

TOTAL HIP REPLACEMENT POST-OP CLINICAL PRACTICE GUIDELINE

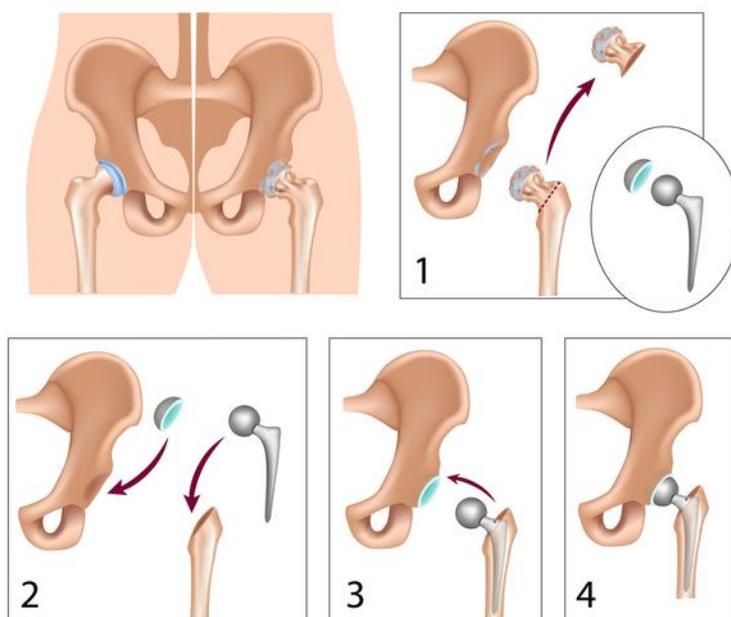
Progression is time and criterion-based, dependent on soft tissue healing, patient demographics and clinician evaluation. Contact Ohio State Sports Medicine at 614-293-2385 if questions arise.

Overview

Total hip arthroplasty (THA), also known as a total hip replacement is an elective surgical procedure to treat patients who experience pain and dysfunction from an arthritic hip joint. THA is an effective option if the patient's pain does not respond to conservative treatment and has caused a decline in their health, quality of life, or ability to perform activities of daily living. This procedure removes the arthritic structures that make up the hip joint and replaces them with artificial implants. The head of the femur, which makes up the ball of the hip joint, is removed and replaced by a smooth ball with a stem fixed within the femur. The acetabulum, which makes up the socket portion of the hip joint, is fitted with a metal socket with a smooth inner lining. Once in place, the artificial pieces allow improved function of the hip joint.

With advancements in modern medicine, there have been several effective surgical approaches developed for THA, including anterior, posterior, anterolateral, posterolateral, and lateral approaches. The surgeon will determine the best surgical approach to use for each individual. For each approach, there are different precautions that must be followed to decrease risk of dislocation based on the tissues that were affected during surgery. Patients are encouraged to participate in early mobilization while adhering to precautions in order to improve function and limit post-operative complications.

Total Hip Replacement



Summary of Recommendations

Precautions (strictly adhered to for first 6 weeks, guarded progression thereafter)	Anterior approach: <ul style="list-style-type: none"> No hip extension past 20 degrees No hip external rotation past 50 degrees Posterior approach <ul style="list-style-type: none"> No hip flexion past 90 degrees No hip internal rotation or adduction past neutral General precautions <ul style="list-style-type: none"> WBAT, with use of assistive device (AD) as needed (crutches, walker) No crossing legs (crossing ankles OK) Use good bending/lifting mechanics (keep back straight and bend at knees) Keep hips above knees when sitting, avoid sitting in deep chairs
ROM/Manual Therapy	<ul style="list-style-type: none"> Early range of motion (ROM) as tolerated within the restricted range Soft tissue mobilization as needed, scar mobilization once incision heals (>2-3 wks)
Corrective Interventions	<ul style="list-style-type: none"> 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)
Outcome Testing	<ul style="list-style-type: none"> Select based on the needs of the patient and practice setting recommendations Patient reported outcomes: VAS/NRPS, Lower Extremity Functional Scale, Hip Osteoarthritis Outcome Score, Hip Outcome Score: ADL (17 items) Sports (9 items) Performance tests: 30-Second Chair Stand Test, Gait Speed, TUG, Functional Reach Test, 6-min Walk Test
Criteria to Initiate Plyometric Program	<p>High impact activities such as plyometrics and running 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 in low impact exercise/activities. Patients considering plyometrics with the intent to resume running should consult with their physician.</p> <ul style="list-style-type: none"> Full, functional, pain-free ROM > 80% quadriceps, hamstring, and hip (using hand-held dynamometer) strength compared to uninvolved leg Squat > 150% BW leg press 10 forward and lateral step downs from 8" step with proper mechanics
Criteria to Initiate Running Program	<ul style="list-style-type: none"> 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 for Return to Recreational Activities/ Discharge	<ul style="list-style-type: none"> 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 functional sport specific movement Patient reported outcome measures: Score ≥ 90% <p><i>***Criteria for discharge from PT is less rigorous for those not returning to sport. Ensure the patient is able to perform all ADLs and recreational activities without pain, reactive effusion, and with appropriate functional mechanics.</i></p>



Phase I: Day 1 Post-Op until D/C of Assistive Device (0-6 weeks)

Goals	<ul style="list-style-type: none"> • 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 	
Precautions	<p>Anterior approach</p> <ul style="list-style-type: none"> • No hip extension past 20 degrees • No hip external rotation past 50 degrees <p>Posterior approach</p> <ul style="list-style-type: none"> • No hip flexion past 90 degrees • No hip internal rotation or adduction past neutral <p>General precautions</p> <ul style="list-style-type: none"> • WBAT, with use of AD as needed (crutches, walker) • No crossing legs • Use good bending/lifting mechanics (keep back straight and bend at knees) • Keep hips above knees when sitting, avoid deep chairs 	
AD Progression	<ul style="list-style-type: none"> • Walker → less restrictive (cane) or no device • 2 → 1 → 0 crutches as tolerated 	
Criteria for Community Ambulation without AD	<ul style="list-style-type: none"> • Adequate hip ROM for normalized/painfree gait pattern (10° hip extension) • 60 secs of single leg stance (SLS) without compensation (hip drop, trunk lean) or pain • Normalized gait pattern without assistive device 	
ROM/ Stretching	<ul style="list-style-type: none"> • PROM (painfree): 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 	
Neuro-muscular Control	<p><i>This section is 1st priority → do not progress to strengthening until muscle activation and isolated control is normalized</i></p> <ul style="list-style-type: none"> • Glute sets, quad set, transverse abdominis, hamstrings, performed in supine or hook lying to maintain hip precautions. 	
Therapeutic Exercise	<p><u>Early Exercises</u></p> <ul style="list-style-type: none"> • Isometrics – in hooklying 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 	<p><u>Late Exercises</u></p> <ul style="list-style-type: none"> • Criteria to begin this section: normalized gait pattern, minimal reactive pain and edema • SLR – flexion, abduction, extension (extension performed in safe range. For lateral and anterior approach no extension until week 6) • Step ups (forward, lateral) and step downs • Begin bridge progression • Calf raises
Criteria to Progress to Phase II	<ul style="list-style-type: none"> • Normalized gait pattern for household distances 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 	



Phase II: D/C AD to Pain Free ADLs (6-12 weeks)

Goals	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • See above (Summary of Recommendations) 	
ROM/ Stretching	<ul style="list-style-type: none"> • Soft tissue and joint mobilization to achieve symmetrical PROM • Avoid aggressive end range stretching • AROM upright bike (maintain hip flexion precautions), progress to light resistance • 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	<u>Early Exercises</u> <ul style="list-style-type: none"> • 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 (steamboats) • Progress hip external rotation strengthening 	<u>Late Exercises</u> <ul style="list-style-type: none"> • 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
Cardio-vascular Exercise	<ul style="list-style-type: none"> • May progress time on upright bike as tolerated <ul style="list-style-type: none"> • Ensure pt can perform 30 mins with no resistance and without symptoms prior to adding resistance • Decrease time to ≤15 min when adding resistance • May begin elliptical when patient demonstrates adequate hip extension, gluteal activation, and lumbopelvic stability 	
Criteria to Progress to Phase III	<ul style="list-style-type: none"> • Symmetrical and painfree hip ROM to meet the demands of patient's activities • Good (4/5) lower extremity strength • Symmetrical DL squat to 70° of knee flex • Good quality movement as graded on Forward Step Down Test (Appendix A) • Normalized gait pattern for community distances of ambulation 	



Phase III: Pain Free ADLs to Return to Recreational Activities (12-20 wks)

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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Avoid sacrificing quality for quantity during strengthening • Avoid hip flexor/adductor inflammation as activity increases • Ensure patient maintains full flexibility and painfree ROM as strength continues to increase • Avoid aggressive stretching within this phase unless significant hypomobility noted • Closely monitor return to sport progression
ROM/ Stretching	<ul style="list-style-type: none"> • ROM should be checked periodically to ensure that loading the hip with new exercises does not alter neuromuscular response and normal joint mechanics • If full ROM is not achieved by week 12, terminal stretches should be initiated
Therapeutic Exercise	<ul style="list-style-type: none"> • Continue progressive LE/core strengthening: Slow to fast, simple to complex, stable to unstable, low 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 multi-planar movements: 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
Cardio-vascular Exercise	<ul style="list-style-type: none"> • Dynamic warm-up initiated • Upright Bike/Elliptical Progression (see return to biking protocol) <ul style="list-style-type: none"> • Progress resistance (and cross ramp on elliptical) as tolerated • Swimming Progression (see return to swimming protocol) <ul style="list-style-type: none"> • Can begin freestyle kick; continue to avoid rotational kicks
Plyometrics	<p>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.</p> <ul style="list-style-type: none"> • Criteria to initiate plyometric program <ul style="list-style-type: none"> • Full, functional, pain-free ROM • > 80% quadriceps, hamstring, and hip (using hand-held dynamometer) strength compared to uninvolved leg • Squat 150% BW (barbell squat or leg press) • 10 forward and lateral step downs from 8" step with proper alignment (Appendix A) • Progressive weight bearing, DL → SL demands <ul style="list-style-type: none"> • Shuttle plyometrics (DL → SL) • Forward hop and hold (uninvolved → involved) • DL mini hops/place jumps



	<ul style="list-style-type: none"> • 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
Running	<ul style="list-style-type: none"> • See appendix B (only for appropriate patients)

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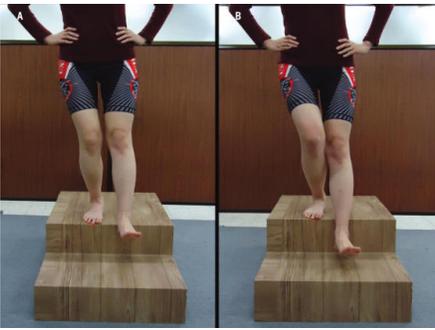
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Appendix A: Forward Step Down Test

Definition of errors	Interpretation of errors	
<p>Arm strategy: subject uses an arm strategy in an attempt to recover balance (1 point)</p> <p>Trunk movement: trunk leans right or left (1 point)</p> <p>Pelvic plane: pelvis rotates or elevates on one side compared to the other (1 point)</p> <p>Knee position: knee deviates medially and the tibial tuberosity crosses an imaginary vertical line over 2nd toe (1 point); knee deviates medially and the tibial tuberosity crosses an imaginary vertical line over medial boarder of the foot (2 points)</p> <p>Balance: subject steps down on the uninvolved side or the subject's tested leg becomes unsteady (1 point)</p>	0-1 errors	Good quality mechanics
	2-3 errors	Medium quality mechanics
	4+ errors	Poor quality mechanics

Park K, Cynn H, Choung S. Musculoskeletal predictors of movement quality for the forward step-down test in asymptomatic women. *J Orthop Sports Phys Ther.* 2013;43(7):504-510.



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Appendix B: Return to Running

Walk/jog progression can be initiated towards end of phase if patient demonstrates:

- Full, functional, pain-free ROM
- > 80% quadriceps, hamstring, and hip (using hand-held dynamometer) strength compared to uninvolved leg
- Squat 150% BW (barbell squat or leg press)
- 10 forward and lateral step downs from 8" step with proper alignment (see appendix D)
- Hop and hold with proper mechanics (uninvolved→involved x10 repetitions)
- Ability to tolerate 200-250 plyometric foot contacts without reactive pain/effusion
- No gross visual asymmetry and rhythmic strike pattern with treadmill or over ground running

Phase	Walk/Run Ratio	Total Time
1	4 min / 1 min	10-20 min
2	3 min / 2 min	10-20 min
3	2 min / 3 min	10-20 min
4	1 min / 4 min	10-20 min
5	<ul style="list-style-type: none">• Jog every other day until able to run 30 consecutive minutes• Begin with 5 min walking warm up• End with 5 min walking cool down	

General Guidelines

To complete each phase, follow the total time guidelines below.

- 10 minutes x2 sessions
- 15 min x1 session
- 20 min x1 session
- After completing any phase pain free for 20 minutes, patient is appropriate to move forward to next phase
- Allow at least one day of rest between runs
- Gradual increase in distance is priority before increased pace
- It is common for runners to experience increased pain and/or reactive edema at least x1 during this return to run progression. When pain occurs, runner must stop running immediately and rest at least 1 day before restarting program. With restart, perform last walk/jog ratio cycle completed pain free x2 before attempting the previously painful ratio cycle.
- Ten Percent Rule: only increase weekly mileage by 10% of the previous week

