

Advances in Joint Replacement



Robert Murphy, MD

Eisenhower Medical Center is rated by HealthGrades as the Best (#1) in California for Joint Replacements and Top 5% in the Nation for Joint Replacements. The Center's team approach includes experienced surgeons, a dedicated nursing staff, state-of-the-art technology, comprehensive care and rehabilitation therapy, and a sophisticated education program for patients.

Healthy Living magazine recently assembled three Eisenhower Medical Center experts to discuss the latest developments in joint replacements and what the future holds for this expanding field of medicine. The participants were Board Certified Orthopedic Surgeons Robert Murphy, MD, Adrian Graff-Radford, MD, and John Velyvis, MD. Dr. Murphy moderated the discussion.

DR. MURPHY: Medicare expects the number of patients having hip and knee replacement surgery to double over the next 10 years. Why the dramatic increase, John?

DR. VELYVIS: Currently in the United States, surgeons are performing more than one million hip and knee replacements per year, and that number is expected to double by 2018. Baby Boomers are getting older, so more and more people will be over the age of 65. Thanks to dramatic advances in health care — particularly in cardiology and elder care — people are living longer. One of the consequences of living longer is that we see more and more cases of arthritis. The longer you walk on your joints, the more likely you are to develop arthritis. More joint replacements are done in elderly women, because they currently live much longer than men.

DR. MURPHY: We are also seeing joint replacements being done on younger and younger patients. Why is that?

[PHOTO dir="assets/news/johnvelyvismd.jpg" align="right" caption="John Velyvis, MD" width="250"]

DR. VELYVIS: As we get more comfortable with improved surgical techniques, and our materials get better, we're confident that we can help people at earlier ages. When joint replacement was first introduced, doctors were very selective in determining who qualified for the procedure. We were worried about how long the replacements would last.

Now, we're seeing after 30 years of use that the results are quite dramatic — the patients are doing well, and the joint replacements are lasting longer than expected. We believe the new replacements we're using now will last even longer. So we are confident we can help people with arthritic joints at a younger age, and trust that their joint replacements will last and work well for them.

DR. GRAFF-RADFORD: Confidence in the technology has improved substantially. Most implants today are going to last 20 to 25 years or longer, assuming ideal conditions for placement and healing. Younger patients might have to have an additional replacement later in life, but patients in their mid-50s and older are probably not going to need a second replacement.

DR. MURPHY: Today there are several different types of materials used for replacement joints. What are the differences between ceramic implants versus metal or plastic?

[PHOTO dir="assets/news/adriangraff-radfordmd.jpg" align="left" caption="Adrian Graff-radford, MD" width="250"]

DR. VELYVIS: Each of the surfaces currently used in joint replacement surgery has its own advantages and disadvantages. Certain patients have specific requirements for things that they want to do based on age and their activities, and we can adjust our materials to each patient on a case-by-case basis. It's based on the individual, and an experienced surgeon can make a recommendation on what would be best for each patient.

DR. GRAFF-RADFORD: When it comes to having a replacement redone, as younger patients may require later in life, we have a concept now called "modularity." The bearing surfaces can be removed, rather than removing the entire component.

DR. MURPHY: We read about advances in computer-assisted surgery and robotics, I believe that their future role in surgery is extremely exciting. What are your thoughts on the use of computers and robots in joint replacement surgery, and where do you see this technology going in the future?

DR. GRAFF-RADFORD: I think we're very early on in the evolution of computers and robotic surgery. Computer-assisted surgery helps the surgeon visualize exactly what he's about to do, and can certainly help the surgeon align the prosthesis better to a patient's specific anatomy. It's still very early in the field of robotic implantation.

DR. VELYVIS: Computers can also help us check exactly what we've done during surgery, which allows us to be more accurate every time. They give us a lot more information, beyond just what we can see. Currently, robotic technology can assist the surgeon with precision, but we are a long way from robotics being widely utilized. I am currently performing both computer and robotic assisted joint replacements.

DR. MURPHY: I believe the greatest advancements in joint replacement surgery over the past five years have not been in technology, but in the management of the patient's post-operative pain. These advances have dramatically reduced the fear of surgery and the stress on the patient's body. What are some of the pain management techniques that we're using at Eisenhower?

DR. VELYVIS: There is no question that many patients are still fearful of having surgery. One of the advances is the use of spinal anesthesia instead of a general anesthesia, whereby the patient breathes on his own throughout surgery, rather than by a breathing machine, which reduces throat soreness for the patient. The benefit of this is that the pain relief lasts for 24 to 36 hours after the surgery, so the patient wakes up feeling comfortable.

Another important advance is "preemptive analgesia." We try to block the pain receptors in the peripheral nerves and brain before we even make an incision, preventing the brain from receiving stimuli that will cause discomfort, helping decrease post-operative pain, and even reduce the pain medications the patients will need while they're in the hospital recovering from surgery.

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DR. MURPHY: We can manage most of our patients' post-operative pain with oral medications, which allows them to get up and move quickly. We usually get patients up the same day as their surgery, and we can do that because of the pain management advances we're talking about. How long is the typical hospital stay for joint replacement surgery?

DR. GRAFF-RADFORD: In the Eisenhower Joint Replacement Center, the patients stay usually two nights and are discharged on the third day. But, it's dependent on the patient's overall medical condition and other problems that they may have. For example, if someone has pulmonary disease or heart disease they may need to stay in the hospital longer. On the other hand, you may have someone who is otherwise healthy and 50 years old who can go home the next day.

DR. MURPHY: Thanks to all the medical advances we are seeing in this field, more and more patients — both older and younger — are having hip and knee replacement surgery. If age is no longer the principle criterion for surgery, when should a patient consider joint replacement surgery?

DR. GRAFF-RADFORD: I tell most patients there are really only two reasons to do a hip or knee replacement. Reason one is pain. Reason two has to do with their lifestyle — has their condition made it impossible for them to do the things they want to do? I may try to postpone surgery with my younger patients and will use non-surgical means to extend their care, such as anti-inflammatories, weight loss, rehabilitation, exercise, steroid shots. There is also a procedure that we call viscous supplementation, which is a fluid that we inject into the joint that acts like oil in an engine, if you will. But if all these things fail, then we move to joint replacement surgery. By replacing the hips and knees they can go back to most activities. I allow them to play tennis and to ski; I allow them to do most things. I don't let them jog, but hiking, biking, and dancing, or whatever else they wish to do, they can.

DR. MURPHY: So it's not an issue of age. It's an issue of pain and quality of life. Is that what you discuss with your patients?

DR. GRAFF-RADFORD: The decision on when to have surgery is a critical one, and should come only after a detailed discussion between the patient and the surgeon. Our patients are very sophisticated. By the time they come to see us, they have already done a good deal of research on their options. If I have a 30- or 35-year-old patient, obviously I am going to try to delay joint replacement surgery for as long as I can. But if they are at a point where they cannot function — for example, people with rheumatoid arthritis who have destroyed joints, then they will benefit from having their joints replaced no matter how old they are. With today's technology, we feel comfortable offering joint replacements to older and older patients, as well as younger and younger ones.

DR. MURPHY: We've talked about advances in surgery and implant technology. Are there any non-surgical advances that can help people be more active?

DR. VELYVIS: Adrian mentioned viscous supplementation. There are some other exciting advances that may benefit patients. Many people are taking glucosamine and chondroitin sulfate to preserve their joints. There is no specific study that says it's going to restore a joint, but if patients take it early enough, it could help to preserve a joint.

We are seeing better pain medications that target the appropriate receptors, reducing side effects. Advances in physical therapy mean we're getting better at helping people restore their joints and stay mobile. The BioniCare® knee brace, for example, helps the patient's muscles using pulses of electrical stimulation and keeps the joint aligned properly, which may delay the requirement for surgery because the patient's pain is minimized.

DR. MURPHY: I am often asked about the possibility of cartilage injections. Is there any research that indicates someday that will be possible?

DR. VELYVIS: Absolutely. With arthritis, we are dealing with the loss of cartilage. Major laboratories and universities are working on cartilage restoration. No one has been able to reproduce or grow new cartilage on the end of a bone yet, but you can imagine that sometime in the next 25 to 50 years that will happen, and joint replacements will become obsolete. Cartilage restoration for small defects is available to us today, and as technology improves, we will be able to restore cartilage on bigger and bigger lesions. It's a very exciting time. Joint replacement may change dramatically in the future because of these advances.

We are also starting to see great success with partial knee replacements. I think in the next five to ten years, we'll have smaller metal caps that we can place on cartilage lesions. We're probably going to see a bi-compartmental knee replacement as an alternative to a total knee replacement, which helps give the patient a more normal feeling knee, a smaller surgery, a quicker recovery and fewer restrictions on physical activity.

DR. MURPHY: All of these advances are very exciting, and patients have more options than ever before. One of the most important things we can do is help educate patients about their options and ensure they are well informed about every aspect of joint replacement surgery. At Eisenhower we walk them through every step of the procedure, including a class prior to joint replacement surgery. We make sure they understand the operation itself as well as their recovery, what they will experience from day one through all their exercises, rehabilitation, pain management, and life after surgery. And when they leave we give them materials that address virtually any question they might have. The combination of technology, top-notch health care professionals and a well-informed patient is what we strive to achieve here, and is what leads to the successful outcomes we have been seeing in joint replacement surgery at Eisenhower.