

Total hip replacement (THA) post-operative protocol

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 the increasing advance in medication and research this particular surgery can be conducted in different ways. The surgeon will decide what is the best type of procedure this could be anterior, posterior, anterolateral, posterolateral, and lateral approaches. 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.

Early post-operative phase (Day 1 – 6 weeks)

Rehabilitation goals

- ❖ Protect healing tissue (stitches/wound)
- ❖ Pain and oedema control (recommend compression garments/shorts to assist)
- ❖ DVT prevention
- ❖ Improve pain-free ROM
- ❖ Normalize muscle activation
- ❖ Ambulate independently without Assistive Devices
- ❖ Independent with all ADL's (Activities of daily living)

Precautions

1. Anterior approach
 - a. No hip extension past 20 degrees
 - b. No hip external rotation past 50 degrees
2. Posterior approach

- a. No hip flexion past 90 degrees
- b. No hip external rotation or adduction past neutral
3. WBAT with the use of assisted devices as needed (crutches etc.)
4. No crossing legs
5. Use correct lifting and bending mechanics (back straight bend at the knees)
6. (Avoid deep sitting) always keep hip above the knee
7. 2-1-0 crutches as tolerated

Precautions

- **IMPORTANT: Monitor wound**
 - If you have any concerns about your wound immediately contact us on:
OS group: 0203 397 7779
 - This would include any of the below symptoms or observations;
 - wound leakage – blood or discharge
 - redness around the area
 - excessive or worsening pain
 - raised temperature

- **IMPORTANT: DVT awareness**
 - If you have any concerns that you may have developed a DVT (deep vein thrombosis) immediately contact us on this number:
 - WARD (please insert):
 - OS group: 0203 397 7779
 - This would include any of the below symptoms or observations;
 - sudden calf pain and swelling
 - pain, swelling and tenderness in one of your legs (usually your calf)
 - a heavy ache in the affected area.
 - warm skin in the area of the clot.
 - red skin, particularly at the back of your leg below the knee.

- shortness of breath and chest pain (very rare)
- **Manage swelling**
 - Cryotherapy is advised
 - **PHYSIOLAB portable S1 device** is the preferred cryo-pneumatic device of OS group. See Appendix B for contact details.
- **Reduce mobility**
 - Rest as much as possible
 - Limited walking to around the house
 - If using crutches please see appendix A for instructions on advice on their use.

Rehabilitation outline

- Gentle progressive PROM, flexion AAROM in supine
- Upright bike for ROM with increased seat height to limit hip flexion
- Soft tissue Mobilization once incision and scar are closed
- Prioritize for muscle activation before any strengthening work begins

Glute sets, quad sets, hamstrings, transverse abdominus all of which are performed in supine (must maintain hip precautions at all times).

- Isometrics in hook lying hip adduction with ball/towel roll.
- Begin weight shifting pain free to wean off of assistive devices
- SLR and ankle pumps
- Begin with short arc movements and progress to full arc

Progressive from week to week with week (5/6 weeks)

- At this stage, normalized gait patterning and minimal reactive pain and oedema
- SLR flexion and, abduction, extension at this point extension must performed in safe range. (lateral and anterior approach no extension for 6 weeks)
- Forwards and lateral step ups
- Begin bridge progression
- Calf raises

Criteria to progress to next stage of rehabilitation

- ✓ Normalized gait pattern for short distances without AD (walking around at home)
- ✓ Minimal to no reactive pain and swelling with ADLS and HEP
- ✓ Muscle activation and isolation should be normalized to Pre op level

- ✓ SLS for >20 seconds without presence of hip drop

Middle phase of Rehabilitation (Weeks 6-9)

Appointments - Rehabilitation appointment based on patient progress, around 1-2 times every week

Rehabilitation goals

- Regain muscular strength (focus on Abduction)
- Begin to restore full PROM and AROM (80%)
- Progress off of assistive device on all surfaces and distances with normal gait pattern
- Single leg stance control
- Good control and no pain with functional movements (step up, step down and squat)
- Begin to Pelvic control exercises
- Normalize gait at preferred walking speed for community distances
- Tolerate ADLs without pain or limitation

Precautions

1. Discontinue crutch or cane when gait is normal and pain free
2. Do not encourage discontinuing device if pain or Trendelenburg gait remains
3. Post activity soreness should resolve within 24hours
4. Continue to maintain traditional THA (total hip arthroplasty)
 - Patients should regain full (allowed) functional AROM through active movements at controlled speeds.
 - Avoid passive/forced movements
 - Begin with single plane, non-weight bearing movements
 - Avoid multi-planar weight bearing movements within the ROM restrictions until patient demonstrates good control with single plane movements

Rehabilitation outline

- 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)
- Stationary bike (10-20 minutes)
- Progressive hip abduction strengthening is the focus of this phase
 - Standing/side-lying abduction exercises

- Functional closed chain abduction strengthening
- Aquatic pool exercises if Trendelenburg persists

Criteria to progress to the next stage of rehabilitation

- ✓ Progression of strength particularly abduction
- ✓ Normalized gait pattern (no Trendelenburg) pain free
- ✓ Good muscular control of single limb activities
- ✓ Pain free function movements (squat step up and step downs)

Late stage of rehabilitation (9-12 weeks)

Appointments- Rehabilitation appointment based on patient progress and personal goals 1 session every 1-3 weeks.

Rehabilitation Goals

- Improve muscular strength and endurance
- Good control of movement with no pain in all activities of daily living and well as work specific movements
- Able to walk longer distances with maintained normalized gait pattern
- Symmetrical DL squat to 70° of knee flex
- Progressively improve strength of the proximal hip musculature (gluteal, iliopsoas, hip rotators)
- Normalize postural/pelvic control with DL and SL activities

Precautions

1. Post-activity soreness should resolve within 24 hours
2. No impact activities
3. No pain with ADL's if pain regress to then progress

Rehabilitation outline

- Strength and balance exercises with progression from double leg to single leg and single plane drills to multi-plane drills
- Dynamic control exercise beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities
- Progression of hip and core strengthening
- Continue ROM/stretching towards (and potentially above) 90 degrees flexion
- Soft tissue irritation suggests need for regression of activities and/or exercises
- Continually assess patient's current activity level outside of one to one session
- 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 to 15 min when adding resistance

Early stage 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 (steamboats)
- Progress hip external rotation strengthening

Later stage exercises

- Progress closed chain strengthening exercises:
- leg press, increase mini squat depth
- SLS on unstable surface with perturbations
- Hydrotherapy 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

Criteria to progress to last stage of rehabilitation

- ✓ 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° of knee flex
- ✓ Normalized gait pattern for community distances of ambulation

Last phase or rehabilitation (12-20 weeks)

Appointments – this phase is for those wanted to return to a higher level of activity or recreational sports. If the client has no desire to engage on sporting activities at recreation level or higher, they may be discharged following they have achieved all above criteria.

Rehabilitation Goals

- No compensatory movements with higher level multiplane strengthening activities
- Progressed levels of neuromuscular control, balance and proprioception
- Increased volume intensity of aerobic activities: begin to restore low impact sport specific CV fitness
- Begin on a progressive plyometric programme

- Progressively return to sport specific movements and training.

Precautions

1. Avoid changing from quality of movement to quantity (maintain good form)
2. Avoid hip flexor/adductor inflammation as activity increases
3. Ensure the patient is always pain free within full flexibility ROM
4. Strength continues to increase
5. Avoid aggressive stretching within this phase unless significant mobility is needed.
6. Closely monitor progressions

Rehabilitation outline

- ❖ Continue to progressive strengthening of core and LL
 - Simple to complex
 - Stable to unstable
 - High to low force
- ❖ Double leg exercises progress to single leg
- ❖ LL multi plane strengthening tasks with emphasis on core stability and hip/knee control (no valgus or other compensatory movements)
- ❖ Proprioception on unstable surfaces, add perturbations, include variety of positions
- ❖ Hydrotherapy - may begin free style swimming once full ROM is achieved
- ❖ ROM should be checked periodically to ensure that loading the hip with new exercises does not alter neuromuscular response and normal joint mechanics
- ❖ Progress core stability tasks with emphasis on rotational and side-support tasks (Side planks, cable crossovers, planks)

Criteria to start plyometric programme before return to sports.

- ✓ 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
- ✓ Proper take off/landing mechanics emphasized NO knee valgus, good pelvic stability, soft/quiet landing with equal distribution of force and good control
- ✓ Modified agility work can be initiated if appropriate form/tolerance to activity in progressive plyometrics

Suggested outcome measures tests to be used to monitor progression throughout the rehabilitation

1. Squat 150% BW (barbell squat or leg press)
2. SLS (single leg stance)
3. Step Down Test

Single leg Stance test

Instructions for the Patient (Eyes Open, SLS)

Stand on one leg, place your arms across your chest with your hands touching your shoulders and do not let your legs touch each other. Look straight ahead with your eyes open and focus on an object in front of you. Ideally do this with the shoes off.

Criteria to stop timing the test

The legs touched each other, the feet moved on the floor, their foot touches down, or the arms moved from their start position.


Instructions for the Patient (Eyes Closed, SLS)

Stand on one leg, place your arms across your chest with your hands touching your shoulders and do not let your legs touch each other. Close your eyes once you have gotten in position. Ideally do this with the shoes off.

Criteria to stop timing the test:

The legs touched each other, the feet moved on the floor, their foot touches down, the eyes open during the eyes closed test, or the arms moved from their start position.

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.

Appendix A - Crutches

- When standing up and sitting down, make sure you take your arms out of the crutches and hold them in one hand. This will help to avoid any shoulder injuries.
- When walking with the crutches, keep the handles pointing forwards and your arms close to your sides.
- Place both crutches forwards together with enough space in between them to step into.
- If you are advised that you are not allowed to put any weight through your injured leg (non-weight bearing), place your crutches forwards together. Now lean through your arms as you hop your uninjured leg up to the same level as the crutches. The foot on your injured leg must stay off the floor at all times when walking.
- If you are advised that you are allowed to weight bear, place the crutches forwards together and then step your injured leg up to the crutches. Now lean through your arms as you step your uninjured leg forwards to the same level.
- When climbing stairs, try to use a banister or rail in one hand and a crutch in the other (you can also carry the extra crutch in this hand):
 - GOING UP: Good leg, bad leg, crutch
 - GOING DOWN: Crutch, bad leg, good leg.
- Check the rubber stoppers regularly. If they are worn down, bring them back to the Physiotherapist will replace them.

Appendix B - Physiolab

Link for hire <https://physiolab.com/products/to-rent/s1-portable.html>

Website www.physiolab.com