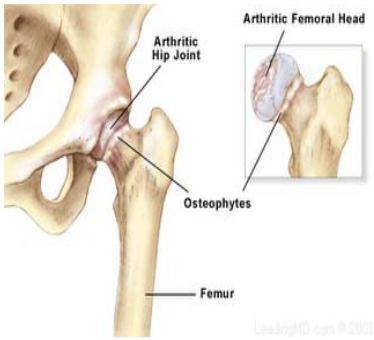
South Shore Hospital

Orthopedic, Spine and Sports Therapy

Hip OA

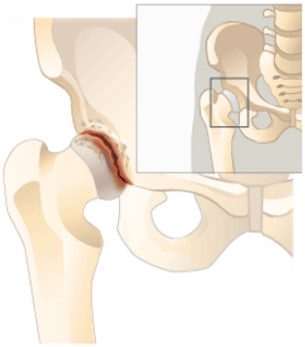
Anatomy and Biomechanics

The hip is a ball and socket joint that occurs between the head of the femur (ball) and the acetabulum of the pelvis (socket). It is surrounded by several layers of musculature and ligaments. Osteoarthritis (OA) is commonly known as "wear-n-tear arthritis", which occurs along the protective cartilage located at the surface of the joint, in this case, the head of the femur and the acetabulum of the pelvis. This protective cartilage wears away, leaving the bone exposed.



As we age, the water content of the cartilage increases, and the protein makeup of cartilage degenerates. Eventually, cartilage can further degenerate by chipping or forming tiny crevasses through repetitive use. Osteoarthritis occurs when there is a loss of the cartilage cushion between the bones of the joints. Over the years the worn joints can become irritated and inflamed, causing pain and swelling. Continued loss of cartilage will reduce the cushion and cause friction between the bones, leading to pain and limitation of joint mobility. This process also stimulates new bone outgrowths (spurs, also referred to as osteophytes) to form around the joints. Regardless of the specific mechanism of how arthritis develops in the hip, common signs and symptoms include:

Hip Osteoarthritis



- Pain in the joint during or after movement
- Tenderness with slight pressure
- Stiffness most noticeable in the morning and/or after long periods of inactivity
- Inability to move the joint through full ROM (range of motion)
- May hear grinding/grating sensation with use of the joint
- May develop bone spurs.

The muscles surrounding the arthritic hip often become weak and atrophied. There is often a reduction in the reflexive inhibition (muscle's ability to relax after being flexed or when not in use) and maximal force output of the muscles around the hip as well. The sensitivity of the muscles' proprioceptors also diminishes, limiting the ability to detect and report information to the brain. The hip's stability then becomes compromised, as the muscles become less able to react in response to changes in stimuli. These changes ultimately result in significant restrictions in activity and mobility, which reduce quality of life.

Treatment Option

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

Rehabilitation Philosophy

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. Your treatment may also include manual techniques that are designed to improve the mobility of the hip joint and reduce pain.

Rehabilitation

****The following is an outlined progression for rehab. 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 (Inflammatory Phase)

Goals

Control pain and inflammation
Begin pain free range of motion (ROM) and flexibility exercises
Establish pain free hip ROM

Recommended Exercises

<u>Range of motion and flexibility</u>

- Heel Slides
- Supine Hip Internal/External Rotation
- Gentle Bridging
- Gentle Lower Extremity Stretching (based on individual assessment)
  - Gluteus maximus
  - IT Band/ Tensor Fascia Latae (TFL)
  - Hamstring
  - Hip Rotators
  - Iliopsoas /Rectus Femoris
  - Piriformis
- Gentle Cycle if Tolerated

Guidelines

Perform range of motion exercises daily. Do 2-3 sets of 15-20 Reps. Perform stretching program daily. Hold stretches for 30 seconds and perform 2-3 repetitions of each.

Phase 2 (Sub-acute Phase A)

Goals

Continued protection of injured joint
Continue to improve flexibility
Begin to strengthen areas of weakness/instability

Recommended Exercises

Range of Motion and Flexibility

- Cycle (slow progression of resistance)
- Continue ROM and Flexibility from Phase 1 as needed

Strength

- Begin open chain strengthening (based on strength assessment)
  - Bridging exercises
  - Straight Leg Raise (SLR)
  - Hip Abduction
  - Hip Extension
  - Hip External Rotation
  - Quadraped positional exercises
  - SLS (single leg stance)

Guidelines

Perform stretching program daily. Hold stretches for 30 seconds and perform 2-3 repetitions of each.
Cardio program should be performed no more that 3-5 times a week for 20-35 minutes.
Perform strengthening exercises daily. Do 2-3 sets of 15-20 Reps.

Phase 3 (Sub-acute Phase B)

Goals

Continue to avoid exacerbation of symptoms
Continue to maximize return of strength and flexibility
Establish closed chain strength and stability

Recommended Exercises

Range of Motion and Flexibility

- Continue cycle, may add walking
- Continue lower extremity stretching from Phase 1 and 2

Strengthening

- Continue progression of open chain program with ankle weights
- Can add gym equipment (Leg Press, Multi-Hip, Cable Column Posterior Depression)
- Pain free closed chain hip strengthening
- Continued progression with SLS activities
- Continued progression with bridging exercises (Physioball, Foam Roll)
- Step Up Progressions (forward and Lateral)

Guidelines

Perform stretching program daily. Hold stretches for 30 seconds and perform 2-3 repetitions of each.
Cardio program should be performed no more that 3-5 times a week for 20-45 minutes.
Perform strengthening exercises 3 times a week. Do 2-3 sets of 15-20 Reps.

Phase 4 (Return to sport/Activity Phase)

Goals

Continue to avoid hip overload
Progress with single leg strengthening
Achieve adequate strength and flexibility to return to activity

Recommended Exercises

Flexibility

- Continue daily stretching

Cardio

- Continue cycle, walking
- Return to running/sport progression (outlined by physician or physical therapist)

Strengthening

- Continue SLR/Open Chain program and gym equipment progression
- Static lunge with progression to dynamic
- Lateral lunge progressions
- Progressive single leg strengthening (single leg squat, single leg dead lift, single leg ER)

Return to Sport

- Work with physician or physical therapist to outline progressive return to sport

Guidelines

Perform stretching program daily. Hold stretches for 30 seconds and perform 2-3 repetitions of each.
Cardio program should be progressed in preparation for return to sport.
Perform strengthening exercises 3 times a week. Do 2-3 sets of 15-20 Reps

Phase	Emphasis	Recommended Exercises	Guidelines
Phase 1 Acute Phase	*Control Pain and Inflammation *Re-establish Normal ROM *Begin Pain Free Flexibility Program *Manual Therapy	**ROM and Flexibility** Cycle (if pain free motion) Heel Slides (in pain free arc) Supine Hip Rotation Supine Bridge Lower Extremity Stretching • Rectus Femoris/Iliopsoas • IT Band/TFL • Hamstring • Hip Rotators • Piriformis • Gluteus Maximus *based on individual assessment	*ROM Daily 2-3 sets of 15-20 Reps *Stretching Program Daily 2-3 Repetitions of 30 Seconds
Phase 2 Sub-acute Phase A	* Continued Protection of Injured Joint *Continue to Improve Flexibility *Begin to Strengthen Areas of Weakness/Instability	**ROM and Flexibility** Cycle (slow progression of resistance) Continue ROM and Flexibility From Phase 1 **Strength** Begin Open Chain Strengthening • Bridging exercises • Quadraped positional exercises • Straight Leg Raise • Hip Abduction • Hip Extensors • Hip Rotators • SLS (single leg stance) *based on individual assessment	* Stretching Program Daily 2-3 Repetitions of 30 Seconds *Cardio program should be performed no more that 3-5 times a week for 20-35 minutes. *Perform strengthening exercises daily 2-3 sets of 15-20 Reps
Phase 3 Sub-acute Phase B	* Continue to Avoid Exacerbation of Symptoms *Continue to Maximize Return of Strength and Flexibility *Establish Closed Chain Strength and Stability	**ROM and Flexibilty** Continue Lower Extremity Stretching from Phase 1 and 2 Continue cycle, may add walking **Strengthening** Progress OKC Program with Ankle Weights Can Add Gym Equipment Step Up Progressions (Forward Step Ups, Lateral Step Ups) Pain Free Closed Chain Hip Strengthening Continue progression with SLS activities Continue progression with bridging exercises	* Stretching Program Daily 2-3 Repetitions of 30 Seconds *Continue to Stress Proper Gait * Cardio program should be performed no more that 3-5 times a week for 20-45 minutes. *Perform strengthening exercises 3 times a week 2-3 sets of 15-20 Reps.
Phase 4 Sport Specific Phase	* Continue to avoid hip overload *Progress with single leg strengthening *Achieve adequate strength and flexibility to return to activity	**Flexibility** Continue daily stretching **Cardio** Cycle, walking, elliptical machine Begin return to running progression per MD **Strengthening** Continue OKC program Continue gym equipment progression Continue step-up progressions (lateral step-ups, cross over step-ups) Static lunge with progression to dynamic Lateral lunge progressions Progressive Single Leg Strengthening (single leg squat, single leg ER, single leg dead lift) **Return to Sport** Outlined by PT or MD	* Stretching Program Daily 2-3 Repetitions of 30 Seconds *Cardio program should be progressed in preparation for return to sport. *Perform strengthening exercises 3 times a week. Do 2-3 sets of 15-20 Reps

***Reviewed by Michael Geary, MD**