if patient demonstrate good pain control and muscle strength
	  ○ Heel raises

	○ Sit to stand *Functional mobility and training* • Bed mobility • Transfers • Gait training on level surfaces • Stair training • ADLs with adaptive equipment
Criteria to Progress	• Minimal pain and inflammation • Independent bed mobility, transfers, and ambulation at least 100 feet with appropriate assistive device • Ability to negotiate stairs independently with least restrictive device • Compliance with post-operative precautions • Compliance with home exercise program • Ability to safely perform ADLs independently or with appropriate available assistance

PHASE II: EARLY MOTION PHASE (1-3 WEEKS AFTER SURGERY) AND LATE MOTION PHASE (3-6 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Minimize pain and swelling • Improve range of motion, respecting hip precautions • Strengthen hip musculature • Initiate proprioceptive training • Initiate endurance training • Normalize gait pattern: Assistive devices are discontinued when patient can ambulate without pain, balance difficulties, or gait deviation, including a positive Trendelenburg sign
Precautions	• Refer to precautions in Phase I • Refer to surgical team instructions as some precautions are often lifted between weeks 3-6
Additional Intervention **Continue with Phase I interventions*	*Range of motion/mobility (focus on hip flexion and external rotation)* • Progress hip flexion ROM: Supine Heel slides → Supine hamstring stretch →Standing march • Progress hip ER ROM: Butterfly stretch →Heel slides with ER bias →Seated AAROM Hip ER with flexion →Modified piriformis stretch →Piriformis stretch • Initiate gastrocnemius/soleus stretching • Initiate quadriceps stretching • Perform soft tissue mobilization and scar mobilization once incisions are closed Initiate stationary bike with 0 to minimal resistance *start at 3 weeks *Strength/Stability* • Standing hamstring curls • Standing 4 way hip exercises, respecting hip precautions • Standing step ups (forward, lateral) and step downs *start at 3 weeks • Supine 4 way straight leg raises *start at 3 weeks, respecting hip precautions, avoid hip flexor overuse • Supine bridge *start at 3 weeks • Standing mini squats *start at 3 weeks *Functional mobility and training* • Gait training • Stair training • Progression of hip flexion ROM in functional tasks: Sit to stand→ Squat→ Bicycle • Retrain functional movements ○ Lifting/carrying ○ Pushing/pulling ○ Tasks required to return to work *Balance/proprioception* • Weight shifting activities

	• Side stepping • Backward walking *start at 3 weeks • Walking on uneven surfaces *start at 3 weeks *Endurance training* • Progress walking distance on treadmill or flat terrain • Stationary bicycle • Begin aquatic program *if incision is complete healed and cleared by surgical team
Criteria to Progress	• Normalized gait with no (or least restrictive) assistive device for household distances • Minimal pain and inflammation • SLR without lag • Active hip flexion 110 deg • Single leg stance for >20 sec without hip drop

Additional Considerations	*Patient Reported Outcome Measures*
	• It is recommended upon the start of postoperative care in the ambulatory clinic that that patient completes a functional outcome measure during the first ambulatory visit. This measure is then completed every 30 days and upon discharge from physical therapy. Options include:
	  ○ Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)
	  ○ Hip Disability and Osteoarthritis Outcome Score (HOOS)
	  ○ Lower Extremity Functional Scale (LEFS)

PHASE III: INTERMEDIATE PHASE (6-12 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Restore/improve strength of all lower extremity musculature • Return to most functional activities and begin light recreational activities
Precautions	• Refer to surgical team instructions as some precautions are often lifted after week 6 • Avoid high impact activities • Avoid activities that require repeated pivoting/twisting

Additional Intervention **Continue with Phase I-II interventions*	*Range of motion/Mobility*
	• Soft tissue and joint mobilization to achieve symmetrical PROM
	
	Strength/Stability
	• Standing hip abduction with band
	• Side-lying clam shell
	• Standing lateral band walk
	• Side-lying hip abduction with band
	• Side-lying hip abduction with ankle weights
	• Side bridge
	• Supine hip flexion with band
	• Hip hike
	• Double leg squats
	• Single leg squats
	• Split squats
	• Single leg bridge
	• Deadlift
	• Romanian deadlift
	
	Balance/proprioception
	• Static Balance
	  ○ Single leg stance on level surface
	  ○ Single leg stance on uneven surface
	  ○ Single leg stance with perturbation
	• Proprioceptive training on dynamic surfaces
	  ○ Double leg stance on balance board/rocker board
	• Agility training
	  ○ Tandem walking

	○ Walking on uneven surfaces *Endurance training* • Progress treadmill walking: time/speed • Stationary bicycle: mild to moderate resistance • Elliptical machine • Swimming or aquatic exercise
Criteria to Progress	• Normalized gait with no (or least restrictive) assistive device for community distances • Symmetrical and pain-free hip A/PROM to meet the needs of the patient's activities • All lower extremity musculature ≥80% strength of non-operative limb • Good quadriceps control with lateral step-down test

PHASE IV: ADVANCED STRENGTHENING/RETURN TO ACTIVITY PHASE (12-16+ WEEKS AFTER SURGERY)

Rehabilitation Goals	• Continue to improve strength, endurance, and proprioception to maximize functional outcomes • Return to recreational activities/sports per clearance of physician
Precautions	• Avoid high impact activities unless cleared by physician • Monitor for increased pain and inflammation
Additional Intervention **Continue with Phase I-III interventions*	*Strength/Stability* • Progress resistance/load and incorporate more complex multi-joint movements as tolerated ○ Standing front foot elevated split squats ○ Standing rear foot elevated split squats ○ Supine hip thrust with weight ○ Supine bridge with leg curl • Progress hip abduction external rotation strengthening from Phase III • Progress core stability tasks with emphasis on rotational and side-support tasks ○ Side planks ○ BOSU ball planks *Balance/proprioception* • Proprioceptive training on dynamic surfaces ○ Single leg balance on balance board/rocker board • Reactive and perturbation training with dual task challenges • Spiral line chopping/lifting PNF diagonals • Begin Agility and Plyometric Program *Endurance training* • Begin Return to Running program ****High impact activities such as plyometrics and running are generally discouraged following total joint arthroplasty, but consideration must be given to patients' goals and whether they have prior experience performing the high impact activity. Due to limited evidence on how high impact activities affect the integrity of artificial joint replacement, patients are advised to participate in low/moderate impact exercise/activities. Consult surgeon prior to initiating plyometric activities and return to run program.**
Criteria to Progress	• Quad/HS/glut limb symmetry index ≥95%; HHD mean or isokinetic testing @ 60d/s • Hamstring/Quad ratio ≥66% • Return to work • Participation in desired low impact activities without pain or inflammation • Maintain a "quiet" hip • Clearance from surgeon to progress to appropriate training (e.g. plyometrics; running) for higher impact activities

06/2025

Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol

References:

1. Ang JJM, Onggo JR, Stokes CM, Ambikaipalan A. Comparing direct anterior approach versus posterior approach or lateral approach in total hip arthroplasty: a systematic review and meta-analysis. *Eur J Orthop Surg Traumatol*. 2023;33(7):2773-2792. doi:10.1007/s00590-023-03528-8
2. Coulter, Corinne L., et al. "Physiotherapist-directed rehabilitation exercises in the outpatient or home setting improve strength, gait speed and cadence after elective total hip replacement: a systematic review." *Journal of physiotherapy* 59.4 (2013): 219-226.
3. Galea, Mary P., et al. "A targeted home-and center-based exercise program for people after total hip replacement: a randomized clinical trial." *Archives of physical medicine and rehabilitation* 89.8 (2008): 1442-1447.
4. Kenanidis E, Milonakis N, Georgios F, Potoupnis M, Tsiridis E. Superior Transverse Atraumatic Reconstruction (STAR) approach provides a better-compared outcome to standard Direct Superior Approach (DSA): a matched, prospective comparative single-surgeon study. *SICOT J*. 2023;9:10. doi:10.1051/sicotj/2023008
5. Monaghan, B., et al. "Randomised controlled trial to evaluate a physiotherapy-led functional exercise programme after total hip replacement." *Physiotherapy* 103.3 (2017): 283-288.
6. Nankaku, Manabu, et al. "Hip external rotator exercise contributes to improving physical functions in the early stage after total hip arthroplasty using an anterolateral approach: a randomized controlled trial." *Disability and rehabilitation* 38.22 (2016): 2178-2183.
7. Singh, Gursimran, et al. "Recovery of Muscular Strength Following Total Hip Replacement: A Narrative Review." *Cureus* 16.8 (2024): e68033.
8. Sundaram K, Siddiqi A, Kamath AF, Higuera-Rueda CA. Trochanteric osteotomy in revision total hip arthroplasty. *EFORT Open Rev*. 2020;5(8):477-485. Published 2020 Sep 10. doi:10.1302/2058-5241.5.190063
9. Total Hip Replacement: How Long Does It Take to Recover? Journal of Orthopaedic & Sports Physical Therapy 2011 41:4, 240-240

APPENDIX A: DISLOCATION PRECAUTIONS

Posterior Precautions	• No hip flexion >90 deg • No hip internal rotation or adduction beyond neutral • None of the above motions combined
Anterior Precautions	• No hip extension or external rotation beyond neutral • None of the above motions combined • When the patient is supine, keep the hip flexed at or above 30 degrees ○ No early heel slides or straight leg raise
Direct Anterior Precautions	• No full bridging
Lateral Precautions	• Hip abduction restrictions
Limited Precautions	• Either posterior or direct anterior approach • Avoid any extremes of movement or uncomfortable positions • No hip extension or external rotation beyond neutral • None of the above motions combined
Global Precautions	• Combination of both anterior and posterior precautions, described above • Often ordered for patients following hip resurfacing, due to full exposure of the femoral head and opening of joint capsule during surgery. Also often ordered after revision surgery due to a history of dislocations.
Superior Transverse Atraumatic Reconstruction Precautions	• No end range passive motion or "extremes of motion"
No Dislocation Precautions	• Determined by the surgeon, often after anterolateral and minimally invasive surgical approaches or hemiarthroplasty procedures • Do not assume there are no precautions if none are documented – clarify with the surgical team

APPENDIX B: TROCHANTERIC PRECAUTIONS

Trochanteric Precautions	• No active hip abduction to limit gluteus medius contractions • No passive hip adduction to limit the stretching of the gluteus medius ○ May be paired with standard total hip precautions