What's New with Hip Replacement?
MIS (Minimally Invasive Surgery) uses smaller incisions to insert your hip replacement. The guiding principle is to minimize the soft tissue cut or injured during the surgical exposure, yet allow insertion of a similar prosthesis as is used in conventional hip replacement. When we introduced MIS Hip Surgery, we simultaneously changed the pre-operative and post-operative treatment protocols improving the patient’s comfort and speeding their ambulation, discharge from hospital as well as their overall recovery in many cases. Now that I have had a chance to critically evaluate these changes I believe that, while there are some potential advantages with smaller incisions, the major benefit to you is actually due to the altered anesthesia & pain management protocols which were developed simultaneously!
Instead of general anesthesia, we now routinely use spinal anesthesia combined with short acting sedatives and enhanced anti-nausea medications. I inject local anesthetic in the tissues during your Hip Replacement which also minimizes the need for narcotic pain relievers after surgery. The reduction in post-operative sedation and nausea combined with the marked improvement in pain relief allows a more rapid rehabilitation program and shorter hospital stay. This combination of spinal anesthesia, accelerated rehabilitation and early discharge to your home now forms the cornerstone of all types of Hip Replacement and has proven far more important in speeding your recovery than the actual length of your incisions.

What Methods of Hip Replacement are Available?

With all Total Hip Replacements, the larger muscles are split lengthwise to allow a simultaneous view of both your hip socket (pelvis) and the upper thigh bone (femur). After dividing the ligaments around the ball and socket joint, your hip is dislocated and the worn bearing surfaces are replaced with a plastic lined socket in your pelvis bone. A metal stem is fitted into your femur (thigh) bone and capped with a replacement metal or ceramic ball. Traditional Total Hip Replacement requires more extensive muscle & tendon splitting/cutting.
MIS Single Posterior Incision Hip Replacement:
This approach is basically a miniaturized version of the traditional hip replacement that can be performed through a 3” incision. With this technique, I split or divide fewer muscle fibers in order to create a small “mobile window” that is moved over your hip to access the socket and upper femur in turn allowing insertion of conventional total hip components. Visualization is sufficient to allow both press fit and cemented femoral stems when needed and so can be used for most patients.

MIS 2-Incision Hip Replacement:
This technique uses a 2” incision between the muscles on the front of your hip to allow insertion of your new socket, while a slightly smaller incision in your buttock allows insertion of the femoral stem into your thigh bone under X-ray control. The hip capsule and hip ligaments are not removed with this technique so that only minor adjustments in the length of your leg can be made. Since it is more difficult to enlarge the exposure to deal with intra-operative problems and cemented stems can not be inserted safely through this approach presently, only a very few, carefully selected patients are candidates for MIS 2-Incision hip replacement. Though I am trained in this technique, I have not seen a significantly faster recovery for these patients and it has a significantly higher reported complication rate, so I do not use it now.

MIS Anterior Supine Hip Replacement:
The Anterior Supine Hip is performed through a single 2-3” incision between the muscles on the front of your hip. Through this incision, the socket is placed similarly to the 2-Incision technique. With the use of a special Operating table, your leg can then be positioned to allow insertion of specially designed stems through the same anterior incision. As with the 2-Incision technique, the hip ligaments and capsule are not removed so adjustments in the leg length are difficult to achieve, but the hip is usually very stable after surgery and requires fewer post-operative precautions to prevent dislocation. This technique is much more difficult in obese patients or very muscular males, and carries a heightened risk of femur fracture in osteoporotic women. I have completed additional training in this technique but due to its limited applicability, I do not perform this procedure currently but expect to introduce it to Coastal Carolina Hospital in the near future.
Computer Assisted Total Hip Replacement:
Recent reports of early and unexpected hip replacement failures have refocused our attention on the position of the socket. Socket position has always been critical in preventing post-operative hip dislocation. Now it appears in many recent reports that premature wear of the implants may be due to improper orientation of the socket in your pelvis bone - leading to impingement (butting together) of the metal stem against the edge of the socket during everyday activity. This in turn may cause metal wear and leave debris within the bearing. Socket malposition is not necessarily the fault of Orthopaedic surgeons as it has been almost impossible to accurately determine the exact position of your pelvis bone (and therefore the correct orientation of the new hip socket when patients are lying on their back or on their side during surgery. Recent advances in Computerized Navigation techniques now permit me to easily & accurately measure not only the orientation of your pelvis but also help me to position your new socket correctly in the pelvic bone during your Computer-Assisted Hip Replacement. In addition, Computer Navigation also allows me to measure your exact leg lengths as well as the offset of your hip replacement before and after the components are inserted. It is expected (but not yet proven) that Computer Navigation will therefore help reduce unexpected premature wear as well as reduce post-op leg length inequality and hip instability.

The Navigation Array must be temporarily attached to your pelvic bone once you are anesthetized. This requires two ¼" incisions over the brim of your pelvic bone on the same side as your Hip Replacement Incision. After surgery, you will notice 2 additional Band-Aids covering tiny punctures - one on the opposite side of your pelvis and the second over your pubic bone. These are needed to accurately register your pelvis (telling the computer where your bone is in space) before I start the procedure. While I have considerable experience with Computer Assisted Hip Navigation software & hardware, this equipment is not currently available at our area hospitals.

What I Do Currently:
I will perform your Hip Replacement through a single posterior incision if this is your first (primary) hip replacement. Since the spinal anesthesia & multimodal analgesia post-operative protocol will have more effect on your immediate recovery than the length of your incision, I use a modest skin incision usually about 4” long but I will not hesitate to expand the dissection during surgery to accommodate unusual anatomy or to treat unexpected intra-operative findings. My primary concern is to give you the very best hip replacement possible and some patients’ anatomy or surgical problems do not allow surgery to be adequately performed with as small an incision as you might wish. Technical considerations may require that larger or additional incisions or more traditional anesthesia be utilized during your surgery. Each patient recovers at a different rate so you may find your personal initial recovery to be faster than expected or slower than others with hip replacement. Remember that our mutual goal at the outset is to replace your damaged hip with one that will give you decades of improved quality of life.
**Will I Need a Blood Transfusion?**

Although we almost never need to transfuse blood during the actual surgery, you may notice significant symptoms of anemia (fatigue, dizziness, rapid heart rate with exertion) on the first or second post-operative day. You may require transfusion if your hemoglobin level drops to critical levels. Previously we believed that low hemoglobin levels might place excess stress on our patient’s hearts and cardiovascular systems so we often transfused patients even with very modest post-op anemia in an attempt to reduce this stress. Report after report now proves that the opposite is true. Trauma patients, cardiovascular surgery patients, and heart attack patients all seem to do better without transfusions than with them (unless your hemoglobin is critically low) and recent reports show a higher wound infection rate after blood transfusion. As a result we rarely transfuse patients post-operatively unless you are having significant symptoms or there is evidence of active and ongoing bleeding after your surgery. Currently I transfuse less than 10% of my electively scheduled total hip replacement. You will be screened for anemia before surgery. If found; it is mandatory that your anemia be corrected pre-operatively by your primary care physician for your safety and to reduce your risk of blood transfusion after hip replacement.

While most patients do not make any pre-operative plans for potential blood transfusion, some of my patients feel strongly that in those rare cases where transfusion is required, they would prefer to receive their own pre-donated (Autologous) blood after surgery. You may pre-donate least one unit of blood at the Red Cross in the month before your surgery unless there are medical or personal reasons not to. Please note that there may be additional charges from the Red Cross for this service. It takes your bone marrow about a week or so to “ramp up” to full production of red blood cells to replace any blood lost. Since the Red Cross can store your pre-donated blood for only 30 days, ideally you should donate your own blood 2-4 weeks before your surgery so that your bone marrow will have time to replace it by the time you have surgery and it is unusual to pre-donate blood the week before surgery (since your bone marrow won’t have time to replace the blood). This may have a significant impact on the timing of your hip replacement. Directed donations from family members are also available through the Red Cross. These have to be arranged at the time transfusion is required and currently require approximately 7 business days to complete. My staff can give you the Red Cross phone number to get additional information about these and other transfusion-related questions.

**Scheduling Total Hip Replacement:**

The process starts once you call our office to schedule. If you have been seen by me and I have recommended hip replacement, be sure to tell the telephone receptionist that you have already seen me for this problem and wish to schedule surgery. Of course I would be pleased to meet with you to discuss any questions you may have, but in most cases, you are not required to schedule another appointment to see me before we schedule your hip replacement surgery. Be sure to tell my staff about any new medical concerns since your last visit and specify which hip and your preferred surgery dates. I will review your file personally before scheduling your procedure. You may be asked to come in for a visit or for additional X-rays to allow me to template the optimum implant for your particular needs before surgery. We appreciate your patience as we try to juggle the surgical schedule to match your particular needs.
Before Surgery:
Prior to surgery, you will need to be seen & examined by your primary care physician to ensure that you are healthy enough for hip replacement surgery. We recommend you contact your PCP as soon as you decide to proceed with surgery if you have any known health problems. This additional lead time will allow your own doctor to examine you carefully and complete any additional tests or referrals to other specialists (cardiologists etc.) so that you health is optimized before your hip replacement. Typically Faye, my assistant, will contact you and confirm your surgery date. She will also send you a copy of your surgical scheduling & consent form to read over prior to the surgery. This is your “working” copy and you do not need to bring it to the hospital. Feel free to write on it - circle or underline any areas that aren’t crystal clear- jot down any questions as you read it over. If you have made any notes on the form - call us for answers!

While waiting for surgery, be sure to plan for your return home - usually 2 days after surgery. If you have special needs or expect to be alone at home for the first week after surgery, be sure to let us know so we can make alternate discharge plans in advance. You may be interviewed by the hospital nurse by phone prior to your surgery. You will be asked to go to the hospital 1-2 weeks prior to your surgery for education classes, and to complete any blood tests, urine tests. EKG or other testing that has not already been done by your PCP. You may meet with the anesthesiologist in person during that visit.

- Be sure to specifically discuss your anesthesia concerns with your anesthesiologist prior to the day of surgery so that you understand clearly what type of anesthetic you may expect to receive.
- It is very important that you do not smoke before surgery.
- You may safely continue your arthritis medicine up to the day of surgery (even though the hospital nurse may tell you to stop it).
- If you take aspirin to prevent heart attack or stroke, be sure to continue taking it up to the day of surgery (even though the hospital nurse may tell you to stop it).
- If you take Plavix or Coumadin /Jantuven, be sure that you have received specific and written instructions from your PCP, Internist or my office at least 1 week prior to your hip replacement.
- Be sure to call my office with any questions, concerns or changes in your health or medications prior to surgery.

What is Regional Anesthesia? Will I Have To Be Awake For My Surgery?
In most cases we use a spinal anesthetic during hip replacement surgery. After you are lightly sedated, a fine needle is inserted into your back to allow injection of local anesthetic (and often a small dose of narcotic pain reliever that lasts up to 18 hours). This is usually quite painless and the needle is withdrawn immediately after the injection. Within minutes your legs will feel warm and numb and during the procedure you will feel nothing below your waist. Because you cannot feel any pain during your surgery, you may not need a deep general anesthesia or nausea-causing narcotics - your anesthesiologist may instead administer a light sedative to keep you relaxed (or more sleepy if you prefer) during your procedure. Feel free to discuss this with your anesthesiologist at the pre-operative clinic visit. Remember that this technique is not suitable for every patient. Your anesthesiologist will discuss alternative anesthesia options with you and may recommend an entirely different technique. Similarly the pre-operative preparation for spinal anesthesia permits your anesthesiologist to safely convert to general anesthesia should regional anesthesia prove suboptimal.
Will I Feel Any Pain After My Operation?
The movement usually returns to your legs while you are in the recovery room (usually within an hour or so of the procedure) but the spinal narcotic usually provides excellent pain relief through the first night. Long acting local anesthetic is injected into the incision during your procedure. Our multimodal analgesia protocol has been most effective in preventing post-op pain. Intravenous anti inflammatory pain medicine will be continued immediately after surgery and supplemented by pain pills such as Oxycodone, Hydrocodone, Tramadol or Tylenol which will be given on a regular schedule for the first few days to prevent pain. Traditional intravenous narcotics such as Morphine are always available if you still experience pain (though these are rarely needed).

When Will I Be Allowed to Walk On My New Hip?
As soon as you have regained movement of your legs, you will be allowed out of bed and encouraged to bear weight on your new hip. Your physical therapist will teach you to do this in the pre-operative clinic and on the afternoon after your surgery. Your nurse or your therapist may assist you to get in and out of bed for the first day or two. You will be encouraged to get out of bed for each meal and to walk to the bathroom as you would at home once your catheter is removed from your bladder the morning after surgery. For uncomplicated and primary (1st) Hip Replacements, you will be allowed to go home as soon as you can manage safely in your own home and walk with a cane (usually within one to two days). After revision surgery or after additional procedures you may have to protect your new hip by using a walker or crutches after surgery. You will feel confident getting around your hospital room and the Medical Surgical ward independently before you leave hospital. Many patients are able to do a simple home exercise program on their own while others may benefit from the Home Health program for a week or so. Outpatient Physiotherapy is added once you regain your independence in the community and can drive to “tune-up” the muscles long disused as a result of your hip arthritis. If you have special needs, you may require transfer to a Rehabilitation Hospital or Skilled Nursing Facility until you can manage safely at home. Our Discharge Planning coordinators will assist you in selection of the best available facility that meets your needs. Expect to use a cane when walking long distances for 4-6 weeks. You can expect to return to sedentary work in 6-8 weeks but may require 12 weeks for standing lifting & walking occupations.
When Will I Go Home After Hip Replacement Surgery?
You will be allowed to go home after Total Hip Replacement as soon as you can manage safely in your own home and walk with a cane with the occasional help of family or friends - usually on Thursday - the second day after surgery. When you first get home you will experience considerably more stiffness & discomfort due to swelling so while you may be up & about for brief periods walking, eating meals & doing your exercises but you will need to spend much of the first few days lying down with your feet elevated above the level of your heart to reduce this expected swelling.

Pool Therapy with a Physiotherapist may start the week following your surgery and helps tremendously to reduce the early swelling and stiffness and improve leg & hip flexibility. Alternatively you may access a swimming pool daily on your own as soon as your incisions have healed (usually 7-10 days after surgery). NB: the pool must have appropriate handicapped access, ladder climbing is not recommended!

Most patients complete Pool Therapy after 2-3 weeks and then continue their Home Program of walking, stretching & strengthening.

Your care will usually be transferred to Outpatient Physiotherapy at the location closest to you once you regain your independence in the community (can drive). Typically, these later sessions would develop advanced flexibility, strength & proprioception (sense of trust in your new hip) so that you may walk up & down stairs or slopes without using a cane or railing.

Other patients prefer to work with a personal trainer or resume a home gym program

Most patients do not need admission to a Rehabilitation Hospital, Skilled Nursing Facility or Home Health Services for their hip alone but may require these services because of special needs. (Typically when you go home, you are already functioning above the level where most hip replacement patients are traditionally discharged from the Home Health Physical Therapy program.)

Expect to use a cane when walking long distances for 4-6 weeks. You can expect to return to sedentary work in 4-6 weeks but may require 12 weeks for prolonged standing lifting & walking occupations

Will I Need to Go to Rehab?
If you have special needs, you may require transfer to a Rehabilitation Hospital or Skilled Nursing Facility until you can manage safely at home. Our Discharge Planning coordinators will assist you in selection of the best available facility that meets your needs..

How Long Will My Hip Replacement Last?
Although no study has long (20 year) follow-up of the exact prostheses that I currently use, we do know that most similar artificial hips have approximately a 90% survival after 10 years. At 15 years, 80-85% of hip replacements still function well. Older styles (cemented Charnley hips) have been reported in several series as functioning well up to 60% of the time even 25 years after insertion! Unfortunately, a few hips fail very early even though they appear to have been implanted correctly without complications. This means that, although your new hip replacement is expected to function for 15 years or more without any problems, there is always that small risk that it will loosen and require revision surgery within a few years of implantation.
**What Are The Risks & Complications of Hip Replacement?**

The most common complications are: leg length discrepancy, dislocation of your hip replacement, blood clots in the legs (and rarely your lungs), thigh pain and deep infection. Despite careful pre-operative planning and the use of X-Rays and repeat measurements during your surgery, most patients will have a ¼” leg-length discrepancy (on X-rays) after surgery. Most of us have up to a ½” difference in the length of our legs normally so this minor difference is not noticeable. Occasionally during surgery, the muscles & ligaments feel too loose once your new hip replacement is inserted. I then have to choose between equal leg lengths with a higher risk of hip dislocation, or lengthening your leg noticeably to tighten the soft tissues in order to reduce the risk of post-operative dislocation. I usually choose lengthening of your operated leg in this instance and may add a small shoe lift to your non-operated side if the leg lengthening is annoying once you have fully recovered.

**Blood Clots** can form in the leg of up to 70% of patients without some form of prevention after hip replacement (most of these are microscopic and cause no symptoms). Fatal pulmonary embolism (due to clot lodging in the lungs) has been reported in up to 2% of untreated patients after traditional hip replacement. Recent studies show that early mobilization after your surgery is very important in reducing the formation of blood clots. While in hospital you will have Sequential Compression Devices (SCDs) wrapped around your legs. These gently squeeze your calf muscle rapidly moving blood from your ankle past your knee every few minutes while you are in bed. These are removed when you get up. Most TED stockings do little to prevent blood clots and I no longer use them routinely. Unless you are considered at high risk for blood clots, I recommend daily Aspirin after the surgery in normal risk patients who participate actively in the rapid post-op rehabilitation program after spinal anesthesia. Be aware that the use of Aspirin combined with SCDs is an anti-coagulation protocol that is approved by the American Academy of Orthopaedic Surgeons & the American Academy of Chest Physicians for use after hip replacement but is biased towards a lower risk of bleeding complications such as infection. **If you or first degree relatives have ever had a blood clot in a leg vein or in the lung, you are a very high risk patient and should receive additional anticoagulation post-op.** Coumadin (Warfarin) pills or daily injections of blood thinners (Enoxaparin/Lovenox, Fondaparinux/Arixtra) will be prescribed for high risk patients. Please be aware that these more powerful blood thinning drugs cause a slightly higher risk of bleeding and wound infection after surgery. Coumadin requires weekly blood tests to monitor blood thinning for the recommended 4 to 6 weeks of therapy. The injections are usually continued for 14 days after surgery and do not require monitoring blood tests.

**Dislocations** occur after 5% of first time hip replacements despite every effort being made to balance the soft tissue tension and replicate the original (normal) anatomical relationships of your hip joint during your hip replacement. Usually this complication requires additional surgery to revise the orientation of the hip socket in the pelvic bone and (rarely) the stem in the thigh bone if dislocation occurs more than once.

**Intra-operative Fracture** of the thigh bone and pelvic bones bone occurs very rarely during or after Total Hip Replacement. The risk of fracture after THR is increased by the use of pins for computer navigation, Osteoporosis, Falls & Extreme Activities.
**Thigh pain** is frequent for the first month or so after your hip replacement. It usually subsides once your femur (thigh bone) gets used to the new and different loads placed on it and adapts to your increasing level of activity. Persistent thigh pain may indicate loosening of the stem or (more frequently) a mismatch between a large, stiff metal stem and the relatively flexible surrounding bone. I presently use a composite material when large stems are required. These resemble the flexibility of human bone and help reduce thigh pain. Persistent pain & swelling will also usually prompt a thorough search for occult (hidden) infection.

**Deep Infection** occurs in approximately ½-1% of hip replacements. This risk is increased by the use of blood thinners and blood transfusion after surgery. It is more frequently found in patients who smoke and those with diseases that affect our natural immunity such as Diabetes, Rheumatoid Arthritis and many other chronic illnesses. Obese patients are at significantly increased risk of both superficial & deep wound infection. Longer and more complicated operations, especially revision surgeries carry a significantly higher risk of deep infection. **If deep infection occurs, your hip replacement will need to be removed at least temporarily.** Six weeks of intravenous antibiotics are usually required before considering inserting a second hip replacement.

**General Medical Complications** occur in direct proportion to your age, health and lifestyle. My assistant will be pleased to provide you with a copy of our standard consent form for hip replacement so you can read about these general & specific risks in further detail.

**What Are My Restrictions Once Recovered from Hip Replacement?**
Since the purpose of hip replacement is to allow you to return to as active a lifestyle as possible. I encourage unlimited walking, swimming, cycling, dancing & golf. Most exercise machines are fine after surgery although I recommend lower resistance and more repetitions on weight machines (be careful to keep your knees apart). You should permanently avoid running & ball sports because of the tremendous pounding & twisting forces applied to hip replacements during these activities. You should avoid activities such as winter sports where falls are frequently encountered because of the risk of fracture adjacent to the prosthesis as these are very difficult to treat.

**Is Any Maintenance Required For My Hip Replacement?**
The American Academy of Orthopaedic Surgeons recommends a short course of antibiotics before most dental and surgical procedures for the first 2 years. My assistant will provide you with a list of the current recommendations for various procedures (which is also attached as the last page of this booklet).

Excessive wear of the polyethylene bearing surface in your prosthesis is the usual cause of loosening of total hip replacement, whereas progression of arthritis (in the un-replaced hip socket) is the mode of failure for partial hip replacement or Hip Hemiarthroplasty. **It is very important that you have your hip X-rayed and examined at least every 3-5 years to look for unusual wear even if you have no symptoms.**

If you experience unusual symptoms such as pain, swelling or a sensation that your hip “goes out of place” lasting more than a day or two, you should contact my office for an appointment rather than waiting months or years for your scheduled surveillance X-ray appointment.
Do the Newer Hips Last longer?
In most cases, loosening of your hip replacement is a direct consequence of the wearing away of the bearing surfaces with daily use. Consequently, much research is currently devoted to developing more durable Alternate Bearing Surfaces for hip replacements. These new bearing surfaces provide a significant reduction in wear rates; however, they also demonstrate significant changes in the mechanical properties of these bearing materials that may prove less desirable in hip replacement. New studies reporting intermediate (7-10) year results of these new bearings are encouraging but not yet definitive. While we are seeing substantial reductions in wear rates, there are still some concerns about both the mechanical properties of some of these hard surfaces (ceramics and newer polyethylene) as well as the allergy forming potential for some of the metal bearings. Therefore, we cannot truly say that these newer hips will last longer. At this time I use Highly Cross-linked polyethylene sockets for all total hip replacements. Depending on your age, activity level and specific clinical circumstances, I use either a traditional Chromium Cobalt (metal) ball or an alumina ceramic (Delta Biolox) ball depending on your particular circumstances.

Other Alternate Bearing Surfaces have not yet been shown to confer any significant long term advantages over our current prostheses. Despite direct to consumer ads about other benefits, presently all these are clinically unsubstantiated claims based on extrapolation of laboratory data to the clinical situation. Unfortunately there simply aren’t clinical studies with 20 or more year follow-up of our current generation of implants.
Alternate Bearing Surfaces - How Long Will My Hip Last?

Low Friction Arthroplasty:
It has been over 30 years since Sir John Charnley developed his “Low Friction Arthroplasty” now known as Total Hip Replacement. His original design used a smooth, cemented stem, a small diameter metal ball turning within a cemented, Ultra High Molecular Weight Polyethylene (UHMWPE) socket. Currently over 60% of Low Friction Arthroplasties are reported as functioning well 25 years after they were inserted!

Loosening:
You may have read that cement was bad or that cemented hips loosened earlier than “press-fit” (uncemented) hips. This has been clearly disproven! We now know that loosening of a (non-infected) hip replacement is directly related to how quickly its bearing surface wears. It seems that the microscopic particles of UHMWPE (generated by bearing wear) irritate the tissues around the hip joint. Our body’s’ natural defenses try to eliminate these tiny particles by surrounding them with host inflammatory cells. The bone anchoring & supporting the implant is then slowly replaced by inflammatory tissue (as our body tries to wall off these particles). This in turn leads to loosening of your hip replacement. Understand that our bodies do not “reject” your hip replacement itself. It is our body’s response to the microscopic wear debris particles that causes the loosening. Most studies suggest that smooth cemented implants may actually protect against loosening due to wear!

Most manufacturers have developed “new” or “improved” alternate bearing materials in an effort to reduce bearing surface wear and slow loosening so that your hip replacement will last decades. As a general rule, when we make the bearings harder and more durable, we also alter the mechanical properties which may make them more susceptible to fatigue and mechanical failure. Remember that many of these new bearing surfaces do not have clinically proven long term follow-up so decisions to use alternate bearing surfaces are essentially based on “educated guesses” as to which surface will indeed last longer without introducing a new set of problems!

Because simple changes in implant design can eliminate one problem and cause another (unanticipated) one, I continue to be very conservative in adopting new implant technologies until medium to long term clinical results prove them superior.

Metal On Metal (MoM):
Hip replacements with metal heads and sockets have been in clinical use for over 25 years. The early studies found they were either failed early or lasted for years without problems. The reason for this has recently been attributed to the poor manufacturing tolerances at that time. While we now seem to have worked out the geometry and manufacturing problems with modern metal bearings, the concerns presently are metal ion absorption into the body tissues and possible allergic reactions to the ultra-microscopic metal debris. We do have a few long terms studies of patients with these implants which show very low wear rates. Nevertheless several metal on metal hip systems have recently been largely withdrawn from the market due to higher than expected clinical failure rates due to loosening, the formation of allergy-induced soft tissue tumors around the hip replacement as well as measurably high absorption of Chromium & Cobalt ions. So far, no major adverse health issues (such as true cancers) have been reported but I remain concerned about the risks of allergic or toxic effects of these metal ions and I do not implant metal on metal bearings into my total hip replacements.
Metal On Highly Cross-linked Polyethylene:
By various combinations of pressure, heat and radiation, the UHMWPE can be made to form more links between its molecules making it stiffer and more scratch resistant. Early lab studies and short term clinical results show very low wear rates but again there are definite changes in the mechanical properties of the polyethylene. There are encouraging intermediate term studies (8-10 year follow-up) suggesting that it is well suited to Hip Replacement. We will follow the long term clinical studies with great interest. Currently I find the scientific evidence sufficiently robust to routinely use Highly Cross-linked Polyethylene bearing surfaces in all my hip & knee replacements.

Metal On Vitamin E Treated Polyethylene:
There is some preliminary evidence that treatment of Polyethylene with high doses of Vitamin E may help it last longer by reducing it’s susceptibility to oxidation/degradation while in the body. Most manufacturers now offer this option and I use it in my younger and most active patients. Its principle advantage is lower wear rates due to reduced oxidation while retaining the fracture resistant properties of UHMWPE. Stay tuned for new evidence on this material as more manufacturers bring it to market now that Metal on metal hips are no longer in favor.

Ceramic On Ceramic:
Ceramic surfaces are very hard and show very low wear rates both in the lab and long term clinical studies but, as expected, the mechanical properties are the problem here. Like your dishes at home, ceramics can chip or crack easily if they knock against metal objects during insertion or with unusual activity. There are no known ion absorption issues with ceramics. Manufacturing glitches by a single supplier caused sudden failure of several batches of ceramic heads from that particular supplier a few years ago but generally these are very rare. Though used for years in Europe, only recently have FDA approved hip replacements become available in the US where both the ball and the socket are made of ceramic materials. Though ceramics form a hard and durable bearing surface in the laboratory, in clinical use, many designs allow the metal neck of the femoral component (stem) to contact the ceramic socket at extremes of hip motion—especially if the implants are not perfectly aligned. Should this occur, the ceramic will chip or break and revision of the hip bearings will be required. As you may already know (Jack Nicklaus for example) some ceramic on ceramic implants develop an audible squeak with time.

Current Recommendations:
For older patients especially if your femoral canal is large or the bone is weak, I recommend a traditional hybrid hip replacement (cemented polished stem and a press fit socket with a highly cross-linked, UHMWPE bearing). A large diameter femoral head further reduces the risk of dislocation for older patients who may have difficulty getting in & out of chairs. For younger patients (and older patients with smaller femoral canals and strong bone) I use an uncemented (press fit) femoral stem, a press fit socket with a Vitamin E enhanced UHMWPE bearing and a smaller diameter ceramic ball to maximize wear reduction & hip longevity. In revision hip replacements, I generally use a fully coated, press fit, splined or modular revision stem and press fit revision sockets depending on the remaining host bone. Highly Cross-linked Polyethylene sockets with a large diameter metal ball help offset the much higher risk of dislocation after revision surgery.
PRECAUTIONS AFTER A TOTAL HIP REPLACEMENT - J HATCH MD FRCSC

GENERAL GUIDELINES:
• **REMEMBER TO KEEP YOUR KNEES APART WHEN CHANGING POSITIONS!**
• Follow these instructions carefully
• **These restrictions should be followed indefinitely!**
• Call my office if you are not sure about a specific activity or restriction

SITTING:
• Sit with your hips higher than your knees
• **DON’T CROSS YOUR LEGS!**
• Sit in firm chairs with arms to help you get up - avoid couches & lawn chairs!
• Don’t lean forward while sitting - cross your ankles only - don’t cross your legs!
• **KEEP YOUR KNEES APART** when getting in or out of a chair/car/toilet/bed etc.
• Straighten your knee on the operated leg, use your arms and your other leg to stand

WALKING:
• You may put your full weight on the operated leg when standing/walking
• You may use a cane in your hand opposite your new hip as soon as your balance allows
• Continue to use the cane until you can walk comfortably and without a noticeable limp
  (You will recover your hip strength faster walking with a cane than limping without it!)

SLEEPING:
• Make sure your bed is high enough so that the top of your mattress is at (or slightly above) your knees when standing beside it
• Initially the most comfortable positions for sleeping are: lying on your back or on your side
• Use a pillow between your knees when lying on the non-operated hip for 6 months
• You may sleep on your stomach once comfortable
• Plan on lying down in bed with your feet elevated for an hour or so after lunch each day to rest and to reduce leg and ankle swelling

KNEELING:
• Bend your knee on your operative leg and lower yourself onto that knee (**knees apart!**)
• Raise yourself to stand using your non-operative leg

DRIVING:
• Make sure your therapist teaches you how to safely get into & out of your car
• **Don’t take narcotics before driving**
• You may drive 1-2 weeks after hip replacement once you can climb 5 stairs almost normally
• You must be able to get in & out of your car safely and can sit comfortably for the trip duration

SELF CARE:
• **Keep your knees apart** while tending to your feet or putting on shoes, socks & stockings
• **Always avoid the “leg-shaving” position!**

SPECIFIC RESTRICTIONS: ____________________________

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Arthroscopic Surgery • Joint Replacement • Foot & Ankle Surgery • Fracture Treatment
EXERCISES AFTER HIP REPLACEMENT J HATCH MD FRCSC

Each exercise should be done 3-5 times each day so the muscles don’t tighten up. If you limp without your cane, paradoxically you are not using your buttock muscles (the limp is nature’s method of unloading the hip & gluteal muscles).

Use your cane until you no longer limp to strengthen your muscles with each step!

Isometric Buttock Strengthening
- Lie flat on a firm, comfortable surface
- Straighten both knees
- Tighten your buttock muscles on the operated side
- Hold for 5-10 seconds, then slowly relax
- Repeat 5-10 times, 3 sets/day

Leg Raises (Hip Flexor Strengthening)
- Lie flat on a firm, comfortable surface
- Straighten your knee on your operated side
- Tighten your thigh muscle and lift your heel 8”-10” above the bed
- Hold for 5-10 seconds, then slowly relax
- Repeat 5-10 times, 3 sets/day

Groin Stretches - Frog Position
- Lie on a firm, comfortable surface
- Bend your knees & slide your heels half way towards your buttocks
- Let your knees fall apart (like a frog)
- Relax & don’t hold your breath as you stretch
- Hold for 15-30 seconds, then slowly relax
- Repeat 5-10 times, 3 sets/day

Hip Abductor Strengthening - Standing
- Stand erect facing a counter top or other solid object
- Grasp the counter top firmly with both hands
- Shift most of your weight onto your non-operated leg as you lift your operated foot/leg out to the side
- Try to keep your body straight and don’t lean sideways
- Hold for 5-10 seconds, then slowly relax
- Repeat 5-10 times, 3 sets/day

Hip Abductor Strengthening - Side Lying
- Lie on your non-operated side with a pillow between your knees
- Keep your affected knee straight
- Lift your operated leg sideways towards the ceiling
- Hold for 5-10 seconds, then slowly relax
- Repeat 5-10 times, 3 sets/day

WALK, WALK, WALK!
- Use your cane until you have no further limp & feel steady on your feet
- Gradually increase the length of your walks each day as your strength allows
- Climb stairs normally as soon as you can comfortably manage them
ANTIBIOTIC PROTECTION FOR IMPLANTED JOINT PROSTHESES - J Hatch MD FRCSC

The American Academy of Orthopaedic Surgeons finds that there is very little scientific data to support the use of prophylaxis once 2 years have elapsed after joint replacement surgery unless specific risks of bacteria entering the patient’s bloodstream from the procedure (or patient) exist.

NB: ALL ANTIBIOTICS SHOULD BE TAKEN 1 HOUR BEFORE THE PROCEDURE

The following recommendations are extracted (in part) from the AAOS Online Service (http://www.aaos.org/wordhtml/papers/advistmt/denta.htm)

Routine Teeth cleaning, fillings-antibiotics required only if:
- significant bleeding expected
- within 2 years of joint replacement
  (this is controversial; most authors feel the risk is no higher than flossing your teeth!)
- immuno-compromised patients (e.g. Rheumatoid Arthritis & Diabetics)
Rx: Amoxicillin or Keflex: 2 grams by mouth one hour prior to the procedure
   If PCN Allergy: Clindamycin 600mg by mouth one hour prior to the procedure

Dental extractions, root canal
Rx: Same as above, but continue antibiotics if any evidence of dental infection

Urinary tract procedures (operative cystoscopy, gynecological surgery, transurethral resection of prostate (TURP), antibiotics required only if:
- within 2 years of joint replacement
- evidence of Urinary Tract Infection
- immuno-compromised patients
Rx: Cipro or Levaquin 500 mg by mouth one hour prior to procedure

Gastrointestinal tract procedures (colonoscopy, sigmoidoscopy, endoscopy with biopsy)
Endoscopy without biopsy, sigmoidoscopy, barium enema
Rx: Amoxicillin 2 grams by mouth or Flagyl 500mg by mouth, 1 hour prior to the procedure

Skin boils, infected lesions, ingrown toenails
Rx: Dicloxacillin, 500 mg, or KEFLEX, 500 mg by mouth every six hours, until lesion improved
   Consider Doxycycline or Septra DS if high risk of CA-MRSA

Breast biopsy, PAP smears:
Rx: Not needed

General Surgery
Rx: Antibiotics are procedure-specific. Tell your General Surgeon that you have a joint replacement

Cardiac Catheterization
Rx: Not usually needed but tell your cardiologist that you have a joint replacement