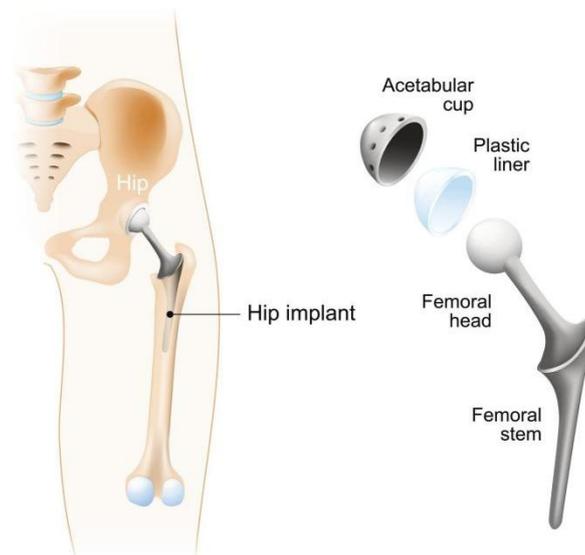


TOTAL HIP REPLACEMENT POST-OP CLINICAL PRACTICE GUIDELINE



Overview of Total Hip Arthroplasty (THA)

Total Hip Arthroplasty (THA), or total hip replacement, is an elective surgery to address pain and dysfunction in an arthritic hip joint.

Indications

THA is recommended when hip pain does not improve with conservative treatments and affects the patient's quality of life, health, or daily activities.

Procedure

Removal: The arthritic head of the femur (ball) and the acetabulum (socket) are removed.

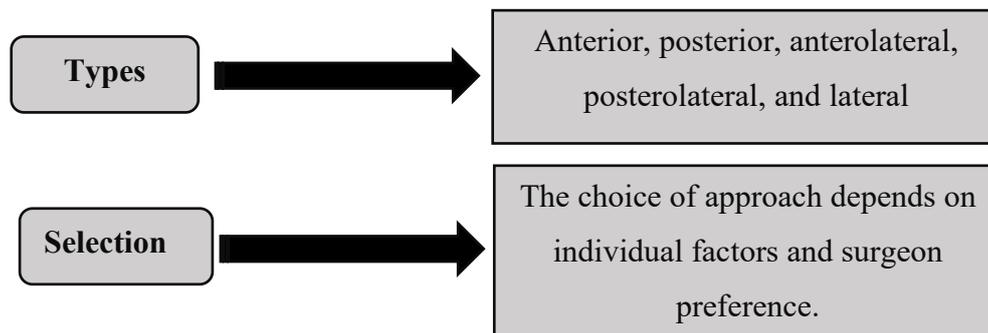
- Progression is time and criterion-based, depending on soft tissue healing, patient demographics, and clinician evaluation.
- For questions, contact Dr. Sujan Gogu's clinic.

Replacement:

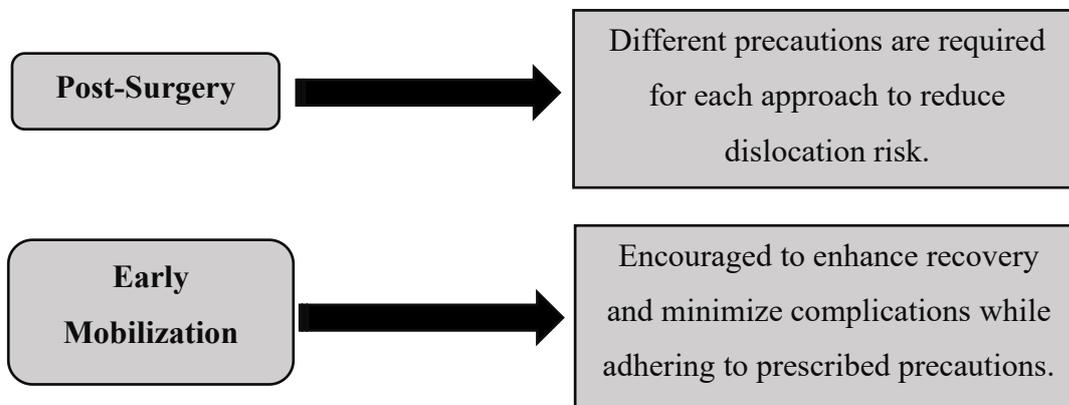
- A smooth ball with a stem is inserted into the femur.
- A metal socket with a smooth inner lining is placed in the acetabulum.

Objective: Improve hip joint function and relieve pain.

Surgical Approaches



Precautions



Recommendations

Precautions

Anterior Approach	Avoid hip extension beyond 20 degrees. Limit hip external rotation to 50 degrees
Posterior Approach	Avoid hip flexion beyond 90 degrees. Do not perform hip internal rotation or adduction beyond neutral

General Precautions

- Weight-bearing as tolerated with assistive devices (crutches, walker) if needed.
- Avoid crossing legs (crossing ankles is acceptable).
- Use proper bending/lifting techniques: keep back straight and bend at knees.
- Keep hips higher than knees when sitting; avoid deep chairs.

ROM/Manual Therapy

Start range of motion (ROM) exercises within restricted ranges as tolerated.

Use soft tissue mobilization as needed; begin scar mobilization after incision heals (2-3 weeks).

Corrective Interventions

Ensure proper activation of hip and core muscles without compensatory movements before starting strengthening exercises

Use neuromuscular re-education to improve balance and correct faulty mechanics.

Perform therapeutic exercises to build lower extremity strength (both double and single limb)

Outcome Testing

- Choose tests based on patient needs and practice setting

Patient-Reported Outcomes: VAS/NRPS, Lower Extremity Functional Scale, Hip Osteoarthritis Outcome Score, Hip Outcome Score (ADL and Sports).

Performance Tests: 30-Second Chair Stand Test, Gait Speed, TUG, Functional Reach Test, 6-Minute Walk Test.

Criteria to Initiate Plyometric Program

- High-impact activities are generally discouraged post-surgery to protect the artificial joint. Consult with a physician before starting plyometrics.

1 Full, functional, pain-free ROM

2 Strength of quadriceps, hamstrings, and hip > 80% compared to the unaffected leg

3 Ability to squat > 150% body weight on leg press.

4 Perform 10 forward and lateral step downs from an 8" step with correct form

Criteria to Initiate Running Program

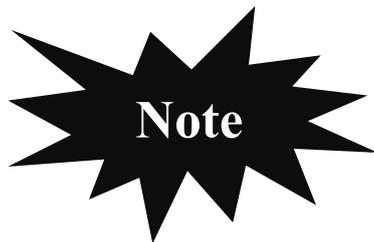
- Full, functional, pain-free ROM.
- Tolerate 200-250 plyometric foot contacts without pain or swelling.
- Perform 10 forward and lateral step downs from an 8" step with proper

technique.

- Hop and hold with correct mechanics (from uninvolved to involved side).
- Ability to squat > 150% body weight (barbell squat or leg press).
- Strength of quadriceps, hamstrings, and hip > 80% compared to the unaffected leg.
- No noticeable asymmetry or irregular running pattern.

Criteria for Return to Recreational Activities/Discharge

- Obtain physician clearance at the final check-up.
- Strength of involved hip > 90% compared to the unaffected side.
- Ability to perform single-leg press > 90% body weight.
- Demonstrate capability to simulate functional sport-specific movements.
- Patient-reported outcome measures: Score \geq 90%.



Discharge from physical therapy may be less rigorous for those not returning to sports. Ensure the patient can perform all daily activities and recreational activities without pain, swelling, or improper mechanics.

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

Goals

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

- Protect healing tissue
- Control pain and swelling (consider using compression garments/shorts)
- Prevent deep vein thrombosis (DVT)
- Improve pain-free range of motion (ROM)
- Normalize muscle activation
- Achieve independent ambulation without assistive devices (AD)
- Manage all activities of daily living (ADLs) independently

Precautions

- **Anterior Approach:** Avoid hip extension beyond 20 degrees and hip external rotation beyond 50 degrees.
- **Posterior Approach:** Avoid hip flexion beyond 90 degrees and hip internal rotation or adduction beyond neutral.

General Precautions:

- Weight-bearing as tolerated (WBAT) with AD (crutches, walker) if needed.
- Do not cross legs (crossing ankles is acceptable).
- Use proper bending/lifting techniques: keep back straight, bend at knees.
- Keep hips elevated above knees when sitting; avoid deep chairs.

Assistive Device (AD) Progression

- Progress from walker to less restrictive device (cane) or no device.
- Transition from 2 crutches to 1, then to 0 as tolerated.

Criteria for Community Ambulation Without AD

- Sufficient hip ROM for a normalized, pain-free gait pattern (at least 10° hip extension).
- Ability to stand on one leg (SLS) for 60 seconds without compensatory movements (e.g., hip drop, trunk lean) or pain.
- Achieve a normalized gait pattern without using an assistive device.

ROM/Stretching

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

- Perform pain-free passive range of motion (PROM) for hip flexion and extension; address contractures if present.
- Gentle PROM and assisted active ROM (AAROM) in supine position.
- Use an upright bike for ROM while maintaining hip flexion precautions (start with a higher seat).
- Begin soft tissue and scar mobilization once incisions are fully healed.

Neuromuscular Control

- Focus on muscle activation and isolated control before progressing to strengthening exercises
- Perform glute sets, quad sets, transverse abdominis, and hamstring exercises in supine or hook lying position to maintain hip precautions.

Therapeutic Exercise

Early Exercises:

- **Isometrics:** Hip adduction with ball/towel roll, hip abduction with belt.
- Straight leg raises (SLR), knee extension (SAQ), knee flexion (LAQ), ankle pumps.
- Standing hamstring curls and marches.
- Weight shifting and single-leg stance (SLS) to reduce dependency on AD.

Late Exercises:

- Begin once gait pattern is normalized, with minimal pain and swelling.
- SLR: Flexion, abduction, extension (only if safe; avoid extension for lateral and anterior approach until week 6).
- Step-ups (forward, lateral) and step-downs.
- Start bridge exercises.
- Perform calf raises.

Criteria to Progress to Phase II

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

- Achieve normalized gait pattern for household distances without AD.
- Minimal or no pain and swelling during ADLs and physical therapy exercises.
- Normalized muscle activation and isolation.
- Ability to perform SLS for more than 20 seconds without hip drop.

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

Goals

- Achieve full passive and active range of motion (PROM and AROM)
- Enhance strength of proximal hip muscles (gluteals, iliopsoas, hip rotators)
- Improve postural and pelvic control with both double-leg (DL) and single-leg (SL) activities
- Normalize gait at preferred walking speed for community distances
- Perform activities of daily living (ADLs) without pain or restrictions

Precautions

Follow previously outlined precautions.

ROM/Stretching

- Use soft tissue and joint mobilization to achieve balanced PROM.
- Avoid aggressive stretching at the end range.
- Perform AROM on an upright bike (maintain hip flexion precautions) and gradually increase resistance.
- Continue soft tissue mobilization as needed.
- Consider referral to a massage therapist if soft tissue dysfunction (e.g., TFL, adductors) develops.
- Address soft tissue irritation by adjusting activities and exercises.
- Regularly assess the patient's activity level outside of therapy.

Therapeutic Exercise

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

Early Exercises:

- Perform mini squats to 70 degrees of flexion.
- Engage in resisted side-stepping (start with a resistance band around knees).
- Practice single-leg stance (SLS) on unstable surfaces.
- Advance three-way straight leg raises (SLR) to standing with resistance (e.g., resistance bands or ankle weights).
- Strengthen hip external rotation.

Late Exercises:

- Increase closed-chain strengthening exercises (e.g., leg press, deeper mini squats).
- Continue SLS on unstable surfaces with added perturbations.
- Consider aquatic therapy once incision is fully healed and physician clearance is obtained, starting with controlled walking in shoulder-deep water and progressing to waist-deep water.

Cardiovascular Exercise

- Gradually increase time on the upright bike as tolerated.
- Ensure patient can ride for 30 minutes without resistance or symptoms before adding resistance.
- Reduce bike time to ≤ 15 minutes when incorporating resistance.
- Introduce elliptical training when the patient demonstrates adequate hip extension, gluteal activation, and lumbopelvic stability.

Criteria to Progress to Phase III

- Achieve symmetrical and pain-free hip ROM suitable for the patient's activities.
- Obtain good (4/5) lower extremity strength.
- Perform symmetrical double-leg squats to 70° knee flexion.
- Demonstrate good quality movement on the Forward Step Down Test.
- Normalize gait pattern for community distances.

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

Note: This phase is required only for patients aiming to participate in recreational sports. Patients not interested in sports can be discharged with a maintenance program after Phase II.

Goals

- Correct abnormal or compensatory movement patterns with advanced multi-directional strengthening exercises
- Enhance neuromuscular control, balance, and proprioception
- Increase aerobic exercise volume and intensity; start restoring low-impact and sport-specific cardiovascular fitness
- Begin progressive plyometric activities (with physician clearance)
- Gradually return to sport or previous/desired level of function

Precautions

- Focus on quality over quantity during strengthening exercises
- Prevent hip flexor/adductor inflammation as activity increases
- Maintain full flexibility and pain-free ROM as strength improves
- Avoid aggressive stretching unless significant hypomobility is present
- Monitor return-to-sport progression closely

ROM/Stretching

- Periodically check ROM to ensure new exercises do not affect neuromuscular response or joint mechanics
- Initiate terminal stretches if full ROM is not achieved by week 12

Therapeutic Exercise

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

- **Progressive LE/Core Strengthening:** Progress from simple to complex, stable to unstable, and low to high force
- Strengthen from double-leg (DL) to single-leg (SL) for leg press and other closed-chain exercises
- Enhance core stability with rotational and side-support tasks (e.g., side planks, cable crossovers, kneeling chops/lifts, BOSU planks)
- Perform multi-planar lower extremity (LE) strengthening tasks with an emphasis on core stability and hip/knee control (avoid valgus)
- Improve proprioception with varied surfaces, perturbations, and positions
- Begin aquatic therapy with freestyle swimming once full ROM is achieved

Cardiovascular Exercise

- Start with dynamic warm-ups
- Progress from upright bike to elliptical (see specific protocols)
- Increase resistance and adjust cross ramp on the elliptical as tolerated
- Begin swimming progression with freestyle kicks while avoiding rotational kicks

Plyometrics

- High-impact plyometrics are generally avoided after total joint replacements.
- Patients should focus on low-impact exercises.
- Consult with a physician before starting plyometrics or running.

Criteria to Start Plyometrics:

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

- Full, functional, pain-free ROM
- > 80% strength in quadriceps, hamstrings, and hip compared to the uninvolved leg (using hand-held dynamometer)
- Squat with 150% body weight (barbell squat or leg press)
- Complete 10 forward and lateral step-downs from an 8" step with proper alignment
- Progress from double-leg to single-leg demands
- Perform shuttle plyometrics (double-leg to single-leg)
- Forward hop and hold (from uninvolved to involved leg)
- Do double-leg mini hops and place jumps with proper takeoff/landing mechanics (avoid knee valgus, ensure good pelvic stability, and achieve soft/quiet landings)
- Initiate modified agility work if appropriate form and tolerance are demonstrated in progressive plyometrics

Appendix A: Forward Step Down Test

Error Type	Description	Interpretation of Errors
Arm Strategy	The subject uses their arms to regain balance (1 point)	
Trunk Movement	The trunk leans to the right or left (1 point)	
Pelvic Plane	The pelvis rotates or elevates on one side compared to the other (1 point)	
Knee Position	The knee deviates medially, and the tibial tuberosity crosses an imaginary vertical line over the second toe (1 point); the knee deviates medially, and the tibial tuberosity crosses an imaginary vertical line over the medial border of the foot (2 points)	
Balance	The subject steps down on the uninvolved side, or the tested leg becomes unsteady (1 point) 	

Error Interpretation:

0-1 errors: Good quality mechanics

2-3 errors: Medium quality mechanics

4+ errors: Poor quality mechanics

Reference: 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.

Appendix B: Return to Running

The walk/jog progression can begin towards the end of this phase if the patient meets the following criteria:

- Full, functional, pain-free range of motion (ROM)
- Quadriceps, hamstring, and hip strength is at least 80% of the uninvolved leg, as measured by a hand-held dynamometer
- Ability to squat 150% of body weight (using a barbell squat or leg press)
- Perform 10 forward and lateral step-downs from an 8" step with proper alignment
- Perform a hop and hold exercise with proper mechanics (uninvolved to involved leg, 10 repetitions)
- Tolerate 200-250 plyometric foot contacts without reactive pain or effusion
- No significant visual asymmetry and maintains a rhythmic strike pattern while running on a treadmill or overground

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

General Guidelines

To progress through each phase, follow the total time guidelines below:

- 10 minutes x 2 sessions
- 15 minutes x 1 session
- 20 minutes x 1 session
- Once a patient completes any phase pain-free for 20 minutes, they can move to the next phase.
- Allow at least one rest day between runs.
- Gradually increase distance before increasing pace.



It is common to experience increased pain and/or reactive swelling at least once during this return-to-running progression. If pain occurs, the runner should stop immediately and rest for at least 1 day before resuming the program. Upon restarting, repeat the last walk/jog ratio cycle completed pain-free twice before attempting the previously painful cycle.

Follow the Ten Percent Rule: Only increase weekly mileage by 10% of the previous week's distance.