

# TOTAL HIP ARTHROPLASTY POST-OP CLINICAL PRACTICE GUIDELINE

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 ball and socket 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. The surgeon will determine the best surgical approach to use for each individual patient. A posterior approach uses an incision curved along the posterior side of the hip behind the greater trochanter. The muscles typically cut during a posterior approach include: TFL, gluteus maximus and hip external rotator muscles. An anterior approach uses an incision that typically starts at the iliac crest and extends down toward the top of the thigh (less commonly, you will find a horizontal incision). The anterior muscles are then divided to display a window to the hip joint and muscles are typically not cut. With a direct lateral approach, it involves a detachment of a portion of the gluteus medius with repair at the end of surgery. Consideration for the partial gluteus medius repair during the lateral approach is important for initial post-operative rehabilitation. For each approach, you will find precautions outlined below that must be strictly followed the first 6 weeks post op to decrease risk of dislocation. After 6 weeks, the patient may gently move into these ranges per tolerance as they increase their return to lifestyle activities. Patients are encouraged to participate in early mobilization while adhering to precautions to improve function and limit post-operative complications.

## Disclaimer

Progression is time and criterion-based, dependent on soft tissue healing, patient demographics, and clinician evaluation. If you are working with an Ohio State Sports Medicine patient and questions arise, please contact the author by calling our office at (614) 293-2385.



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## Summary of Recommendations

<p><b>Precautions</b> (strictly adhered to first 6 weeks post op, guarded progression thereafter)</p>	<p>Anterior, anterolateral, direct lateral approach</p> <ul style="list-style-type: none"> <li>No hip extension past 20 degrees</li> <li>No hip external rotation past 50 degrees</li> </ul> <p>Posterior approach</p> <ul style="list-style-type: none"> <li>No hip flexion past 90 degrees</li> <li>No hip internal rotation or adduction past neutral</li> </ul> <p>General precautions</p> <ul style="list-style-type: none"> <li>WBAT, with use of assistive device (AD) as needed (crutches, walker)</li> <li>No crossing legs (crossing ankles OK)</li> <li>Use good bending/lifting mechanics (keep back straight and bend at knees)</li> <li>Keep hips above knees when sitting, avoid sitting in deep chairs</li> </ul> <p><b>**See surgical note for surgeon specific precautions**</b></p>
<p><b>ROM/Manual Therapy</b></p>	<ul style="list-style-type: none"> <li>Early range of motion (ROM) as tolerated within the restricted range</li> <li>Soft tissue mobilization as needed, scar mobilization once incision heals (&gt;2-3 wks)</li> </ul>
<p><b>Therapeutic Exercise</b></p>	<ul style="list-style-type: none"> <li>Proper activation and recruitment of all hip and core musculature without compensation required prior to initiating strengthening</li> <li>Neuromuscular re-education for balance and correction of faulty mechanics</li> <li>Therapeutic exercise for lower extremity strength (double and single limb)</li> </ul>
<p><b>Patient Reported Outcomes</b></p>	<ul style="list-style-type: none"> <li>Lower Extremity Functional Scale at each visit</li> </ul> <p>Consider collecting: Hip Osteoarthritis Outcome Score, Hip Outcome Score: ADL (17 items)   Sports (9 items)</p> <ul style="list-style-type: none"> <li>Performance tests: 30-Second Chair Stand Test, Gait Speed, TUG, Functional Reach Test, 6-min Walk Test</li> </ul>
<p><b>Considerations Regarding Running and Plyometrics</b></p>	<p><b>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. Patients are advised to participate in low impact exercise/activities. ***Patients considering plyometrics with the intent to resume running should consult with their physician.***</b></p> <ul style="list-style-type: none"> <li></li> </ul>
<p><b>Criteria for Return to Recreational Activities/ Discharge</b></p>	<ul style="list-style-type: none"> <li>Physician clearance at last check-up</li> <li>Strength:&gt;90% compared to uninjured LE &gt; 90% BW with SL leg press</li> <li>Demonstrate ability to simulate recreational activities</li> <li>Patient reported outcome measures: Score ≥ 90%</li> </ul>



## RED/YELLOW FLAGS

### Red Flags

Require immediate referral for re-evaluation

- Signs of DVT → *Refer directly to ED*
  - Localized tenderness along the distribution of deep venous system
  - Entire LE swelling
  - Calf swelling >3cm compared to asymptomatic limb
  - Pitting edema
  - Collateral superficial veins
- Mechanical block or clunk → *Refer to surgeon for re-evaluation*
- Reported episode of instability → *Refer to surgeon for re-evaluation*

### Yellow Flags

Require modifications to plan of care

- Persistent reactive effusion or pain following therapy or ADLs
  - *Decrease intensity of rehab interventions, continue effusion management, educate patient regarding activity modifications until symptoms resolve*

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

### Goals

- Protect healing tissue
- Pain and edema control (recommend compression garments to assist)
- DVT prevention
- Improve pain-free ROM
- Normalize muscle activation
- Ambulate independently without AD; recommend early and often ambulation
- Independent with all ADL's

### Precautions

- Anterior, anterolateral, direct lateral approach
- No hip extension past 20 degrees
  - No hip external rotation past 50 degrees
  - Caution with loading of the gluteus medius
- Posterior approach
- No hip flexion past 90 degrees
  - No hip internal rotation or adduction past neutral
- General precautions
- 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

### Criteria for Community Ambulation without AD

- Weaning from AD
- Walker → less restrictive (cane) or no device
  - 2 → 1 → 0 crutches as tolerated
- Gait Correctives
- Posterior approach: cue glute engagement
  - Anterior approach: protect anterior capsule; do not over-stride or move into extension beyond what is needed for normal gait (5-10 degrees)
- Encourage frequent, short bouts of walking to promote confidence with early post-op ambulation



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	<p>Criteria for community ambulation without AD:</p> <ul style="list-style-type: none"> <li>• Adequate hip ROM for normalized/pain-free gait pattern (10 degrees hip extension)</li> <li>• 20 secs of single leg stance (SLS) without compensation (hip drop, trunk lean) or pain</li> <li>• Normalized gait pattern without assistive device</li> </ul>	
<b>ROM/ Stretching</b>	<p><u>Anterior, anterolateral, direct lateral approach</u></p> <ul style="list-style-type: none"> <li>• PROM → AAROM</li> <li>• Hip flexion, abduction – range per tolerance</li> <li>• Extension to 10 degrees – degree of mobility needed for ambulation without exceeding 20degree precautions</li> <li>• Biking for joint mobility – recumbent or upright bike, patient dependent</li> <li>• Prone quad stretch</li> </ul>	<p><u>Posterior Approach</u></p> <ul style="list-style-type: none"> <li>• PROM → AAROM</li> <li>• Hip flexion &lt; 90 degrees</li> <li>• Abduction, extension – range per tolerance</li> <li>• No adduction past midline</li> <li>• Upright bike for joint mobility with raised seat, caution for hip flexion staying below 90 degrees</li> </ul>
<b>Neuro-muscular Control</b>	<p><i>This section is 1<sup>st</sup> priority → do not progress to strengthening until muscle activation and isolated control is normalized</i></p> <ul style="list-style-type: none"> <li>• Glute, quadriceps, transverse abdominis, hamstrings, performed in supine or hooklying to maintain hip precautions.</li> </ul>	
<b>Therapeutic Exercise</b>	<p><u>Early Exercises</u></p> <ul style="list-style-type: none"> <li>• Isometrics – hooklying hip adduction and abduction</li> <li>• SAQ, LAQ, ankle pumps</li> <li>• Hooklying marches, heel slides</li> <li>• Bridges</li> <li>• Standing hamstring curls, marches</li> <li>• Standing 4-way hip (keeping precautions for approach used)</li> <li>• Weight shifting</li> <li>• Standing calf raises</li> <li>• Prone laying</li> <li>• Quadruped series</li> <li>• Hooklying marches and heel slides</li> </ul>	<p><u>Late Exercises</u></p> <p>Anterior, anterolateral, direct lateral approach</p> <ul style="list-style-type: none"> <li>• SLR – supine hip flexion, sidelying abduction and adduction</li> <li>• Clamshells</li> <li>• Step Ups (forward, lateral), Step Downs</li> <li>• Bridge progressions (DL→marching→SL)</li> <li>• SLS balance</li> </ul> <p>Posterior Approach</p> <ul style="list-style-type: none"> <li>• SLR – supine hip abduction, prone hip extension</li> <li>• Clamshells with pillow between knees blocking adduction</li> <li>• Step Ups (forward, lateral), Step Downs</li> <li>• Tandem and SLS balance</li> </ul>
<b>Aquatic Therapy</b>	<ul style="list-style-type: none"> <li>• With MD clearance, can begin aquatic therapy once incision is healed (~4 weeks post-op)</li> <li>• Caution required with ambulation on pool deck due to slippery surfaces</li> <li>• Focus on functional hip ROM, normalizing gait, hip/knee strengthening and stability</li> <li>• Can return to easy lap swimming (with the exception of elementary backstroke and breaststroke)</li> </ul>	
<b>Criteria to Progress to Phase II</b>	<ul style="list-style-type: none"> <li>• Normalized gait pattern for household distances without AD</li> <li>• Minimal to no reactive pain and swelling with ADLs and PT exercises</li> <li>• Muscle activation and isolation is normalized</li> <li>• SLS for &gt;20 seconds without presence of hip drop</li> </ul>	



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

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Restore full PROM and AROM</li> <li>• Progressively improve strength of the proximal hip musculature (gluteals, iliopsoas, hip rotators)</li> <li>• Normalize postural/pelvic control with DL and SL activities</li> <li>• Normalize gait at preferred walking speed for community distances</li> <li>• Tolerate ADLs without pain or limitation</li> </ul>	
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• See above (Summary of Recommendations)</li> </ul>	
<b>ROM/ Stretching</b>	<ul style="list-style-type: none"> <li>• AROM upright bike (maintain hip flexion precautions), progress to light resistance</li> <li>• Soft tissue mobilization as appropriate, particularly for anterior hip tightness with anterior approach <ul style="list-style-type: none"> <li>◦ May benefit from referral to massage therapist if patient is developing soft tissue dysfunction/irritation (commonly affects TFL, adductors, rectus femoris)</li> </ul> </li> <li>• Soft tissue irritation suggests need for regression of activities and/or exercises</li> <li>• Soft tissue and joint mobilization to achieve symmetrical PROM</li> <li>• Avoid aggressive end range stretching <ul style="list-style-type: none"> <li>◦ If full ROM is not achieved by week 12, terminal stretches should be initiated</li> </ul> </li> <li>• Continually assess patient's current activity level outside of PT</li> <li>• Ensuring sufficient and functional hip extension with ambulation</li> </ul>	
<b>Therapeutic Exercise</b>	<u>Early Exercises</u> <ul style="list-style-type: none"> <li>• Mini-squats to 70 degrees of flexion</li> <li>• Resisted side stepping (start with TB around knees)</li> <li>• SLS balance on unstable surface, EC</li> <li>• Progress 3-way SLR to standing with TB or ankle weights (steamboats)</li> <li>• Progress hip external rotation strengthening: clamshells, quadruped hydrants</li> </ul>	<u>Late Exercises</u> <ul style="list-style-type: none"> <li>• Progress closed chain strengthening exercises: leg press, increase mini-squat depth, load exercises with weight</li> <li>• SLS balance on unstable surface with perturbations</li> <li>• Progress into more hip extension with exercises and ambulation</li> <li>• Gentle hip flexor stretching starting in neutral</li> <li>•</li> </ul>
<b>Cardio-vascular Exercise</b>	<ul style="list-style-type: none"> <li>• May progress time on upright bike as tolerated <ul style="list-style-type: none"> <li>• Ensure Pt can perform 30 mins with no resistance and without symptoms prior to adding resistance</li> <li>• Decrease time to ≤15 min when adding resistance</li> </ul> </li> <li>• May begin elliptical when patient demonstrates adequate hip extension, gluteal activation, and lumbopelvic stability</li> </ul>	
<b>Criteria for Discharge</b>  (or to Progress to Phase III once MD clearance is provided)	<ul style="list-style-type: none"> <li>• Symmetrical and pain-free hip ROM to meet the demands of patient's activities <ul style="list-style-type: none"> <li>◦ If full ROM is not achieved by week 12, terminal stretches should be initiated</li> </ul> </li> <li>• Good (4/5) lower extremity strength</li> <li>• Symmetrical DL squat to 70° of knee flex</li> <li>• Good quality movement as graded on Forward Step Down Test (Appendix A)</li> <li>• Normalized gait pattern for community distances of ambulation</li> </ul>	

\*\*\*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.



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## Phase III: Pain Free ADLs to Return to Recreational Activities (12-24 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.*

### **MD clearance is required for participation in impact activities**

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Correct abnormal/compensatory movement patterns with higher level multi –planar strengthening activities</li> <li>• Optimize neuromuscular control/balance/proprioception</li> <li>• Increase volume/intensity of aerobic activities; begin to restore low impact and sport specific cardiovascular fitness</li> <li>• Initiate progressive plyometric activities (per clearance of physician)</li> <li>• Progressively return to sport or prior/desired level of function</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Avoid sacrificing quality for quantity during strengthening</li> <li>• Avoid hip flexor/adductor irritation as activity increases</li> <li>• Ensure patient maintains full flexibility and pain-free ROM as strength continues to increase</li> <li>• Avoid aggressive stretching within this phase unless significant hypomobility noted</li> <li>• Closely monitor return to sport progression</li> </ul>
<b>ROM/ Stretching</b>	<ul style="list-style-type: none"> <li>• ROM should be checked periodically to ensure that loading the hip with new exercises does not alter neuromuscular response and normal joint mechanics</li> <li>• If full ROM is not achieved by week 12, terminal stretches should be initiated</li> </ul>
<b>Therapeutic Exercise</b>	<ul style="list-style-type: none"> <li>• Continue progressive LE/core strengthening: Slow to fast, simple to complex, stable to unstable, low to high force</li> <li>• DL to SL strengthening, for leg press and other closed chain exercises</li> <li>• Progress core stability tasks with emphasis on rotational and side-support tasks (Side planks, cable crossovers, kneeling chops/lifts, plank over BOSU ball)</li> <li>• LE strengthening tasks with multi-planar movements: Emphasize core stability and hip/knee control (no valgus) during these tasks</li> <li>• Proprioception: Vary surfaces, add perturbations, include variety of positions</li> <li>• Aquatic therapy: may begin free style swimming once full ROM is achieved</li> </ul>
<b>Cardio-vascular Exercise</b>	<ul style="list-style-type: none"> <li>• Dynamic warm-up initiated</li> <li>• Upright Bike/Elliptical Progression (per PT and patient preference)             <ul style="list-style-type: none"> <li>• Progress resistance (and cross ramp on elliptical) as tolerated</li> </ul> </li> <li>• Swimming Progression (per PT and patient preference)             <ul style="list-style-type: none"> <li>• Can begin freestyle kick; continue to avoid rotational kicks (ie: breaststroke)</li> </ul> </li> </ul>
<b>Plyometrics and Running</b>	<p><b>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 in low impact exercises. Patients considering plyometrics with the intention of resuming running should consult with their physician.</b></p> <ul style="list-style-type: none"> <li>• See Appendix B (only for appropriate patients with MD approval)</li> <li>•</li> </ul>

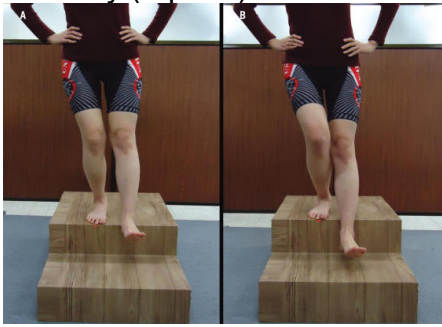


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## Appendix A: Forward Step Down Test

Definition of errors	Interpretation of errors	
<p><b>Arm strategy:</b> subject uses an arm strategy in an attempt to recover balance (1 point)</p> <p><b>Trunk movement:</b> trunk leans right or left (1 point)</p> <p><b>Pelvic plane:</b> pelvis rotates or elevates on one side compared to the other (1 point)</p> <p><b>Knee position:</b> knee deviates medially and the tibial tuberosity crosses an imaginary vertical line over 2<sup>nd</sup> 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><b>Balance:</b> 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



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## Appendix B: Return to Plyometrics and Running

<p><b>Plyometrics</b></p> <p><b>Patients considering plyometrics with intent to resume running should consult with their physician before beginning this phase.</b></p>	<p><b>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.</b></p> <p><b>Criteria to initiate plyometric program:</b>  <b>***Physician clearance at last check-up required***</b></p> <ul style="list-style-type: none"> <li>• Full, functional, pain-free ROM</li> <li>• &gt;80% quad, hamstring, glute strength compared to uninvolved LE</li> <li>• Squat 150% BW (leg press or barbell squat)</li> <li>• 10 forward and lateral step downs from 8" step with proper alignment (Appendix A)</li> <li>• Progressive weight bearing, DL to SL demands</li> <li>• Shuttle plyometrics (DL to SL)</li> <li>• Forward hop and hold (uninvolved to involved)</li> <li>• DL mini hops/jump in place</li> <li>• Proper take off/landing mechanics emphasized             <ul style="list-style-type: none"> <li>○ NO knee valgus, good pelvic stability, soft/quiet landing with equal distribution of force</li> </ul> </li> <li>• Modified agility work can be initiated if appropriate form/tolerance to activity in progressive plyometrics</li> </ul>
<p><b>Criteria for Return to Sport</b></p>	<p><b>***Physician clearance at last check-up required***</b></p> <ul style="list-style-type: none"> <li>• Strength: &gt;90% compared to uninvolved LE</li> <li>• &gt;90% BW with SL leg press</li> <li>• Demonstrates ability to simulate functional sport-specific movement</li> <li>• Patient reported outcome measures: Score <math>\geq</math> 90%</li> </ul>

**\*\*See Return to Running Program\*\***



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