



▶ **Thursday, November 6, 2008**

---

Oxinium



Like most people, I had never heard of **Oxinium**. I vaguely remember the **Table of Elements** from high school chemistry. Near the middle of the chart is **Zirconium**, a chemical element with the symbol Zr and atomic number 40. Zirconium is a lustrous, gray-white metal that has no known biological role but due to significant advancements in technology, there is a new derivative material called Oxinium -- Oxidized Zirconium -- that is an extremely hard and highly scratch-resistant ceramic like material that has proven to be a superior metal for use in knee replacements. Not only can I spell oxinium now, I can walk on it -- literally.

Although the **knee joint** may look like a simple joint, it is actually the largest and one of the most complex. The knee can be thought of like the hinge on a door, except that the knee not only bends back and forth but also has a complex rotational component that occurs as we flex and extend the knee. The knee is formed by the junction of three bones: the **femur** (the thigh bone), the **tibia** (the shin bone), and the **patella** (the kneecap). These bones are connected to each other by strong **ligaments**. Because of the location of the knee and the way we use it -- or perhaps torture it -- the knee joint is also more likely to be injured than is any other joint in the body. For those who are fortunate enough to avoid a serious injury they instead will likely wear it out. The combination of wear and tear, high longevity, and a desire for extended quality of life, are resulting in rapid growth of orthopedic surgeries to **replace our knees**.

The procedure of knee joint replacement is called a **total knee arthroplasty** (TKA). This surgery involves replacing your knee joint with a manmade one. In total knee replacement, each **prosthesis** is

comprised of four parts. The **tibia** component has two elements and replaces the top of the shinbone (tibia). This prosthesis is made up of a metal tray attached directly to the bone and a plastic spacer that provides the load bearing surface. The **femoral** component then replaces the bottom of the thighbone (femur). The oxinium implant that rotates as we bend and flex our knee is said to be nearly 5,000 times more abrasion resistant than the cobalt chrome knees that had been used for many years. Projections are that the oxinium component will last 30-40 years. (Since I am 63, that should be enough!) The oxinium component on the end of the femur rests on a piece of plastic that replaces the worn **cartilage** -- in my case completely worn out -- that is made from **Ultra high molecular weight polyethylene (UHMWPE)**. This special polyethylene has the highest impact strength of any **thermoplastic** made. The polyethylene surface is inserted onto the tibia component so that the weight is transferred metal to plastic not metal to metal. During the operation any deformities are corrected -- I had my fair share of these -- and the ligaments are balanced so that the knee is stable and has a good range of movement. The articular surface of the patella is removed and replaced by a polyethylene button cemented to the posterior surface of the patella. The new kneecap then slides smoothly on the front of the knee joint.

More than a half-million knee implant operations are carried out each year around the world, mostly for patients who are over the age of 65. The new materials, such as oxinium, are now making it possible to replace knees in people in their forties, and we will soon see millions of knees replaced per year. A British company called **Smith & Nephew** claims to be the leader in manufacturing of the components and the tools to install them. They are projecting revenue of nearly \$4 billion for the year.

There are some pictures of what into my new joint in the **photogallery**. There is also a lot more to the story -- both leading up to the need for a knee replacement and the process of having it done and the rehabilitation. Stories to follow.

#### Related links

- **Other patrickWeb healthcare-related stories**

**Share This**

**Healthcare November 6, 2008 12:08 PM**

**October 28, 2008 | Home | November 10, 2008**



▶ **Wednesday, December 17, 2008**

---

### Oxinium Update



It seems like everyone knows someone who has had a **total knee replacement** or is considering one. There was a lot of feedback about the **Oxinium knee**, so I decided to share some more about my knee replacement experience. Tuesday marked eight weeks since the surgery and I feel very fortunate that progress has exceeded my expectations. At the final physical therapy visit I had hoped to achieve a **flexion** of 130 degrees. The therapist bent the knee while measuring with his **goniometer** and the result was 131 degrees -- the therapist was thrilled and so was I. A 120 degree flexion would be adequate for most activities but I was determined to get to 130, plus one for good measure.



My new knee has gone from a dream to reality. In a couple of weeks the real test will come -- getting through security at **Westchester Airport** on the way to Florida. No doubt that the pound or so of oxinium will set off all the bells and whistles. The "**knee card**" shows a very accurate picture of the **prosthesis** and on the back of the card are the details of who did the surgery, when, and where. I have a hunch the **TSA** staff will not be impressed.



Perhaps the **Fly Clear** card will help. It contains nothing about knees but it does have biometric fingerprint and iris image verification. Clear is also working with **General Electric** to offer shoe-scanning technology as soon as it is approved by the TSA, which will enable Clear members to

██████████ approved by the TSA, which will enable Clear members to leave their shoes on during security screening. Some people have security concerns about "smart" cards. By necessity we all travel with complete strangers. I don't feel a need to know about travelers life history but I think it is reasonable to know that each passenger is in fact who they say they are and that their travel history is not suspicious. Back to knees.

I feel extremely fortunate and happy that my knee replacement has gone so well and that the rehabilitation is ahead of schedule. Most knee replacements go well but it is possible to have an impact on *how* well. Following are the key factors from my layman point of view that I feel can make the difference.

- ✓ First and foremost is to make sure you really want to have your knee replaced, your surgeon agrees, and you are prepared to make it your top priority. Some say you should be in your seventies to have it done, but the advanced materials used today can last 30-40 years. I had two surgeries on my knee (1985 and 2001) and I waited too long. If you have daily pain and can't get the level of exercise you want, I say go for it.
- ✓ Clear the calendar. It really needs to be your top priority. If you are a type A and can't wait to get back to things you may end up taking shortcuts that end up preventing the fullest possible benefit to accrue. Your knee is **numero uno**. Medication and rehabilitation should take precedence and focus over everything.
- ✓ Find a surgeon that does nothing but joint replacements. There are many surgeons who have done replacements but I would say find one who does nothing but. High volumes leads to high quality outcomes. You can go to big cities and famous places but if you have a local surgeon who does just joint replacements and who is accessible you will feel better about the process. In the end, a part of the best result is having the best attitude going into it and feeling a relationship with the surgeon becomes a part of your attitude. I feel extremely fortunate to have had **Dr. Sanjay Gupta** perform my replacement.

- ✓ Learn everything you can about what is going to happen to you. Find out what company makes the prosthesis your surgeon will use and then visit their web site and read about what will go into your joint, how it works, what it is made of, and what procedure is used to install it. If you have the stomach, watch a video of a real operation at the **National Library of Medicine**. Maybe it doesn't really matter but I feel it is part of the attitude factor. The more you know the better you will feel.
- ✓ Prepare for it physically. Trim a few pounds, exercise as much as possible, cease any medications you don't really need, and get your mind around what will be happening. Envision the pain and process but also envision the "desired outcome". Another part of the attitude factor.
- ✓ If your insurance covers it, or maybe even if it doesn't, go to a rehabilitation center after you leave the hospital. There are mixed opinions on this. Some say going to another institution after the hospital increases your exposure and risk of infection. Some say there is nothing like home as the place to recover. I spent four nights in **Danbury Hospital** and then six nights at **Bethel Health Care Rehabilitation Center**. The center specializes in short-term "rehab". They have a continuous flow of patients. They have seen it all. Pain management is a vital part of recovery and they administer it and monitor it three shifts per day. Physical therapy is not an option -- you go to a therapist in the building twice per day, every day. It is painful but essential and the rehab center has it down to a science.
- ✓ Whether you are in rehab for a week or two (two weeks is probably average), pre-enroll with a **physical therapist** (PT) and start the day you leave the rehab center. Three times a week is best and keep it up for six weeks. Don't cut corners.
- ✓ Plan and commit to a home PT program. Ask the therapist for printouts of home exercises and do them faithfully. The investment you will have made in your knee -- in my case a lot more than my first house -- should be thought of as an investment (more accurately a joint investment with **Aetna Healthcare**). To get the most from your new knee it will need strong and flexible muscles surrounding it.

✓ Develop a balanced exercise program. For me, four **marathons**, many thousands of miles and dozens of **aces** were too much. No doubt that my knee needed replacement because I wore it out. More exercise is not necessarily better. Not enough is not good either. I often heard the advice to "listen to your body". I let my mind be in charge instead. Don't let it go to your head. Exercise, but think about your joints.

[Related links](#)

- **Oxinium knee - Part 1**

**ShareThis**

**Healthcare December 17, 2008 09:33 PM**

**December 13, 2008 | Home | December 28, 2008**



▶ **Wednesday, April 15, 2009**

---

### Promised Land



The weather for a hike in the **Delaware State Forest** near Promised Land, Pennsylvania was perfect -- not too hot and not too cold. **Promised Land State Park** is in the Pocono Plateau, 1,800 feet above sea level and is about 3,000 acres in size, surrounded by more than 12,000 acres of state forests. The forests are mostly beech, oak, maple and hemlock trees and include two lakes and several small streams. Our trail map was eight years old but thanks to the **Garmin Colorado 400t GPS** and well marked trails, my wife and I were able to have a successful hike of about five miles. We found **Promised Land Cache II** exactly as described at **geocaching.com**. A few pictures from the hike are **here**.

I am so thankful to have the new **oxinium knee** and that it allows for hiking after less than six months. Last summer it was hobbling around and a half-mile hike resulted in a lot of pain. It seems like everyone knows someone who has had a total knee replacement or is considering one. Much praise and credit is due to **Dr. Sanjay Gupta** and the teams at **Danbury Hospital** and **Bethel Health Care Rehabilitation Center** but I also believe the preparation and approach to rehabilitation make a huge difference as well. The factors that made the biggest difference for me are **here**.

### **ShareThis**

**Geocaching** , **Healthcare** , **Hiking April 15, 2009 07:39 PM**

**March 29, 2009** | **Home** | **April 19, 2009**