The Current State of Joint Replacement

Left to right: Robert Murphy, MD, Adrian Graff-Radford, MD, and Raj Sinha, MD, PhD

Joint replacement can relieve pain and enable individuals to live fuller, more active lives. Great advances have been made in joint replacements since the first hip replacement was performed in the United States in 1969. Improvements have been made in the endurance and compatibility of materials used and the surgical techniques to install artificial joints.

Eisenhower Medical Center, recently named a 100 Top Hospital®, performs more than 800 knee and hip replacements annually, and is ranked number five in the state of California for the total number of knee and hip replacements performed.

As Eisenhower Medical Center prepares to launch the new Eisenhower Joint Replacement Center in October 2005, Healthy Living magazine recently assembled three nationally-recognized orthopedic surgeons to discuss the current state of joint replacement surgery: its benefits, challenges and technological advances, as well as what the future holds for this important lifeenhancing treatment.The panel included Robert Murphy, MD, Raj Sinha, MD, PhD, and Adrian Graff-Radford, MD, who served as moderator. These orthopedic surgeons are instrumental in the development of the new Eisenhower Joint Replacement Center.

Dr. Murphy: There are about 600,000 total joints done annually in the United States, and that number is projected to double over the next 10 years. The volume that we are currently doing is over 800 joints per year, and we expect that our volume will also double over the next 10 years.

Dr. Sinha: We want to be prepared for this increase, and so the natural progression is the development of an Eisenhower Joint Replacement Center (please see Eisenhower Joint Replacement Center, page 30). Over the last several months now, we've been reorganizing our processes, making them more efficient, streamlining and standardizing protocols. Ultimately,we want to develop a center that has a very predictable, enjoyable experience for the patient. We're moving forward, and looking toward an October launch.

Dr. Graff-Radford: We've created a program which goes from "A to Z," a set of protocols that will ultimately benefit the patient because of the standardization of efficiencies.The net outcome is that the patient wins every time. And obviously, it is great for the hospital because it results in a much more efficient utilization of both the facility and the staff.

Dr. Sinha: We are also anticipating what's happening with future growth. For example, this summer we really haven't seen a decline in surgical volume that had been seen in previous years. The desert has become a year-round community and not just a winter resort community.

Dr. Murphy: The joint replacement center also will serve as a pilot or model program for how physicians and hospitals are going to relate to each other in the future to maximize efficiency and cost of care.

According to Johnson & Johnson research, for each person in the community who needs a hip or knee replacement and sees a doctor, there is another person in that same community who also needs a joint replacement and does not seek medical care. This is because they are not properly informed – they simply don't know what's available, or they don't have accurate information about their condition.

Dr. Graff-Radford: One of the most important things in hip and knee replacement longevity is wear of the implants. There have been significant improvements in technology relating to wear. If you diminish wear, you diminish the failure of the joint replacement. There have been recent and ongoing changes, for example, in the surfaces and materials that are being used.

Dr. Sinha: Yes, there are basically three distinct "couples" – the materials that rub up against other materials in the artificial joint. The traditional one is an alloy called cobalt-chrome-molybdenum, which is a type of metal against plastic. In recent years, the plastic has improved to a point that it shows extremely low wear.

Dr. Graff-Radford: This plastic is called highly cross-linked polyethylene, which has been around for about seven years now.

Dr. Sinha:The second major couple is metal on metal, which is cobalt-chrome alloy against cobalt-chrome alloy. One of the advantages of metal on metal is that the wear is extremely low. The body responds to particles generated by wear, by trying to reject them. Although it can't reject the particles, it secretes enzymes which result in some bone destruction. Metal on metal is a popular couple, and is being used more often with younger, more active patients because the wear is much lower than metal on plastic implants.

The third major couple is ceramic on ceramic, which, although it has been around since the late 60s, has gone through many iterations. Similar to metal on metal, there is a very low wear of ceramic. In addition, the number of particles released may be even lower than metal on metal. However, ceramics are very brittle and have been subject to fracturing in the past. The newest ceramics may be solving this problem.

Dr. Murphy: The gold standard has been the cross-link polyethylene on metal. For the average patient in their 70s, this coupling is probably going to last a lifetime and give them good service.

However, younger patients have a higher demand for activity. The new metal on metal joints can take a tremendous amount of load, and allow for a much higher level of activity. Ceramic implants have, in the past, tended to be somewhat brittle, although with the new ceramics that is a problem that might be resolved. I tend to favor metal on metal implants.

Dr. Graff-Radford: At one time, the ceramic was smoother than anything we could find.With modern technology, however, the cobalt-chrome or the metal heads that we now use in hip replacement, or the metal surfaces we use in a knee replacement, are much smoother. However, if you have a 90-year-old patient, you can probably use anything and it's going to last the rest of their life. But we're all starting to see younger patients in our practices.This is not, if you will, an old person's disease anymore.

Dr. Murphy: A recent article noted that 30 percent of the United States population that currently would benefit from total hip and knee replacement is under the age of 62, which is interesting, in view of the fact that most of the follow-up studies on joint replacement show that the average age of patients actually having the procedure is 70 to 71. So, obviously people could benefit from this surgery at an earlier age.

With the new bearing surfaces that are available and new technologies, such as the minimally-invasive approaches, people will be having this operation done at an earlier age. Clinical results also indicate that the patients who have the procedure done before they develop significant deformity or lifestyle compromises, actually have a better outcome.

Dr. Sinha: Another offshoot of the new materials is that we've been able to put in larger balls [in hips] because the materials are so much more durable, thus allowing patients to have much greater range of motion and less risk of dislocation.

Dr. Murphy: Younger patients are not interested in cutting back or limiting their lifestyle after having hip or knee replacement surgery. Quality of life, and not just quantity of life, is very important to them. As a result, there is an increasing demand for these newer alternative surface implants, as well as minimally-invasive surgical techniques that reduce the time of post-operative rehabilitation.

Dr. Graff-Radford: There's also a demand for longevity. The life expectancy of a man or a woman is much different today than it was 10, 15 or 20 years ago.There are people here in the desert that are very active in their 70s, 80s and even 90s.

Some of the other big surgical advances are minimally-invasive surgeries and new computer technologies (please see Innovative Orthopedics,) This is the way the industry is going….

Dr. Sinha: The younger patients are looking for less recovery time, they need to get back to work, provide for their families…and that's the impetus for surgeons to develop more minimallyinvasive surgeries. The concept centers around less tissue damage – tissue sparing, muscle sparing – those are the synonyms being used.

The idea is to do the operation equally well by not cutting as much muscle, tendon, bone, and ligament.The shortterm results suggest that the patients recover faster. However, by three and six months after surgery, there is no difference between patients who had a traditional larger surgical incision and those who had a minimally-invasive approach.

There is a term in medicine called "Quality-Adjusted Life Year," which tells us how much of an impact a medical intervention had on patients' quality of life. Hip replacement is #1 in the history of medicine on improving the quality of human life. So, we know this is a good operation. The new Eisenhower Joint Replacement Center will provide seamless care for joint replacement patients and their families, from consultation to surgery, with integrated post-operative care, rehabilitation and therapy. Patients will receive premium care, from some of the most skilled surgeons, using the most advanced technologies, and are supported throughout the process by highly trained Orthopedic Specialty Nurse Coordinators.

Step-By-Step Process Patient consultation with doctor to discuss options and care. Initial basic education about alternatives and the process of joint replacement. Patient makes a decision. "Yes, my lifestyle is limited, and I don't want to be in pain anymore. I want to get my hip (or knee) fixed." Consultation with Orthopedic Specialty Nurse Coordinator to review each step of the procedure of joint replacement. This consultation includes orientation and education classes, and comprehensive notebooks containing detailed information on the procedure and recovery. Physician's office pre-operative testing, and required additional physician consultations, dependent on patient condition. Orthopedic Specialty Nurse Coordinators work with the patient to schedule preoperative appointments, physician visits, tests and anesthesiology consultation. Meet with anesthesiologist for one-on-one consultation. Patient receives joint replacement surgery with dedicated operating team specialized in orthopedic surgery. Specialized post-operative recovery coordinated by a highly trained team of specialists. Orthopedic Specialty Nurse Coordinators work with patient and family to plan for discharge, which includes post-operative appointments, home care, physical therapy and any further tests required.

Healthy Living is a publication of Eisenhower Medical Center · © Copyright 2014 All Rights Reserved · www.emc.org