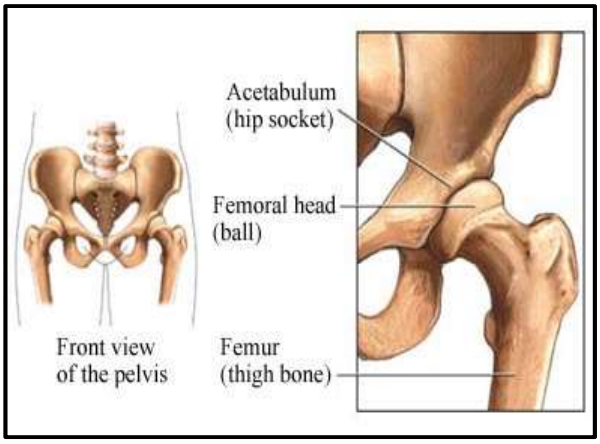
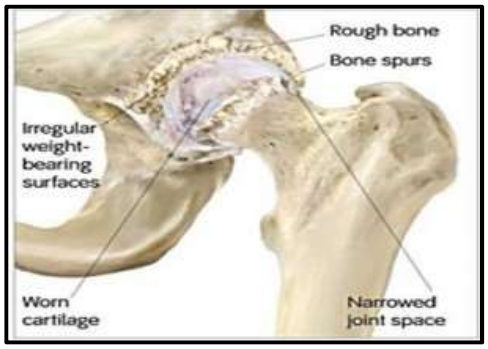
Total Hip Arthroplasty (THA) Rehabilitation Protocol

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 in the shape of 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-arth 1

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

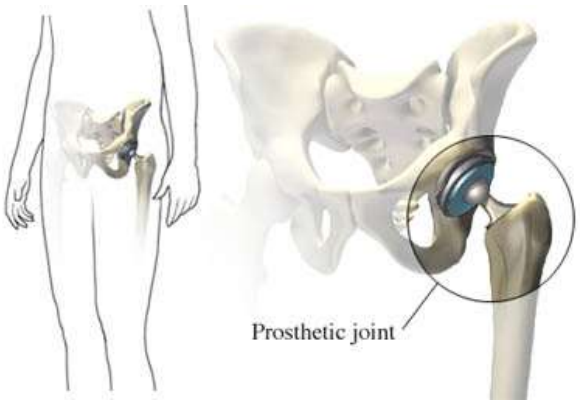
Regardless of the nature and severity of the osteoarthritis in your hip your physician will work with you to determine what the best course of treatment will be. When degenerative changes are not severe the associated pain and dysfunction may successfully be treated with rest, anti-inflammatory measures, 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 back or side of the hip. 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 polyethylene (plastic) liner, and the femoral stem is fit into position. Your surgeon may or may not use cement to secure the stem. Lastly, a carefully fitted ceramic "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. Some physicians require an appointment with your dentist to ensure there are no active dental problems. Issues such as dental infection may affect the results of your surgery. Many patients will also be required to see their primary care physician prior to surgery.

After surgery you will spend 1-2 days in the hospital. You will be out of bed the same day as your surgery. You will be working with physical and occupational therapy on a daily basis in the hospital. Most patients are discharged directly home and will have VNA services come to their house. Some more complex cases may require a short stay in a rehab facility following hospital stay.

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 leg in across your body beyond neutral (i.e. do not cross your legs), NO combinations of these motions.
- *Anterolateral Approach*→ do NOT swing your leg out to the side, do NOT bring your leg in across your body beyond neutral (i.e. do not cross your legs), do NOT move your leg backwards behind your body, do NOT rotate your hip outward, NO combinations of these motions
- *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. Your surgeon will determine the timeframe for how long these precautions will be in place.

Home Visits

You will likely receive home care visits from a registered nurse, physical therapist, and occupational 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. Your home care physical therapist will work with your surgeon and their staff to determine

when you are ready to attend outpatient physical therapy. If necessary, this would typically be around 5-6 weeks from your operation.

Surgical Incision/Dressing
You will have a dressing placed on your hip after surgery which will remain in place for 1 week. If you have staples closing your incision they will likely be scheduled to be removed, and replaced with steri-strips, around 10-14 days after the operation. Allow the steri-strips to fall off on their own or to be removed at your next doctor's office visit. If your surgeon used glue to close the wound do not remove it and it will gradually fall off approximately 1 month after surgery.

Showering
You may shower with the post-op dressing immediately. After the dressing is removed you may shower 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 for safety.

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. As time goes on you will require less and less pain medication. Your goal should be to switch from a narcotic medication to an over the counter pain medication as soon as you are able.

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.

Elevation
Elevating your lower extremity periodically throughout the day can help reduce swelling. It is recommended that you elevate your operative leg 3 to 4 times a day for 30 minutes. To elevate properly make sure to lie flat on your back and have your operative leg in a fully straightened position with your foot above the level of your heart. You may use ice and elevate your leg at the same time.

Ice
You must use ice on your hip after the operation for management of pain and swelling. Ice should be used consistently throughout the day while in the hospital. Once home, taper down to applying ice to 3-5 times a day for 10 to no more than 20 minutes at a time, typically after exercise. 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 knee.

Post Operative Visits
Your first post-operative visit will be as early as 10 -14 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. Should you have any cause for concern prior to your first office visit you should call your surgeon's office for advice. 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.

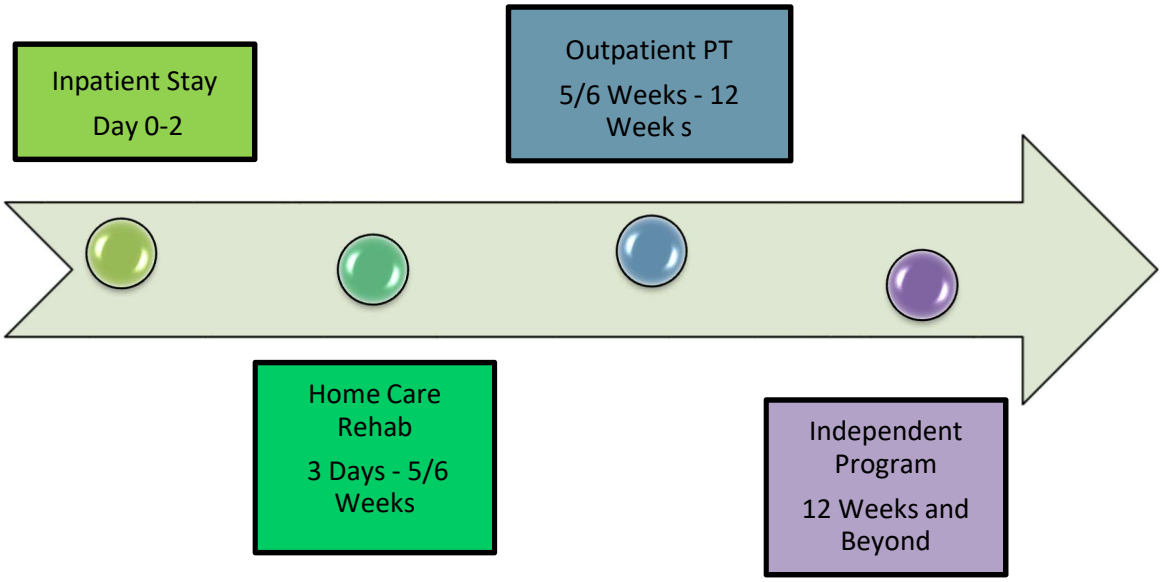
Weight Bearing

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.

Typical Rehabilitation Continuum Time Frames Following THA:



Outpatient Discharge Criteria

You are ready for discharge from outpatient PT typically when you reach 70-80% functional level compared to before surgery. This can vary greatly based on your prior level of function. Some criteria may include:

- Walking normally without any assistive device
- Negotiate stairs reciprocally and safely
- Getting in/out of a car without difficulty
- Donning/doffing shoes and socks without difficulty

Being discharged from PT does NOT mean that you are exempt from you home exercise program. For optimal outcome after surgery, it is important to continue with your specific program designed by your PT.

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 0- 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, symptomatic orthostatic hypotension, symptomatic low hematocrit

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
- Short arc quads (SAQ)

Functional Mobility

- Bed mobility
- Transfer training
- Gait training on level surfaces
- Stair training
- ADL's with adaptive equipment as needed

Positioning (when in bed)

- *Posterior Precautions*: ensure the foot of the bed is locked in a flat position
- Use a trochanter roll to maintain hip in neutral rotation and promote knee extension
- Never place anything under the operated knee for posterior precautions.
- Use of abduction wedge when in bed at all times unless otherwise ordered

- Use of hip chair (posterior approach) when appropriate

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

Inpatient Plan of Care
Day of Surgery
- Out of bed to a chair

Post Op Day 1
- PT and OT Evaluations
- Therapeutic Exercise including ROM, Strengthening, and Functional Mobility as appropriate
- ADL Training as appropriate

Post Op Day 2-Discharge
- Progression of Therapeutic Exercise and Functional Mobility
- Continued ADL Training

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 unless otherwise ordered
- 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 (within precautions)
Phase 1: Day 1 – Hospital D/C	• Dislocation precautions • WBAT with crutches or walker unless otherwise ordered • Screen for DVT • Screen for sensory/ motor deficits	• Control pain and swelling • Begin to restore ROM • Establish LE muscle activation • Restore independent functional mobility • Educate the patient regarding their dislocation precautions • Out of bed to chair day of surgery	<u>ROM</u> • Heel slides • Ankle pumps • Supine hip internal/external rotation <u>STRENGTH</u> • Quad/glut/hamstring sets • Supine hip abduction/adduction • LAQs • SAQs • Seated hip flexion <u>FUNCTIONAL MOBILITY</u> • Bed mobility • Transfer training • Gait training with appropriate assistive device on level surfaces • Stair training <u>POSITIONING (when in bed)</u> • *Posterior Precautions*: ensure the food of the bed is locked in a flat position *Anterior Precautions*: food 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	• Dislocation precautions • WBAT with crutches or walker, progressing to cane • Monitor for proper wound healing • Monitor for signs of infections • Monitor for increased swelling	• 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> • Continue with all phase 1 exercises <u>Joint Mobilizations and Stretching</u> • Initiate hamstring, gastroc/soleus, and quadriceps stretching <u>Strengthening</u> • 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> • Weight shifting activities • Single leg stance <u>Functional Mobility</u> • Gait training with appropriate device emphasizing normal gait pattern • Stair training with appropriate device <u>Endurance</u> • Initiate stationary biking with none to minimal resistance 3-4 weeks post-op

Phase 3: 6-12 weeks	• Dislocation precautions • Avoid high impact activities • Avoid activities that require repeated pivoting/ twisting	• Restore normal LE strength, especially normal quad function • Return to baseline functional activities	ROM • Continue phase 1 and 2 exercises Strengthening • Continue with phase 2 exercises, adding and increasing resistance as tolerated • Add resistance machines as appropriate (leg press, hamstring curl, 4-way hip) 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 program, adding mild to moderate resistance as tolerated • Begin walking program
Phase 4: 12 weeks and beyond	• Dislocation precautions according to surgeon's orders • Avoid high impact, and contact sports • Avoid repetitive heavy lifting	• 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)	ROM • Continue daily ROM and stretching exercises as needed 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 Progressions • Activity/sport-specific training exercises