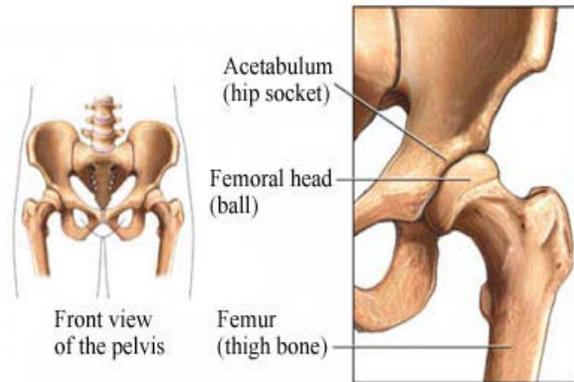


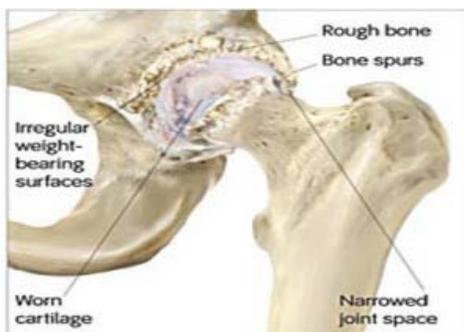
Total Hip Arthroplasty

Anatomy and Biomechanics

The hip is a ball and socket joint located where the thigh meets the pelvis. The upper end of the thigh bone (head of the femur) is formed into a ball, which sits in the socket of the pelvic bone called the acetabulum. The hip joint is a very stable joint due to the natural deep fit of the head of the femur in the acetabulum. It is also surrounded and supported by strong ligaments and muscles. Both the head of the femur and the acetabulum are covered with smooth cartilage, which allow the bones to easily glide on each other. This cartilage will naturally wear down over time creating a rougher surface with which to weight bear on. Without smooth healthy cartilage the hip also has a hard time producing the natural joint oil (synovial fluid) that lubricates the hip during movement. Collectively, these degenerative processes that happen over time lead to the condition known as osteoarthritis. This process happens naturally overtime, but can be more severe or develop quicker in some people.



<http://web.ebscohost.com/rrc/detail?sid=1>



<http://www.sonoranhipcenter.com/hip-arth1>

As degenerative changes in the hip advance, the joint becomes more and more painful and less and less mobile. Osteoarthritis typically produces stiffness in the joint and pain during weight bearing activity, especially right after a period of immobility (i.e. first thing in the morning). The pain in the joint may subside after moving around, but become worse again when standing or walking for long periods of time. As the condition of the joint deteriorates it will become harder and harder to bear weight on it and eventually the joint may lose some of its range of motion.

Treatment Options

Regardless of the nature and severity of the osteoarthritis in your hip your physician will work with you to determine what the best course of treatment will be. When degenerative changes are not severe the associated pain and dysfunction may successfully be treated with rest, anti-inflammatory measures, activity modification and physical therapy. After a thorough evaluation your physician and their staff will recommend the most appropriate course of action to take.

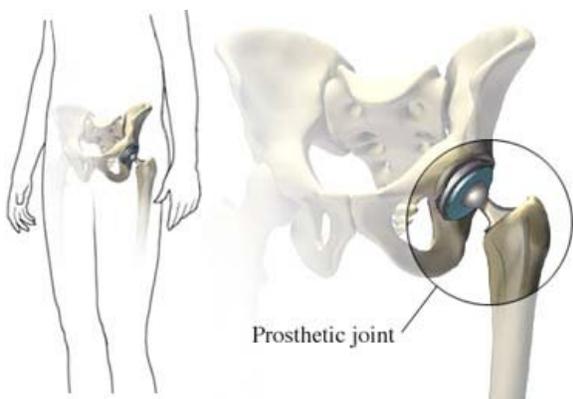
Physical therapy is often recommended for treatment of pain and dysfunction associated with osteoarthritis. The physical therapist will evaluate your mobility, flexibility and strength with the purpose of determining any underlying deficits that contribute to increased stress on the painful joint. You will be counseled on which activities you can safely continue and which should be avoided. The physical therapist will teach you exercises that will help to reduce joint stress. In most cases this will include strengthening and stretching the muscles around the hip and knee, as well as strengthening your core.

When joint degeneration is severe and conservative measures are unsuccessful in restoring function your physician may recommend a total hip replacement procedure.

Surgery

Total Hip Arthroplasty (Replacement) is a complex procedure that involves the removal and replacement of both the head of the femur and the acetabulum. First an incision is made most commonly along the side of the hip, and occasionally in front of the hip joint. Next the hip joint is exposed and the head and neck of the femur are removed. Then the acetabulum is cleaned out and replaced with a metal shell, and the femoral stem is fit into position. Your surgeon may or may not use cement to secure the stem.

Lastly, a carefully fitted “ball” is secured onto the stem and the hip is rejoined.



<http://web.ebscohost.com/rrc/detail?sid=2>

Each patient will be required to go through a pre-operative educational class which will review in detail the typical patient experience in the early phases of recovery. Total Hip Arthroplasty is not an outpatient day surgery procedure. You will be required to spend a few days in the hospital to recover. If the procedure and your early recovery

goes well you will typically be discharged in 2-3 days. Some more complex cases require a short

stay in a rehab hospital following the procedure.

Dislocation Precautions

The new prosthetic joint is not as stable as a natural hip joint. As a result, there are specific precautions you must follow after surgery which vary according to the type of incision used during your surgery:

- *Posterior Approach*→ do NOT bend your hip more than 90 degrees, do NOT rotate your hip inward, do NOT bring your hip in across your body beyond neutral (i.e. do not cross your legs), NO combinations of these motions.
- *Anterior Approach*→ do NOT move your hip backwards behind you body, do NOT rotate your hip outward, NO combinations of these motions; NO bridging (lifting your buttock of the bed when lying on your back), NO lying on your stomach, and when lying flat on your back keep hip bent at least 30 degrees.
- *Global Precautions*→ are a combination of the above precautions: do NOT bend your hip more than 90 degrees, do NOT rotate your hip inward or outward (keep your knee and toe facing forward), NO lying flat, NO lying on your stomach, and NO bridging.

You surgeon will instruct you which precautions to follow. You must observe these precautions for at least 3 months or as recommended by your surgeon.

At Home

You will likely receive home care visits from a registered nurse and a physical therapist after being discharged home. The nurse will help monitor your medical status and the physical therapist will help you work to restore mobility, strength and tolerance for activity. You should replace your post-op dressing one week after surgery, and have the nurse and physical therapist inspect your incision for signs of infection. If you have staples closing your incision they will likely be scheduled to be removed around 10-14 days after the operation. Your home care physical therapist will work with your surgeon and their staff to determine when you are ready to attend outpatient physical therapy.

Showering

You may shower after 3 days, as long as the incision is not draining. If the incision is draining try to keep it from getting wet during showering by using a water-tight dressing. It is best to use a shower bench if possible to assist with your balance.

Medication

Your surgeon will prescribe pain medicine for you after the operation. Please call the doctor's office if you have any questions regarding medication.

Driving

Your surgeon will tell you when you are ready to return to driving. Commonly, you are not permitted to drive for 6 weeks if you had your right hip replaced, and 4 weeks if you had your left hip replaced. You cannot drive while taking narcotics.

Ice

You should use ice on your hip after the operation for management of pain and swelling. Ice should be applied 3-5 times a day for 10-20 minutes at a time. Always maintain one layer between ice and the skin. Putting a pillow case over your ice pack works well for this. The home care physical therapist can help you customize a plan on how and when to best apply ice to your hip.

Post Operative Visits

Your first post-operative visit will be 10 days after the operation. At this visit you will meet with the surgeon or the physician assistant who will look at your hip range of motion and strength, examine your incision, and remove the staples. Your next visit will be around 6 weeks after the operation. At this visit you may have an X-ray taken to make sure that the hip replacement components are aligned well, and you will discuss when it will be appropriate to make an appointment to begin outpatient physical therapy. Additional follow up visits to the doctor's office will be based on your surgeon's discretion.

Weight Bearing

After surgery you are allowed to put as much weight on your operated leg as you can tolerate (unless otherwise indicated by your surgeon). You must use some form of an assistive device for at least the first six weeks after your surgery. Initially you will need to use a walker or crutches to help you walk. As your tolerance for weight bearing improves your physical therapist will transition you to walking with a cane. After six weeks you may receive clearance from your surgeon to transition off of your assistive device. Remember, proper gait pattern *must* be achieved in order to discontinue use of assistive devices.

Recovery/Time off Work

Recovering from Total Hip Arthroplasty surgery is not easy. It is very important that to realize that the recovery process is difficult and time consuming. You must be an active participant during this process, performing daily exercises to ensure there is proper return of range of motion and strength. There is a large amount of variability in the time it takes to fully recover from this procedure. It is usually estimated that it will take at least 4-6 months for the patient to feel as though he or she has completely returned to a pre-injury level of activity. Some cases may take as long as 9-12 months to make a full recovery. People with desk jobs should plan to take at least 4 weeks off from work and should have an extended absence plan in place should complications arise. People with more physical jobs that require excessive weight bearing and manual labor will likely be out of work for at least 3-6 months. **Recovery is different in each case.** Your individual time table for return to activities and work will be discussed by your surgeon during post operative office visits.

Rehabilitation

****The following is an outlined progression for rehab. Time tables are approximate and advancement from phase to phase, as well as specific exercises performed, should be based on each individual patient's case and sound clinical judgment by the rehab professional. ****

Phase 1: Post-op Phase (Day 1- Hospital Discharge)

Goals

- Control pain and swelling
- Protect healing tissue
- Begin to restore range of motion (ROM)
- Establish lower extremity muscle activation
- Restore independent functional mobility
- Educate the patient regarding their dislocation precautions

Precautions

- Dislocation precautions
- WBAT with crutches or walker unless otherwise ordered
- Screen for sensory/motor deficits
- Screen for DVT

Recommended Exercises

(All exercises performed within the patient's dislocation precautions)

Range of Motion

- Heel slides
- Ankle pumps
- Supine hip internal/external rotation

Strength

- Quad sets
- Glut sets
- Hamstring sets
- Supine hip abduction/adduction
- Long arc quads (LAQ)
- Seated hip flexion

Functional Mobility

- Bed mobility
- Transfer training
- Gait training on level surfaces
- Stair training

Positioning (when in bed)

- *Posterior Precautions:* ensure the foot of the bed is locked in a flat position
Anterior Precautions: foot of the bed is unlocked and slightly flexed.
- Use a trochanter roll to maintain hip in neutral rotation and promote knee extension
- Never place anything under the operated knee for posterior precautions.

Guidelines

Perform 10 repetitions of all exercises 3-5 times a day. Use ice after exercising for 10-20 minutes.

Phase 2: Mobility Phase (Hospital Discharge-6 Weeks)

Goals

- Begin to restore muscle strength throughout the operated leg
- Initiate proprioceptive training
- Initiate endurance training
- Normalize all functional mobility
- Demonstrate normal gait pattern with goal to wean all assistive devices at the end of this phase (if permitted by surgeon)

Precautions

- Dislocation precautions
- WBAT with crutches or walker, progressing to cane
- Monitor for proper wound healing
- Monitor for signs of infection
- Monitor for increased swelling

Recommended Exercises

(All exercises performed within the patient's dislocation precautions)

Range of Motion

- Continue with all phase 1 ROM exercises

Stretching

- Initiate gentle hamstring, gastroc/soleus, and quadriceps stretching

Strengthening

- Continue quad sets, glut sets, hamstring sets
- Continue LAQ and seated hip flexion
- Bridging
- Standing hip flexion/ abduction/ adduction/ extension
- Progress to straight leg raises (SLR), hip abduction/ adduction/ extension against gravity towards the end of this phase
- Progress to closed chain exercises including terminal knee extensions, mini-squats, step ups, and mini-lunges by the end of this phase

Proprioception

- Weight shifting activities
- Single leg stance

Functional Mobility

- Gait training with appropriate device emphasizing normal gait pattern
- Stair training with appropriate device

Endurance

- Initiate stationary biking with minimal to no resistance 3-4 weeks post-op

Guidelines

Perform 10-20 repetitions of all ROM, strengthening, and strengthening exercises 3x/day. Hold stretches for 30 seconds and perform 2-3 repetitions of each. Bike daily for 5-10 minutes if able.

Phase 3: Strengthening Phase (6-12 Weeks)

Goals

- Restore normal LE strength
- Return to baseline functional activities

Precautions

- Dislocation precautions
- Avoid high impact activities
- Avoid activities that require repeated pivoting/twisting

Recommended Exercises

(All exercises performed within the patient's dislocation precautions)

Range of Motion and Stretching

- Continue ROM exercises from phase 1 and 2 until ROM normalized

Strengthening

- Continue with phase 2 exercises adding and increasing resistance as tolerated
- Add resistance machines as appropriate including leg press, hamstring curl, and 4-way hip machine
- Emphasize eccentric control of quadriceps and hip abductors with closed chain exercises

Proprioception

- Single leg stance
- Static balance on Bosu/wobble board/foam/etc
- Add gentle agility exercises (i.e. tandem walk, side stepping, backwards walking)

Endurance

- Continue biking, adding mild to moderate resistance as tolerated
- Begin walking program

Guidelines

Perform ROM and stretching exercises once a day. Hold stretches for 30 seconds and perform 2-3 repetitions of each.

Perform strengthening exercises 3-5 times a week. Do 2-3 sets of 15-20 Reps.

Progress to biking/walking for at 20-30 minutes 3x/week for endurance.

Phase 4: Advanced Phase (12 Weeks and Beyond)

Goals

- Continue to improve strength to maximize functional outcomes
- Work with PT and MD to create customized routine to allow return to appropriate sports/recreational activities (i.e. golf, doubles tennis, cycling, hiking)

Precautions

- Dislocation precautions according to surgeon's orders
- Avoid high impact and contact sports
- Avoid repetitive heavy lifting

Recommended Exercises

(All exercises performed within the patient's dislocation precautions)

ROM and Flexibility

- Continue daily ROM and stretching exercises

Strengthening

- Continue with all strengthening exercises increasing resistance and decreasing repetitions

Proprioception

- Continue with all phase 3 exercises, increasing difficulty as tolerated.

Endurance

- Continue with walking, biking, elliptical machine programs

Functional Progression

- Activity/sport-specific training exercises

Guidelines

Perform ROM and flexibility exercises daily.

Perform strengthening and proprioception exercises 3-5x/ week, performing 2-3 sets of 10-15 repetitions.

Continue endurance program 30-45 minutes 3x/ week.

Time	Precautions	Goals	Recommended Exercises
Phase 1: Day 1 – Hospital D/C	<ul style="list-style-type: none"> Dislocation precautions WBAT with crutches or walker unless otherwise ordered Screen for DVT Screen for sensory/ motor deficits 	<ul style="list-style-type: none"> Control pain and swelling Begin to restore ROM Establish LE muscle activation Restore independent functional mobility Educate the patient regarding their dislocation precautions 	<u>ROM</u> <ul style="list-style-type: none"> Heel slides Ankle pumps Supine hip internal/external rotation <u>STRENGTH</u> <ul style="list-style-type: none"> Quad/glut/hamstring sets Supine hip abduction/adduction LAQs Seated hip flexion <u>FUNCTIONAL MOBILITY</u> <ul style="list-style-type: none"> Bed mobility Transfer training Gait training with appropriate assistive device on level surfaces Stair training <u>POSITIONING (when in bed)</u> <ul style="list-style-type: none"> <i>Posterior Precautions:</i> ensure the foot of the bed is locked in a flat position <i>Anterior Precautions:</i> foot of the bed is unlocked and slightly flexed Trochanter roll to maintain hip neutral rotation and promote knee extension Never place anything under the operated knee for posterior precautions
Phase 2: Hospital D/C – 6 weeks	<ul style="list-style-type: none"> Dislocation precautions WBAT with crutches or walker, progressing to cane Monitor for proper wound healing Monitor for signs of infections Monitor for increased swelling 	<ul style="list-style-type: none"> Begin to restore muscle strength throughout the operated leg Initiate proprioceptive training Initiate endurance training Normalize all functional mobility Demonstrate normal gait pattern with goal to wean all assistive devices at the end of this phase (if permitted by surgeon) 	<u>ROM</u> <ul style="list-style-type: none"> Continue with all phase 1 exercises <u>Joint Mobilizations and Stretching</u> <ul style="list-style-type: none"> Initiate hamstring, gastroc/soleus, and quadriceps stretching <u>Strengthening</u> <ul style="list-style-type: none"> Quad/glut/ham sets Continue with LAQ and seated hip flexion Standing hip flexion/ abduction/ adduction Progress to SLRs, hip abduction/ adduction/ extension against gravity towards the end of this phase Progress to closed chain exercises (TKEs, mini-squats, step ups, mini-lunges) by the end of this phase <u>Proprioception</u> <ul style="list-style-type: none"> Weight shifting activities Single leg stance <u>Functional Mobility</u> <ul style="list-style-type: none"> Gait training with appropriate device emphasizing normal gait pattern Stair training with appropriate device <u>Endurance</u> <ul style="list-style-type: none"> Initiate stationary biking with none to minimal resistance 3-4 weeks post-op

<p>Phase 3: 6-12 weeks</p>	<ul style="list-style-type: none"> • Dislocation precautions • Avoid high impact activities • Avoid activities that require repeated pivoting/ twisting 	<ul style="list-style-type: none"> • Restore normal LE strength, especially normal quad function • Return to baseline functional activities 	<p><u>ROM</u></p> <ul style="list-style-type: none"> • Continue phase 1 and 2 exercises <p><u>Strengthening</u></p> <ul style="list-style-type: none"> • Continue with phase 2 exercises, adding and increasing resistance as tolerated • Add resistance machines as appropriate (leg press, hamstring curl, 4-way hip) <p><u>Proprioception</u></p> <ul style="list-style-type: none"> • Single leg stance • Static balance on Bosu/wobble board/foam/etc • Add gentle agility exercises (i.e. tandem walk, side stepping, backwards walking) <p><u>Endurance</u></p> <ul style="list-style-type: none"> • Continue biking program, adding mild to moderate resistance as tolerated • Begin walking program
<p>Phase 4: 12 weeks and beyond</p>	<ul style="list-style-type: none"> • Dislocation precautions according to surgeon's orders • Avoid high impact, and contact sports • Avoid repetitive heavy lifting 	<ul style="list-style-type: none"> • Continue to improve strength to maximize functional outcomes • Work with PT and MD to create customized routine to allow return to appropriate sports/ recreational activities (i.e. golf, doubles tennis, cycling, hiking) 	<p><u>ROM</u></p> <ul style="list-style-type: none"> • Continue daily ROM and stretching exercises as needed <p><u>Strengthening</u></p> <ul style="list-style-type: none"> • Continue with all strengthening exercises increasing resistance and decreasing repetitions <p><u>Proprioception</u></p> <ul style="list-style-type: none"> • Continue with all phase 3 exercises, increasing difficulty as tolerated <p><u>Endurance</u></p> <ul style="list-style-type: none"> • Continue with walking, biking, elliptical machine programs <p><u>Functional Progressions</u></p> <ul style="list-style-type: none"> • Activity/sport-specific training exercises

*Reviewed by Michael Geary, MD