



## TOTAL HIP REPLACEMENT

Total Hip replacement is usually needed when the normally smooth, slippery soft joint surface cartilage wears down to rough bone (degenerative arthritis or osteoarthritis).

One or more of several *patterns of pain* are typically present before any person is willing to accept having their hip replaced:

1. **Severe pain at rest.** Sitting or lying down does not sufficiently relieve the pain.
2. **Inability to walk a block.** If someone cannot get out of the house, or go to the store, many people will choose to have their hip replaced.
3. **Repeated giving way** of the leg, sometimes causing falls or risking other injuries.
4. **Severe loss of motion** of the hip (stiffness) and a painful sensation of grinding (crepitus) which causes marked limping, fatiguing, and straining of the back. Stiffness and crepitus make sitting, transitioning from sitting to standing, and straining with the hip extremely painful and difficult.

**X-rays** commonly demonstrate loss of joint cartilage space (**bone on bone** arthritis). Bone spurs, bone cysts, loss of roundness of the ball of the hip are commonly seen on x-rays when someone needs a hip replacement.

**Non-surgical measures** to treat hip arthritis include:

1. **Arthritis medicines (NSAIDS)** such as aspirin, ibuprofen (Advil, Motrin, Nuprin) naproxen (Aleve), Relafen or Mobic. Tylenol is the safest pain medicine for arthritis. These arthritis medicines take effect in minutes to hours.
2. **Glucosamine** (1.5 gm/day) and **chondroitin sulfate** (1.2 gm/day) are food supplements (no prescriptions) which can help arthritis symptoms, but may take 2 months for any noticeable improvement.
3. Use of a **cane**, especially in the opposite hand of the arthritic hip.
4. **Weight loss.** Imagine carrying a 50 pound backpack all day, that is what your body feels when you put on 50 pounds of unnecessary weight.
5. **Activity restrictions.** Don't do the activities which worsen your pain. Especially avoid high impact or high strain activities.
6. **Low impact exercises** such as water aerobics, stationary bike or elliptical exerciser.
7. **Cortisone injection** is most effective when the symptoms are severe and the duration of symptoms is short. Cortisone is least likely to work with severe x-ray abnormalities and chronic (over several months) pain. Cortisone simply decreases severe inflammation. Multiple cortisone injections within a short period of time will accelerate progression of arthritis. In diabetics, blood sugars can rise significantly for 2-3 days after an injection.

Hip replacements are composed of varying materials depending on which company makes them and the technique chosen by the surgeon. Good results can be

achieved with hip replacements using a variety of different techniques and components. **Uncemented (bone ingrowth) components** may provide better durability (beyond 15 years) than cemented total hip replacement. Uncemented total hip replacements are usually easier to revise if failure occurs, and do not generate cement wear particles. However, uncemented components take time for ingrowth of components. **Hybrid** total hip replacement usually involves both techniques. Cement is used with the femoral (thigh bone) component and uncemented cup is used for the socket component.

Hip joint bearing surfaces are most commonly:

1. **32 mm metal ball on** a wear resistant (ultra high molecular weight **highly cross-linked** polyethylene) **plastic socket**. Usually your large arthritis ball (45-55mm) is replaced with a smaller 32 mm ball. Small balls have less range of motion and are more easily dislocated. ***Most hip replacements done world wide are metal on plastic.*** Most studies suggest modern techniques of metal on plastic hip replacements show a durability rate of 80-95% implants successful at the 15 year follow-up. New highly cross-linked plastics likely will markedly improve long term durability.
2. **Large metal ball on a metal socket** provides better performance, better range of motion, and better hip stability. Metal on metal hips have not been studied as much or as long as metal on plastic. Early failures were the big problem with old metal on metal designs. *Third generation (modern) metal on metal hips have not had problems* with early failure. Concern exists about the accumulation of metal ions in the body. Cancer risk, toxicity, metal hypersensitivity, and pregnancy are concerns. **Thirty year follow-up data** from numerous sources including national data bases have **failed to show any increased cancer risk, toxicity problems, or fetal problems** related to placement of a metal on metal total hip. Long term data is not available for third generation metal on metal hip replacements, but most experts expect **superior durability** of metal on metal hips compared to metal on highly cross-linked plastic. The greatest problem with metal on metal total hips is their much higher cost.
3. **Ceramic on ceramic** has the lowest wear rate on laboratory studies. Ceramic on ceramic hips usually use an intermediate sized femoral ball. Failure by component fracture and lack of long term follow-up prevent widespread use.

For the patient, total hip replacement is far less of an operation than 10 or 20 years ago. Typically full weight bearing is allowed beginning the day of the surgery. Outpatient surgery is possible with younger patients who have a good pain tolerance. Medicare typically covers 3 days in the hospital. Discharge typically is to home. Some patients who have greater rehab needs or less support at home may choose to stay 1-2 weeks in a rehabilitation facility. Daily physical therapy is typically recommended. Physical therapy is not usually needed beyond 2-4 weeks post-op. Return to sitting work is allowed as soon as the skin is healed (about 2 weeks post-op). Alternate sit/standing work can begin about 6 weeks post-op. Full time on your feet standing work (8 hours a day) can begin in most situations 8-12 weeks post-op. Permanent restrictions are needed more often with small head replacements due to decreased range of motion and greater dislocation risk.

Problems can occur after hip replacement surgery. Infection occurs in far less than 1% of patients undergoing hip replacement. If infection occurs, removal of the

infected prostheses may be needed. Re-implantation of another hip replacement is usually possible once the infection is cleared. Dislocation risk increased with smaller head replacements (metal on plastic). Dislocation risk is less than 1% with large head metal on metal hip replacement. Dislocation risk is approximately 2-3% with small head replacements. Blood clots can occur. Rarely, a blood clot which goes to the lungs can be fatal. Many steps are taken to prevent blood clots. Blood thinner (Coumadin) is used for about 4 weeks post-op. Ankle exercises are emphasized to prevent blood flow stagnation. Calf compression boots and TED hose are used routinely. Physical therapy is begun the day of surgery.

Changes in leg length are common with hip replacement. Typically, the operated leg will feel longer than it did before replacement. Lengthening your leg may be needed to maximize the hip joint stability. Rarely, nerve injuries can occur post-operatively due to stretching of soft tissues required to dislocate and relocate the hip. Loosening of your hip replacement can occur. Loosening risk is probably greater with small metal head on plastic joints, and less likely with large head metal on metal replacements.

Pain relief is the most predictable outcome after total hip replacement. Good or excellent pain relief occurs in about 95% of patients undergoing hip replacement. Success in returning to high performance activities may be greater with large head metal on metal hip replacements.

Activity performance testing is usually done with large head metal on metal replacements beginning as soon as 6 weeks post-op. Improvement on performance test can occur up to 1-2 years post-op.

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## TOTAL KNEE REPLACEMENT

Total knee replacement is more accurately called knee *surface* replacement. The main bone, ligament, tendon and soft tissue capsule structures of the knee are not replaced. Only the painful, rough arthritic joint surfaces are replaced. Knee replacement is usually needed when the joint surface cartilage wears completely down to bone rubbing on bone.

Normal cartilage surfaces are not painful. As the protective cartilage wears away, the exposed arthritic bone becomes very sensitive and inflamed. Bone loss from bone on bone wear lead to leg bowing and leg deformity. If the bowing deformity gets severe enough, giving way of the leg or instability symptoms can occur.

**Four patterns of pain** lead most people to choose to have their knee surfaces replaced:

1. **Pain at rest** - When you cannot sleep at night or when sitting or resting does not lessen the pain to tolerable levels.
2. **Inability to walk more than a block** – Inability to leave the house, go to the store, or perform activities of daily living without excessive pain often leads to choosing replacement.
3. Falling or severe leg **giving way episodes** – Sometimes reflex leg buckling will occur causing injury. Giving way can occur from reflex muscle inhibition due to pain or from excessive bone shifting from instability.
4. **Inability to perform one's occupation** due to excessive pain or inability to stand and walk.

Using special instruments, bone is removed in the **exact size and shape** as the planned replacement surfaces. Higher levels of knee performance can only be obtained when more accurate surgery is done. Metal (cobalt-chrome and titanium) and wear-resistant plastic surfaces are rigidly fixed to bone with acrylic bone cement. The fixation with cement is usually strong enough to allow full weight bearing beginning the day of the surgery.

**Pain relief** is the single most predictable outcome of knee replacement. About 95% of patients with severe osteoarthritis will get good or excellent pain relief with knee resurfacing. Improvement with leg alignment (corrected bowing) is also very predictable. Some patients will regain lost height from correction of limb alignment. Most patients will show marked improvement with functional activities such as walking, stair climbing and rising from a chair.

Over the last 25 years, the **durability** of knee replacements has dramatically improved. Knee replacement done with someone older than age 60 can be expected to last that person's lifetime without re-operation with over 90% certainty. Our best replacements have **over 95% of implants intact at 20 year follow-up**.

Knee replacement surgery has traditionally been performed using long incisions (still often over 12 inches in length). Beginning in late 2002, the first **small incision** (4 inch incision) total knee replacement in Warsaw was performed by Dr. Jansen. The advantages of less invasive surface replacement over conventional total knee replacement are several:

1. The *main tendons moving the knee are less cut* across. Traditional knee replacement surgery requires cutting three of the four quadriceps tendons. By decreasing injury to the quadriceps, patients can begin actively using their quadriceps muscles with much less pain than was possible with standard long incisions. Long term, better kneecap stability, better leg strength, and much **better ability to kneel** and climb stairs occurs when the quadriceps are less injured.
2. Shorter surgical scar (3-5 inches) is a big cosmetic improvement over traditional 8-12 inch scars. **Plastic surgery closures** are used by Dr. Jansen to **lower infection risk** and improve scar appearance.
3. Less hospitalization – the typical stay of 3-5 days in the hospital for large incision total knee replacement can be reduced in many cases to a 2-3 day stay in the hospital.

**Complications** can occur with any joint replacement surgery. Deep **infection** is a severe problem. Removal of the infected replacement may be needed to cure the infection. Use of skin staples may increase the risk of wound infection. Numerous precautions are taken to prevent infection. “Space suits” are worn by the surgeon and staff to lower infection risk. Aggressive antibiotic therapy is used. IV antibiotics, knee wound antibiotic irrigation, and antibiotics are often mixed into the bone cement. Antibiotics are slowly released by the cement into the knee for several months after knee replacement.

**Blood clots** can occur with any leg operation. Blood clot risk is decreased several ways:

1. No tourniquet is ever used by Dr. Jansen. Tourniquets stop blood flow and increase dramatically the risk of blood clots.
2. Ankle pumping exercises increase leg blood flow and help prevent blood clots.
3. Blood thinner (Coumadin) is used for 30 days after knee replacement.

**Loosening, breakage or excessive wear** are rare problems with certain designs of joint replacement. Problems such as loosening, breakage or excessive wear are far more common if the knee replacement is not perfectly aligned. Performance of a knee replacement parallels the anatomic accuracy of placement of the knee replacement components. Small degrees of component mal-positioning can lead to markedly lower knee performance, higher rates of wear, pain and loosening. Using ideal technique in a non-complicated knee with our best knee resurfacing components, a *60 year old person who undergoes knee resurfacing surgery has over 95% chance that their knee will last their lifetime without any further surgery.* With some knee designs, all failures (3%) showed signs of failure in the first 5 years. **If no signs were present at five years after the replacement for loosening or failure, then the knee replacement never failed.**

Knee resurfacing surgery usually takes less than 2 hours. Usually a 2 to 3 day stay in the hospital is typical. Most healthy patients who have their knee replaced will go directly home from the hospital when discharged. Assistance at home is recommended for about 2 weeks. If no assistance is available at home, use of a rehabilitation facility is a good option. Daily physical therapy, use of compression boots, and nursing wound care management are advantages of these facilities.

Outpatient physical therapy averages about 3-6 weeks after knee resurfacing. Some patients have chosen to do all their therapy exercises at home without a therapist. Home exercises alone are allowed if you are making normal progress after your surgery.

Knees with poor motion before surgery usually require more therapy and are less likely to get full motion after surgery.

Many patients are able to walk without support as soon as two weeks after surgery. Less healthy and less pain tolerant patients will come along more slowly with activities. Improvement in knee function can occur up to two years after knee resurfacing surgery. Some patient with “sensitive knees” can have an ache or throb in the knee at night which can last up to 6-9 months. Typically patients are seen back in the office at 2 weeks, 4-6 weeks, 8-12 weeks, at 1 year, and every 2 years after surgery. Antibiotics are recommended with dental work procedures for 2 years after joint replacement surgeries. No follow-up is usually needed after 5 years if the joint replacement is functioning well. Occasionally, joint replacements can set off metal detectors. A card is available to notify authorities about your joint replacement.

Performance of your knee replacement parallels the accuracy with which your surgeon does the operation. High performance with a joint resurfacing surgery is most likely when the surgeon accurately removes the same amount of bone as the operation replaces. High performance knee training and testing proves that knee resurfacing does not lead to pain or disability. Permanent restrictions after knee resurfacing depend on the level of knee performance. High performance knees (score 90-100) allow some patients to return to even more heavy work than has been typically recommended. Loosening, breakage, and instability are caused by poorly placed and designed prostheses. These low performance knees will perform poorly on performance testing and require more severe work restrictions. The goals of a high performance knee are:

1. Knee flexion over 120 degrees
2. Ability to walk 2 miles
3. Low level of baseline knee pain
4. Good ability to do 10 performance tasks

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## Shoulder Arthrosis

Degeneration of the shoulder ball and socket joint (degenerative arthritis, shoulder osteoarthrosis) is a common condition which results in pain, loss of shoulder motion, and a grinding sensation (crepitus) with shoulder motion. Shoulder arthrosis (arthritis) has many causes:

- Degeneration from aging
- “Wear and tear” from stress over a lifetime
- Previous major shoulder joint surface injury
- Shoulder instability
- Excessive restriction or tightness of shoulder tissue
- Chronic large rotator cuff tears
- Inherited predisposition to joint degeneration
- Rheumatoid arthritis or other inflammatory forms of shoulder arthritis

### The signs of shoulder arthrosis:

- Loss of shoulder motion usually with loss of motion in all directions with severe cases
- Pain with shoulder motion. As the arthrosis worsens, pain can occur at rest
- Crepitus is the grinding, rubbing or popping sound heard and felt with shoulder motion. Bone on bone friction is the usual cause of the crepitus
- Weakness, particularly with heavy or overhead activity

X-rays typically show loss of joint space, bone thickening, bone spur formation, wear of joint surfaces, cysts under the joint bone surfaces, and loss of joint surface roundness.

### Non surgical treatment:

- Rest from aggravating activities.
- Gentle shoulder range of motion exercises.
- Tylenol (acetaminophen) or anti-inflammatory medicines (aspirin, ibuprofen, Advil, Motrin, naproxen, Aleve). Anti-inflammatory medicines should be taken with food and avoided if you have major kidney disease, peptic ulcer disease, or if you develop stomach irritation. Tylenol (acetaminophen) is the safest pain medicine.
- Cortisone injection is the most potent anti-inflammatory treatment. Cortisone injection is most helpful when the amount of joint inflammation is severe and the duration of symptoms is relatively short (days to weeks). The more chronic or long lasting the pain, the less likely an injection will be to produce any lasting relief. In the most severe forms of arthrosis, the injections do not relieve symptoms.

Surgical Treatment is needed when all non-surgical measures fail to control the pain.

- **Shoulder arthroscopy** can lessen pain, decrease catching, and improve function, but is *unpredictable*. Generally, the failure rate with shoulder arthroscopy treatments tends to increase with increasing age. Labral cartilage tears, inflamed joint tissue, and articular cartilage defects can be treated with arthroscopic methods. The younger the patient, the greater the potential benefits of arthroscopic treatment for shoulder degenerative arthrosis. Articular cartilage defects can potentially heal with fibro cartilage. Bone drilling or micro-fracture treatments can sometimes be helpful to produce fibro cartilage healing even in the presence of exposed bone.
- **Shoulder fusion** is the creation of bone to bone healing across the shoulder joint preventing any future ball and socket joint motion. Shoulder fusion is rarely recommended.
- **Shoulder replacement** is similar to hip or knee replacement. The joint replacement or artificial joint is a composite of metal or a combination of metal and plastic (HMW polyethylene) components used to resurface the shoulder joint. Pain relief with shoulder replacement is extremely *predictable*. Functional improvement with shoulder replacement is not as predictable. The surgery usually requires an overnight stay in the hospital. Shoulder replacement can involve a partial replacement (hemi-arthroplasty) or complete (total) shoulder replacement. Hemi-arthroplasty is replacement of the ball portion only of the ball and socket joint. Total shoulder replacement is the complete replacement of both the ball and the socket. The advantage of partial replacement is improved shoulder durability by eliminating the risk of socket loosening. The disadvantage of partial replacement is that the pain relief is often very good, but is less than what is usually seen with total shoulder replacement. Risks of shoulder replacement include: infection (less than 1%), dislocation (4%), rotator cuff tear (2%), or loosening with time. Good or excellent pain relief occurs in over 95% of cases with shoulder replacement for degenerative arthrosis.

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