

STATE-OF-THE-ART KNEE REPLACEMENT SURGERY
ST. MARY'S HOSPITAL
MADISON, WI
January 22, 2008

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ANNOUNCER: Welcome to St. Mary's Hospital in Madison, Wisconsin. Over the next hour, surgeons will perform a total knee replacement surgery live from one of St. Mary's 18 new high-tech operating rooms. With the help of sophisticated guide instruments, orthopedic surgeons will remove a portion of a worn or diseased knee and replace it with metal and plastic implants. When knee pain fails to respond to other treatments, total knee replacement surgery offers many patients the best chance to regain their mobility and return to an active, pain-free lifestyle. Dean and St. Mary's surgeon Dr. David Wolff will perform the procedure while Dr. Richard Glad, chairman of the Dean Department of Orthopedics, will provide expert commentary. OR-Live makes it easy for you to learn more. Just click on the "Request Information" button on your webcast screen and open the door to informed medical care. Now let's go to the operating room where the surgery is already in progress.

00:01:14

STEVE VAN DINTER: Good afternoon and welcome to today's webcast. We are coming to you live from St. Mary's Hospital in Madison, Wisconsin. Over the next hour, you're going to have the unique opportunity to see Dean and St. Mary's orthopedic surgeons perform a live total knee replacement from some of the new state-of-the-art operating suites right here in St. Mary's Hospital. I'm Steve Van Dinter, I'll be your host for today's program. And joining me right here live in the studio is Dr. Richard Glad, who is an orthopedic surgeon with Dean and St. Mary's Hospital. Also, performing today's surgery will be Dr. David Wolff, who is also a surgeon with Dean and St. Mary's Hospital. But before we go live to Dr. Wolff, I'd like to remind you, the audience, of a few things. First, we do welcome any and all of your questions, so please be sure to send them in. You can do so by clicking on the MDirectAccess button, which is located right on your screen above. So go ahead and send those in. We're going to try and promise that we will do our best to get all of them before the end of the program. Also an archive of today's program will be available on the same web site that you're visiting right now, so go ahead and save that link and send it out to family and friends later. And that again will be up shortly after today's broadcast. So without further ado, let's go live now to the St. Mary's operating suite, where Dr. David Wolff is standing by. Dr. Wolff?

00:02:27

DAVID A. WOLFF, MD: Thanks, Steve. Welcome, everybody, to St. Mary's operating room number three. I guess I should introduce our staff. Dr. Reichersdorfer is the anesthesiologist this afternoon. Jen Schultz, a nurse anesthetist working with us. Larissa Decker is our circulating nurse. Jimmy Kim is our surgical technician. Dave Wilson's a physician assistant here, and our gentleman here is a 61-year-old man, he's got advance rheumatoid arthritis of his knee, and his pain and his function have gotten bad enough that he wants to have his knee replaced, and we're going to do that for him this afternoon. We're ready to go. Knife, please, Jimmy.

00:03:01

STEVE VAN DINTER: Sounds good. And, Dr. Wolff, we are actually going to look at here live on the screen an x-ray of this person in just a moment here, but it looks like he's making that first incision, Dr. Glad.

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RICHARD W. GLAD, MD: Yeah, and he's using a standard midline approach, so he's making his incision right down the front of the knee, but if you look at the x-rays quickly, these really show a marked contrast between the two knees. On his right knee, you can see that there still is a significant gap here between the bones, between the femur above and the tibia below, nice symmetric joint spaces in contrast to the left knee that really is dramatically worn. You can see that there is no gaps between the bones any longer. In fact, the femur is start to erode or scallop into the tibial surface.

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STEVE VAN DINTER: So what are we seeing right here? So he's made that first incision at this point.

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RICHARD W. GLAD, MD: Right now he's in the process of developing the skin flap, so opening the skin, exposing what's called the capsule of the joint. He's down to just the area that's just above the patella here, and he's making what's called the arthrotomy, or the opening to the joint right along the border of the kneecap, which is what he has his index -- his left index finger under right now. So now he's exposing the joint underneath the kneecap.

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STEVE VAN DINTER: Now that -- that flap that he just lifted up there, that is the kneecap itself, then?

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RICHARD W. GLAD, MD: The kneecap is directly underneath that.

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STEVE VAN DINTER: Okay. And that tissue, is that some sort of connective tissue there, or is that a fatty substance?

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RICHARD W. GLAD, MD: Right now, it's -- right now what he has, he has a cautery unit that he's cauterizing bleeders to block bleeding into the joint. That tissue is fatty, but if you look at the surrounding tissue, the whiter tissue in that view is actually the joint capsule, which is a very dense, fibrous material. It's -- gives you a nice -- holds a stitch nicely so that when you close the joint, it creates a nice occlusive seal.

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STEVE VAN DINTER: Now, I'm just amazed. We're just a few moments into this, one to two minutes in already, and we're already -- got the kneecap pulled back and ready to go. This really seems like the doctors know exactly what they need to do and they get in and do it.

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RICHARD W. GLAD, MD: Well, it's -- it's a procedure that's done frequently, and just by repetition, it ends up becoming quicker and quicker. And it ends up being done in a very step-wise manner. And every physician has his own routine for doing things, and as a consequence, it makes it a very smooth approach.

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STEVE VAN DINTER: Sure. Now, when we looked at that x-ray before, we saw those rough, jagged edges. Is that what's causing some of that pain? I'm sure this person was in some pain. It looked like arthritis or something like that?

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RICHARD W. GLAD, MD: Pain is the primary reason for having a joint replacement done. These people are really miserable, and activities are markedly limited. And so any kind of procedure for pain relief can -- it's -- they're extraordinarily grateful for it.

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STEVE VAN DINTER: So now we're -- let's see, he's lifting back that flap there.

What's he doing now?

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RICHARD W. GLAD, MD: He's extending the incision up above the knee so that ultimately he'll be able to flip the kneecap out to the side so that he'll have a better visibility while he's doing the joint replacement itself. He's doing this first part with the knee extended, but ultimately he'll start working with it flexed. It'll give us a much better picture of the inside of the joint.

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STEVE VAN DINTER: Now, I'm pretty surprised. We made some pretty serious incisions here and we're not seeing a lot of blood. Is that typical?

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RICHARD W. GLAD, MD: Well, he has a tourniquet up, so the tourniquet goes up around the upper part of the thigh, so there's really very little bleeding that occurs during a knee replacement operation.

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STEVE VAN DINTER: Sure. Now, I just saw him pound something into -- looked like that lower bone there. What was going on?

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RICHARD W. GLAD, MD: He's -- one of the things that occurs as you flex the knee up to this point and push the kneecap off to the side is that it puts significant stress on the attachment of the patellar tendon, or the kneecap tendon, as it attaches to the bone. And so he put -- he just put that pin in there to hold it, to keep it from tearing off. But if you look at this last view here, you can see how really degenerative this knee is. That bone, the end of the femur there, which is the bone that's exposed above, should have a very smooth -- a normal joint will have a very smooth what's called articular surface, which is joint surface cartilage, and you can see in this knee, and typical of a rheumatoid knee, it's completely eroded down. That's all bare bone, it's just like ivory. And that has such a high-friction surface that it becomes -- that when you walk on it and you put weight on it, it becomes very painful for any kind of walking or weight bearing.

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STEVE VAN DINTER: Just amazing what science and doctors are able to do at this time, to open this up. Because we're going to actually end up shaving off some of this bone right here, correct?

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RICHARD W. GLAD, MD: Yeah, the whole end of this femur -- right now they're taking the bone spurs off. The end of this bone is going to be really re-contoured to very precise cuts using a guide system that's available that's going to re-contour the end of that into really a five-sided structure -- five different angles of cuts off the end of the bone that will accommodate this metal implant that's ultimately going to be placed on there.

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STEVE VAN DINTER: And while we're looking at this video, we are getting some e-mails in already, so if people do want to continue to do that, please click on that MDirectAccess button right on your webcast screen. But I'm going to just ask a few questions as we're looking here as this goes on, but we've got a gentleman named Don DeSpane who's actually sent us in a question saying he's 73 years old, weighs

325 pounds, and wants to know if a knee replacement can be done, considering his weight.

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RICHARD W. GLAD, MD: Well, obviously, weight is always an issue, and people that are very obese, it makes the surgery considerably more difficult. It's difficult to get an exposure as nice as this in a really big leg, but I will tell you that we operate on people even larger than 325 pounds on a regular basis. One always does have the concern that that's going to receive a tremendous load and the longevity of an implant may be impaired as a result of doing a joint replacement on somebody that size, but you know, anything that one can do to control their weight is fine, but the problem is that people are having so much pain with wear of the knee, then it's difficult to pursue any kind of weight management programs, and so it's not an absolute contraindication to doing the surgery. It is one of those things that does create an added risk factor for long-term expectations for a joint.

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STEVE VAN DINTER: Sure. And as we look at this particular screen that we're looking at right now, Dean Smith asks: are the ACL and PCL preserved in this procedure?

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RICHARD W. GLAD, MD: Depends on the implant. The operation that's being performed today, both the ACL and the PCL are going to be removed. And it's my understanding that Dr. Wolff is going to put in a type of implant called a posterior stabilized implant, which really is designed to replace both those ligaments. There are other types of implants called cruciate-retaining implants, in which case the ACL is usually sacrificed but the posterior cruciate ligament is preserved. But this shows you -- what he's doing right now shows you one of the new designs in the instrumentation, which has really improved dramatically. You can see that he actually has a guide that has a slot in it. That's called a captured cut. That allows you to use -- place your saw blade in through that guide, so it improves the precision of the cut. And he's just making a decision here at this point as far as how far down in the bone to make the cut and really what the correct angle of that cut is so that we end up with a joint that's perfectly aligned.

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STEVE VAN DINTER: And this cut is so important, right, for the rest of the procedure?

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RICHARD W. GLAD, MD: Really, all the cuts are important. They can always be revised if you're unhappy with them, but you want to -- ideally, you'd like to get them where you like them the first time. It's always a little bit difficult to revise them. So there clearly is some flexibility, but you can see, he's repeatedly placing that guide on there just to ensure the certainty that this cut which he's about to make right now is going to really be in an accurate position and really allow for correct alignment of the leg afterwards. That's one of the things that you're trying to achieve.

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STEVE VAN DINTER: We talked about this beforehand, but about how much of the bone is actually shaved off during this process?

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RICHARD W. GLAD, MD: It depends to a certain degree on which cut you're talking about. Right now, he's taking off -- you can see, if you go back and look at his original x-rays, you can see that there's more bone loss on one side of the knee than the other, so he's going to be taking off more bone off one side than the other. But usually you try to take off the least amount of bone possible that's going to accommodate the implant. You always want to preserve as much bone -- any time

you do an operation, you're always thinking, "What can I do now that if I ever have to come back is going to make this the easiest situation to come back to?" And so you want to preserve as much bone as you possibly can in case you ever get to the point where you need to consider a revision.

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STEVE VAN DINTER: Sure. And e-mails continue to keep coming in, so we thank the viewers today, and please do continue to click on that MD access button and send us in your questions. Russell Ramirez had one. He's a 42-year-old male, he's got arthritis in his left knee. He was told that a knee replacement -- that he didn't need one -- actually that he does need one, sorry, but he doesn't really want one at this time, is wondering if there's any alternatives to knee replacement surgery.

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RICHARD W. GLAD, MD: Well, there's always some alternatives. I mean, there are -- and it depends on the extent of where. If you look at someone's radiographs, x-rays, you can really get an idea as to -- typically get an idea as to whether or not there are other alternatives. Certainly anti-inflammatory medications can be helpful. Physical therapy for muscle strengthening. You have to keep in mind here that the muscles, I really consider them the shock absorbers to the joint, so the better conditioning of the muscle, the better shock absorption there is to the joint. Medications like glucosamine can be effective. Cortisone injections are always an option, although they're typically a temporizing measure. And then there are other lubricating materials that have had some variable benefit that one does repeated injections into the joint. And then if there's not too much wear, you can consider a knee arthroscopy to clean out the joint. But once people get enough wear that's like this, where it's down to bone-on-bone, then really the only option ends up being a joint replacement.

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STEVE VAN DINTER: Now, I just saw them take out a piece of bone right there. Was that the piece that he had shaved off?

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RICHARD W. GLAD, MD: That's -- that flat surface is the piece that he took off the top of the tibia. So he created a nice, flat, smooth surface to accommodate the tibial implant, and then he put a drill down the center of the canal of the femur, and he's placing an alignment jig onto the end of the femur that's going to help him position cutting guides to create the proper cut. And it's not only going to create the proper cut, but it's also going to place it in the proper rotation. Rotation in alignment is critically important to the good function of the knee, and it's probably -- getting that alignment corrected is one of the things that the more experience you have with it, I really think that the easier that becomes.

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STEVE VAN DINTER: So he is shifting that leg around right now to figure out what the proper alignment is.

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RICHARD W. GLAD, MD: Yeah, he's just -- he's just getting a feel for the balance of the soft tissues.

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STEVE VAN DINTER: That's amazing. Very amazing. Another question that came in here, as we've seen in some of these wider shots, that folks are asking the head cover like the one the doctor is using, could you explain why it's necessary for procedures like this, open orthopedic one, but not for things like abdominal procedures?

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RICHARD W. GLAD, MD: Well, you can watch right now as he's using the saw here, there's a lot of material that's actually vaporized from that saw, and by the end of the procedure, if you were to look at his mask, it's really going to be covered with, you know, fluids and debris and material, and so it is protective to the surgeon because, you know, there are always potential eye splatter and places the surgeon and the staff at risk from things like that. But then also, it works in both directions here, too. It prevents materials that are on the surgeon to get into the wound and contaminate. And one of the biggest worries about any kind of joint replacement is the potential for infection. And that's the one thing that really can have disastrous consequences. And so we do everything that we can to minimize the risk of infection. And the hoods, we don't have a tremendous amount of data that they actually reduce infection, but just from a logic standpoint, I think it's clear that they have a protective benefit.

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STEVE VAN DINTER: Now, why are joints like this surgery so crucial in terms of keeping out external things, like you're talking about, bacteria and other things? What makes this procedure so different in terms of infection?

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RICHARD W. GLAD, MD: Well, any time you place foreign material like the metal of a knee replacement into a joint, that creates a foreign body, and it's a surface that bacteria can get onto. And once they do get onto it, it can be very difficult to eradicate them. I mean, you can -- they -- a lot of bacteria will form a protective covering that antibiotics cannot penetrate, and yet they can stay on the implant. And so once a joint gets infected, it can be very difficult to eradicate.

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STEVE VAN DINTER: So that's why it's crucial to make sure that you look at the hospital and look at the doctors that are doing this surgery, make sure they've done a lot of them, I'm assuming?

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RICHARD W. GLAD, MD: Yeah, I think -- you know, you look -- look at all the data and it is clear that experience makes a big difference as far as outcomes.

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STEVE VAN DINTER: So right there, it looks like he's shaven off part of that --

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RICHARD W. GLAD, MD: So he's cutting off the end of the femur here, and he took off just one of what's called one of the condyles. He's now taking off the other one. So this is going to be the flat, distal, or end, surface of the bone.

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STEVE VAN DINTER: And they're going to attach that joint, the artificial joint, right onto that.

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RICHARD W. GLAD, MD: Correct. It's ultimately going to be glued on with what people call bone cement.

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STEVE VAN DINTER: So that hole that he drew up the femur there, is that how it's going to attach and stay firmly attached?

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RICHARD W. GLAD, MD: No, actually that -- that hole up the end of the bone there is really an alignment guide. So all these -- the inner part -- the central part of the bone is basically hollow. It's where the marrow is, and it allows -- that long guide that went up that bone was really an alignment guide. So here he's just selecting the size of the implant that he's going to use.

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STEVE VAN DINTER: And there are different sizes that do get attached?

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RICHARD W. GLAD, MD: Yeah, that's -- that's one of the big advances, really, that's occurred in joint replacements. We used to have a very limited number of sizes. I mean, at one point, just small, medium, large. Now we have just multiple sizes. And you can mix and match the femur size with a different tibia size, with a different kneecap size. And so these are very modular and allows a lot of flexibility in selecting an implant that really perfectly matches a person's anatomy.

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STEVE VAN DINTER: Another one of our viewers has a great question: what's the average length of stay for a patient who has one of these procedures done?

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RICHARD W. GLAD, MD: Well, it's getting shorter and shorter. I tell people now that our average length of stay ends up being the day of surgery plus three days. So typically if somebody comes in on a Monday, they leave on a Thursday. There certainly are times where people are young and healthy and mobile and in good condition where if they can clear from therapy, it's certainly an option to get them out of the hospital a lot sooner.

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STEVE VAN DINTER: How long is it until people typically do normal things. Someone asked: what about driving? How long till they can drive again?

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RICHARD W. GLAD, MD: Well, it varies. It certainly varies. I mean, obviously, doing a right leg relative to driving has a lot more impact than doing a left. And I usually tell people that I really don't worry about them injuring the knee from driving. I do worry about the liability issue of somebody driving and not having good leg control. I tell people when they have good leg control and they can be certain that they can slam on the brakes if somebody runs in front of their car, then I think that's a point. I don't normally set a specific time in days. I've heard some people have suggested six weeks, but I really think that a lot of people now with the newer implants are actually pretty mobile far sooner than that and are able to do activities such as driving a lot earlier.

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STEVE VAN DINTER: So recovery time really varies on a person by person?

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RICHARD W. GLAD, MD: It does. It kind of depends on really what the starting point and the condition of the person was before the knee replacement. There are many times people come in, they have extraordinarily limited range of motion, and so rehab in the knee afterwards ends up taking a lot longer. In contrast to this person, who actually had quite good motion and much better motion than you would expect based on his x-rays. His x-rays look awful. And one would certainly have expected with that much rheumatoid disease that his range of motion would be far more limited than what it is. So he's fortunate. And in all likelihood will be able to rehab the knee quicker than somebody who otherwise had poor motion.

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STEVE VAN DINTER: Now, do you put restrictions on your patients on what they can do or can't do until they're fully healed?

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RICHARD W. GLAD, MD: Again, that varies. And I think that there are individual preferences and obviously logic comes into this. I really would argue that people avoid things like impact loading, so running and jumping, heavy carrying at a walking pace -- everything that you pick up and carry, you have to multiply that weight times four, because that's the weight that the joint sees. And so -- and that

influences weight reduction, too, just from a dieting standpoint. So people that can lose weight, it certainly is helpful. But I -- you know, people that are out that they play golf, they walk, I encourage biking, I think elliptical trainers are good exercises. And you know, so the whole goal of doing this operation is to give people an active lifestyle and allow them to return to the things that they had to give up because of pain.

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STEVE VAN DINTER: Now, what's he cutting out there? He's just kind of cleaning it up?

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RICHARD W. GLAD, MD: He's taking out really what are the residuals of the meniscus, which is a type of cartilage that's in the knee. And he -- you want to get all the soft tissue that has the potential for impinging in the joint out of there so that it doesn't get caught between the implant surfaces and generate pain.

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STEVE VAN DINTER: So that cartilage typically is all the way across? Or there's some smooth surface there?

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RICHARD W. GLAD, MD: Yeah, there's actually two types of cartilage in the knee. There's the meniscal cartilage, that's what he just took a little section of that out right there, which is really a C-shaped ring, where you have one on the inside of the knee, one on the outside part of the knee. And then there's the joint surface cartilage, and that's the articular cartilage that lines the end of the bone and really bears the weight of the joint. So that's similar to what you see when you look at the white on the end of a chicken bone. That's the joint surface articular cartilage, and that is really in this patient's case what really has worn down.

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STEVE VAN DINTER: Wow. I've got a question here from Cathy McGee, she says: I'm 54, am I too young for knee replacement surgery?

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RICHARD W. GLAD, MD: I don't think there's a specific cutoff age. In the past, I think people used to make the argument that you really want to wait for as long as you can before you do a knee replacement, but I think it depends on a person's level of disability. And you know, ideally, you wouldn't be doing this surgery until later, but at the same time, if you're so limited that you can't -- you have pain on a daily basis that prevents you from doing the things that you want to do, then if it's sufficiently severe enough, doing a joint replacement becomes a reasonable consideration.

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STEVE VAN DINTER: And why would -- what would be some reasons why you'd want to wait.

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RICHARD W. GLAD, MD: The concern about any joint replacement that gets done is you're always worried about the longevity of the implant. You want this implant to last as long as you possibly can, and obviously the earlier the age that you put it in, the greater the probability that with an active lifestyle, parts are going to wear. And one can always go in and revise a knee, but I will tell you the surgery to revise a knee is markedly more difficult than doing it the first time around. You can see how Dr. Wolff is checking the knee here with what's called a spacer just to confirm the balance of the soft tissues to make sure that the knee is balanced both as the knee is extended but also when it's flexed. And then we have a variety of different alignment guides here that just assist in making sure that the implant, as it's being put in, is going to be aligned correctly.

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STEVE VAN DINTER: Certainly. Now, what type of anesthesia is used for this type of procedure?

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RICHARD W. GLAD, MD: Well, that also varies, and it depends on the individual and their overall health and their own preference, too. There's a lot of people that just say, you know, "Put me out, I don't want to know anything that's going on during the surgery." And a general anesthetic is a very reasonable and a safe way to approach this. The anesthesia doctor will always talk with the patients before the surgery to help them select the type of anesthetic that they may want. Spinal anesthetic or epidural anesthesia is an option, and there's a variety of different nerve blocks that can also be utilized to help pain management both during and after surgery.

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STEVE VAN DINTER: Now, for folks watching this at home, you're seeing yellow, which is obviously the skin. It looks a little different than we typically see. What is on that?

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RICHARD W. GLAD, MD: Yeah, there's a material on -- that covers over the knee called an Ioban. It's an adherent dressing that's got iodine incorporated into it, or an antiseptic incorporated into it. And so it's just another one of the things that can be used to minimize likelihood of infection. You can see, you know, how we talked earlier about going back to be able to revise a cut, it looks like he's preparing to revise a cut and take a little bit more off the tibia so that those tissues will balance better as the knee is placed through a range of motion.

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STEVE VAN DINTER: So what other steps are we going to see here?

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RICHARD W. GLAD, MD: Well, there's going to be -- ultimately he's going to get to the point where he's going to place what are called trials or provisional implants in, and those will be the exact same size as the final product and just allows you to put them in to be sure that when the final implant goes in that it's going to perform exactly the way you expect it to.

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STEVE VAN DINTER: Obviously today we're looking at a knee, but one of our viewers asked: do you ever do ankle replacements for osteoarthritis?

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RICHARD W. GLAD, MD: There are ankle replacements. They traditionally have not been effective -- as effective as knee replacements. And the bone stock that one deals with in the ankle is traditionally not quite as good as in a knee, and so the longevity of the ankle replacements has not been as good -- track record has not been as good with ankles. And there are some other options such as ankle fusions that have been a very effective way of managing arthritis in the ankle joint. There are ankle replacements that are becoming more popular now, though.

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STEVE VAN DINTER: Typically, though, it is the knee that is most common?

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RICHARD W. GLAD, MD: The knee, by far, is most common. Hip replacements are second -- the second most common joint replacement, and then probably followed by shoulders. But there are joint replacements for multiple joints: elbows, shoulders, finger joints can be replaced.

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STEVE VAN DINTER: That is just amazing. What -- another viewer asks: what kind of joint surfaces other than cobalt chrome are currently available?

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RICHARD W. GLAD, MD: Well, the metal -- the metal in this particular implant is going to be a combination on one side of cobalt chrome and on the other side a material called Tivanium. It's basically a titanium alloy. And that's going to be the metal surface. And then between the two metal surfaces, there's going to be what's called a highly crosslinked polyethylene liner. It's going to be the polyethylene bushing that the metal tracks on and it creates the low-friction gliding surface that really replaces the joint surface cartilage. And that's probably -- that material, the polyethylene liner, the improvements in the polyethylene liner I think is really one of the biggest advances in joint replacement, because we now have materials that have much better wear characteristics, and they really allow for at least the expectation that the newer joint replacements are going to have a much better longevity than some of the implants that we used in the past where wear of the polyethylene liner was a big problem.

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STEVE VAN DINTER: We talk about longevity, you talk about putting it in and letting it -- hopefully -- sit in there for 20 or more years. Chris Turner says that he's heard of joints lasting as long as 20 to 30 years and wondering if that's more a myth than it is in fact a fact.

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RICHARD W. GLAD, MD: No, I think there's certainly joint replacements that last every bit as long as that, and I think that what is clear is that a joint that is placed in proper alignment with good materials has a much better chance of lasting that long. And I think with our newer implants here that the longevity of the implants is going to continue to improve. The problem is on an individual basis, when you talk to a certain individual, it's impossible to predict for that individual how long a joint replacement is going to last.

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STEVE VAN DINTER: And factors involved in that probably activity, how well the joint was put in?

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RICHARD W. GLAD, MD: Exactly. I mean, overall patient health, their size, their body mechanics, their conditioning, their ability to participate in a rehab program, there's a -- there's surgical factors and then there's patient factors that have some impact on longevity of the implant.

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STEVE VAN DINTER: So what are we seeing him do right now?

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RICHARD W. GLAD, MD: So now he's doing what are called the chamfer cuts. So these are going to be angled cuts that again are going to really precisely re-contour the end of the femur just to match the inner portion of the metal implant. And this is another one of the advancements in the instrumentation. These cuts that are all captured cuts, meaning there's -- really allows very little mistake or angulation in the saw blade. The design of these captured cuts have really improved the precision that they can be made in.

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STEVE VAN DINTER: Now we're just seeing him trim away some of that bone again. Bonnie said: it looks like the bone can be trimmed pretty easily. She thought it would be harder to trim.

00:31:02

RICHARD W. GLAD, MD: Well, people have tremendous different -- difference in bone structure. And there are times, especially in somebody that's a rheumatoid patient like this patient, their bone typically is very soft. You get a young person that's got significant mechanical wear in their knee, it can be quite hard. The other thing is the saws that he's using are -- they're very easy to use. You use a different saw blade on each patient, they're very sharp, and it again obviously allows for excellent precision in cutting.

00:31:41

STEVE VAN DINTER: Now, I've got another viewer question here asking about minimally invasive total knee replacement. What exactly is that?

00:31:49

RICHARD W. GLAD, MD: That means different things to different people. There are a variety of different approaches that allow one to do smaller and smaller exposures, and I think that if you look at the incision that's utilized here, although it looks relatively big on this view, quite honestly it's much smaller than incisions that used to be used. And so minimally invasive just to me means that you're using the smallest surgical incision, the least amount of soft-tissue dissection that still allows you to do -- get the implant in in the proper position. I think it's a tremendous mistake for people to think that the smaller the incision the better the surgery. I think it's clear that -- that getting the implant in in the absolutely correct position is critical to the outcome, and if somebody has an incision that's a little smaller, you know, in the long run, it is not going to affect the outcome. What really affects the outcome is being certain that you get that implant in and in a good spot.

00:32:55

STEVE VAN DINTER: I'm glad you said that, because I think that is a misconception that a lot of people have.

00:32:59

RICHARD W. GLAD, MD: It is. There's a lot of scar comparison that occurs between patients.

00:33:04

STEVE VAN DINTER: Now, is this that temporary piece you were talking about?

00:33:05

RICHARD W. GLAD, MD: This is -- this is called the tibial trial. It's being sort of provisionally held with these pegs that go in, but it is an exact replica of the tibial implant that will ultimately go in there. And this is one that allows now to create a hole that's drilled down into the bone that's going to accommodate a stem that's attached to the tibial implant.

00:33:29

STEVE VAN DINTER: Now, why put something temporary in there first? Why not just put the actual implant in?

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RICHARD W. GLAD, MD: Well, really, this temporary implant allows you to -- you can see that it has guides on it that allow you to place these punches down into the bone in a very accurate way. So it basically creates a cruciform or cross-type opening in the top of the bone, and that's what's going to be attached on the stem of the implant. You can see that there's a stem that goes down there on this trial. And so that provisional trial that was pinned in there allows you to position that in a very specific manner because you have to get this in in the correct rotation.

00:34:08

STEVE VAN DINTER: Now, obviously, we've got folks watching today who may be contemplating going through this procedure, but more than likely folks who've already had this procedure done, what's one or two things that you tell your patients to do that can make their recovery a smoother one?

00:34:21

RICHARD W. GLAD, MD: Well, I -- I certainly think that physical therapy is a critical factor, and you can do the best operation in the world, if people aren't compliant with doing the therapy, they're going to be unhappy with the outcome. And people recover at a different pace. I've had people that have come back to my office as quickly as two weeks and they're walking without a cane, and honestly, they're -- it's remarkable how well they're doing. And then the next patient that you may have done the same day comes back, and at six weeks they're still struggling a little bit. And so it can vary from one person to the next, but again, the physical therapy is critical. So you can see, he's placing in a trial spacer here. This is -- this is the spacer that's going to be made out of polyethylene, and you can see it's got a post on it, and that post is really designed to compensate for the absence of the posterior cruciate ligament.

00:35:22

STEVE VAN DINTER: This is just amazing. So they're going to put that in and see how well those two come together, is that right?

00:35:26

RICHARD W. GLAD, MD: Yep, yep.

00:35:27

STEVE VAN DINTER: Wow. How difficult a surgery is this? You've been doing it for a couple decades now, but to learn it, how difficult is this?

00:35:36

RICHARD W. GLAD, MD: Well, obviously there's a learning curve on it. I think that the instrumentation has really helped. It's made things go a lot smoother. Clearly, experience makes a difference here. And really the combination has gradually made this an easier operation, but you can never underestimate it. It's -- you can't go into any operation thinking it's just going to be a chip shot, because you're going to end up getting frustrated here, frustrated at some point, because even situations where you expect it to go as smooth as can be and you have no reason to think it's going to be a problem, if it doesn't come out perfect you get really frustrated. So each operation is a new experience, and you need to be prepared for all possibilities when you go in.

00:36:27

STEVE VAN DINTER: Now Bob's got a good question here. He said: do you recommend two knee replacements at the same time if you need them, or do you do one now and then wait and have another one later?

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RICHARD W. GLAD, MD: I think -- I think that varies as well. I think there are candidates for bilateral knee replacements that are good candidates for it, but I think there are certainly situations where it's not a very good idea. I think the older the people are, the more debilitated they are, the greater health problems that they have, the less likelihood that they're going to really be able to tolerate both knees being replaced at one time. It takes a lot more effort. You have to remember that if you did bilateral knee replacements, then when you're doing your rehab, you need to have the stamina that once you're done doing the exercises on one knee, you need to be able to do it on the other. And there are certain situations where that can be accomplished, but I would say more often than not, I caution people against it. I really think that it's a lot of surgery, and it's only appropriate in certain situations.

00:37:33

STEVE VAN DINTER: So once you've been told as a patient that you're essentially bone on bone, is there any advantage to waiting until you just can't bear the pain anymore?

00:37:42

RICHARD W. GLAD, MD: You know, it is interesting here. You can see patients that have a terrible knee, for example, this individual has had a terrible knee and it's really been an awful-looking knee for a long time, and yet he's been able to withstand it and tolerate it. And I think as long as people's function is not too impaired, I normally will just tell them to tolerate it. On the other hand, I certainly have seen people with far less wear than what this individual has, yet they're debilitated enough that they opt to go ahead with the knee replacement because they're functionally limited. So you can't operate just on the x-ray alone. The x-ray gives you an idea, but if you look at this individual's x-ray, you would've predicted that he would've had a knee replacement done long ago.

00:38:30

STEVE VAN DINTER: Now, what was that device he was just using there? I saw some sort of sparks or something like --

00:38:34

RICHARD W. GLAD, MD: That's called a Bovie. It's an electrocautery unit that can both cut the soft tissue and then cauterize the bleeders simultaneously.

00:38:45

STEVE VAN DINTER: And they're doing something with the kneecap right now.

00:38:47

RICHARD W. GLAD, MD: They're going to -- this is a device that is going to plane down the surface of the kneecap to a very flat surface and takes off a specific amount of bone so that he can place a new surface on the kneecap as well, and you can see how precisely that has trimmed that bony surface down.

00:39:06

STEVE VAN DINTER: So there will be another artificial piece that goes on that.

00:39:07

RICHARD W. GLAD, MD: Exactly.

00:39:08

STEVE VAN DINTER: Okay. That's amazing. Ted asks, actually, he's 60 years old, he's undergoing a second round of shots for his knee. He says it doesn't really last, though. He's wondering, should he consider surgery, because the pain is really bad, especially after he gets done walking, things like that at night.

00:39:24

RICHARD W. GLAD, MD: Well, you know, this is really -- it's really a decision that the individual needs to make, and you know, if he has -- first of all, I would not -- I do -- I will inject a knee several times before going ahead with a knee replacement, but I think it is a mistake to do repeated cortisone injections just because it can have some impact on the quality of the bone structure. And again, you have to remember that the bone is the foundation that you're going to put this knee replacement on. And people that have had numerous injections have -- their bone quality can deteriorate. So you can see, he's placed the knee through a range of motion, he's -- the kneecap tracked nicely. The artificial -- the tissues seem nicely balanced. And so he's releasing just some of the soft tissues off the back of the femur here that will hopefully improve flexion of the knee.

00:40:19

STEVE VAN DINTER: So we're getting pretty near him putting in the end piece, right?

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RICHARD W. GLAD, MD: Yeah, he's just cleaning out the last of the bone. And what he's ultimately going to do here is he'll use a pulsatile jet lavage unit. It's kind of a high-pressure irrigation system that's going to wash off the end of the bone, that's going to wash all the fat and tissues out from the bony surfaces, and it's going to expose that sort of spongy surface of bone that is going to allow the bone cement to attach to. And it creates a much stronger bond.

00:40:58

STEVE VAN DINTER: Now, when they attach this bone cement you're talking about, how long does it take to set? I'm assuming there's some sort of period where you have to let it sit there.

00:41:04

RICHARD W. GLAD, MD: Yeah, it usually takes, oh, somewhere around 10 minutes. It's remarkably dependent on room temperature. And the warmer the room, the faster it's going to set up.

00:41:14

STEVE VAN DINTER: And then after that, you're pretty much ready to seal the knee back up?

00:41:15

RICHARD W. GLAD, MD: Well, once -- once the -- once the implant is cemented into place, it is as solid as it's going to get. And at that point, you can check tracking of all the soft tissues and then wash it out and close it.

00:41:32

STEVE VAN DINTER: But other than like you were talking about earlier the ACL, the PCL, these are pretty -- everything else is pretty much intact. You haven't cut through a lot of things.

00:41:38

RICHARD W. GLAD, MD: No, you really -- you work between the planes of the tissues, and so you're -- you basically split them along the lines of their fibers and you don't cut them transversely.

00:41:53

STEVE VAN DINTER: Interesting. We talked earlier about recovery. I want to go back to this a little bit, too. Is there certain phases that people go through in recovery, for one, and two, would you say that the patient has to be just as involved in the surgery as the surgeon that performs it?

00:42:11

RICHARD W. GLAD, MD: Well, there's no question. I think there are phases that people go through. You know, there's certainly a frustrating phase initially here where people want to get better fast. You know, you want to get back doing the things you -- there's a lot of concern and anxiety going into an operation, and once it's over, there's a little bit of a letdown, so sometimes it does take people a while. I think motivation is clearly important, and people do need to stay motivated and be prepared to work hard on their rehab. Quite honestly, though, as people go to rehab centers, frequently they see other patients that have had this same operation and everybody, like I said earlier, they compare scars, they compare their rehab and where they are. And everybody wants to have the best outcome, so typically most people work pretty hard at it.

00:43:04

STEVE VAN DINTER: Now, you were talking earlier about people who are choosing to wait to have this procedure done. If this gentleman would've waited longer, what sorts of things -- how does this progress further on, this disease?

00:43:14

RICHARD W. GLAD, MD: Steve, just before we get to that here, Jimmy, the tech here, is mixing the bone cement. That's mixed off the table. And at this point, they're irrigating the surfaces really to get all the fat out of the cancellous or spongy bone. And that's what the -- that's what the cement is going to get anchored to. As far as waiting, you know, what can happen, the concern is that as time passes, you can get progressive deformity into a knee joint. If I can -- can I switch over, show those photos here? Is that x-ray being projected then?

00:43:51

STEVE VAN DINTER: Not yet, no.

00:43:53

RICHARD W. GLAD, MD: Okay. Okay. If you look at this x-ray here, you can see that this is marked deformity. This is called valgus deformity, very knock-kneed. And patient didn't start like this, but as time progressed, this angular deformity developed, and people really don't like that. It's very noticeable. And you can see that when you put a joint replacement in, you can correct that. And that's really one of the advantages here.

00:44:17

STEVE VAN DINTER: That is amazing. That -- I mean, that right there is clear difference into pre- and post-surgery.

00:44:21

RICHARD W. GLAD, MD: But that is the concern. And people that wait a long period of time, the amount of deformity can continue to gradually increase. And obviously, the greater the deformity, the harder it is to get soft-tissue balancing, to get the implant in in a good position, and it just becomes technically a more difficult operation.

00:44:42

STEVE VAN DINTER: Now, eventually would the patient be unable to walk?

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RICHARD W. GLAD, MD: Well, people can reach that point where it gets so bad that they -- that walking is very difficult. And you can see here now, Dr. Wolff has the bone cement here and he's getting ready to put it on the surface.

00:44:59

STEVE VAN DINTER: Is that dabbed on or is that poured on, how does that get in there?

00:45:01

RICHARD W. GLAD, MD: It's kind of poured on. It starts in a very liquid phase, and then it becomes sort of a putty. And then as time passes, it will get rock-hard.

00:45:13

STEVE VAN DINTER: So he's getting ready to pour that on right now.

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RICHARD W. GLAD, MD: Yeah, he's just getting some -- there are just some little cysts in the bony surface here that he's...

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STEVE VAN DINTER: So he'll just apply that on, spread it on here?

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RICHARD W. GLAD, MD: He's just going to take a gob of it. There's a spatula there that he's waiting for it to get to the consistency that he likes.

00:45:35

STEVE VAN DINTER: Now, this is pretty much towards the tail end of this surgery then, correct?

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RICHARD W. GLAD, MD: It's getting there. And he's -- what's going to happen there is he's going to -- you're going to see a lot of things moving here fairly quickly here, because there is a certain time frame because once this cement hardens, you can't do anything with it. So there's a period of time here where you can see he's got the cement in there now, he's going to put the final implant in. So that's the final implant that's being packed down, and the excess cement is then extruding around the outside. And the next step is going to be to remove all that excess cement here.

00:46:08

STEVE VAN DINTER: That seems to pop off pretty easily right now.

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RICHARD W. GLAD, MD: Yeah. As long as it's kind of in a putty phase, it's relatively easy to take off. And there's a variety of different instruments. There's different types of spatulas and things like that that one can use to remove it.

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STEVE VAN DINTER: Almost looks like it's the consistency of frosting.

00:46:23

RICHARD W. GLAD, MD: It's very close to that.

00:46:26

STEVE VAN DINTER: I've got another question that's coming in right now asking: what is involved with a partial knee replacement. Obviously, looking at a total knee here.

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RICHARD W. GLAD, MD: Yeah, this is a total knee. A partial knee replacement is one where you're just doing half of the joint. It's really only a viable option in people that have localized wear. Most people that you see, the vast majority of the people that you see have wear in more than one area of the joint. So they really are not candidates for partial knee replacements. But in that situation where people have just a very localized area of wear on either the inside or the outside part of the knee, then a partial knee replacement becomes an option.

00:47:05

STEVE VAN DINTER: Now, do you ever perform the surgery, a viewer asks, going laterally as opposed to what we're seeing right now?

00:47:12

RICHARD W. GLAD, MD: This is a basic anterior midline approach is what he's using. It is probably the most commonly used approach. There's -- there's various different types of soft-tissue-splitting approaches that are an option. It really becomes surgeon preference. It's based on experience and training. I would have to say that from my point of view, this is the approach that gives the best exposure. I have talked to people that have really compared, using identical implants, compared approaches straight midline or what's called vastus, sub-vastus approaches, which is through one of the muscle bellies. And early, the one may have a slightly quicker recovery, but if you look at people beyond six weeks, the recovery ends up being pretty identical.

00:48:10

STEVE VAN DINTER: So we're seeing that final piece being put in place here?

00:48:12

RICHARD W. GLAD, MD: Yep, so the femur's in, the tibia's in, he's now placing just a trial polyethylene in there now so that he can check range of motion. You can see, the leg comes out nice and straight, and yet at the same time, when he stresses it from side to side, it's nice and stable.

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STEVE VAN DINTER: Looks pretty good, then, at this point.

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RICHARD W. GLAD, MD: It looks excellent.

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STEVE VAN DINTER: So the final step then will be?

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RICHARD W. GLAD, MD: The final step will be -- again, he's checking the alignment here. The final step is going to be to remove that -- that trial spacer and to put in the final polyethylene. Oh, he's going to glue the patella in here first.

00:48:49

STEVE VAN DINTER: And that was that kneecap thing you were talking about earlier.

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RICHARD W. GLAD, MD: Right, the undersurface of the kneecap.

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STEVE VAN DINTER: Sure. That is just amazing. Now, how have you seen progress - - things progress through the years? Has the technology changed for you?

00:49:03

RICHARD W. GLAD, MD: I think there's been really two areas of improvement. I think the design of the implant has improved quite dramatically and more accurately mimics the contours of a person's normal knee. So the implant, there's the design implant, there's the materials that are used that have hopefully better wear and better longevity. And then there's the implant -- the instrumentation for implanting these, which has improved quite dramatically as well.

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STEVE VAN DINTER: Are they getting smaller, are more sizes available, is there any changes in that?

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RICHARD W. GLAD, MD: Well, like I said, there's far more sizes and far more modularity and flexibility than in implants of even 15 or 20 years ago. But pretty much now -- and there are the standard materials that are sort of off the shelf, and any individual -- in any individual where the standard off-the-shelf implants don't fit, you can always get custom implants as well.

00:50:14

STEVE VAN DINTER: Now, are we waiting for this cement to set at this point?

00:50:16

RICHARD W. GLAD, MD: Yeah, exactly. You're waiting for the cement to set, and he just told the person in the room that he can go get the 10-millimeter implant, because that's the -- that's the size of the tibial tray. So at this point, he's really waiting for the cement to harden. So there's going to be kind of a little downtime at this point.

00:50:34

STEVE VAN DINTER: Well, you know, and I think the great thing about this total knee replacement is after the surgery, you know, patients tell me that you can pretty much feel as good as if you were young. In fact, many patients are reporting being able to painlessly walk, run, even do things like playing tennis. And we've got a local tennis star in town named John Powless who had both of his knees replaced here at St. Mary's a few years ago actually by you, and he's living proof that this surgery works. And if we can, would like to take a look at him.

00:51:03

JOHN POWLESS: The overall wear and tear of football and basketball over the years took its toll with it, and then the discomfort became so great I really couldn't run. And the freedom to move about. And that was -- that was the time to have serious discussions with Dr. Glad, who was tremendous through all this. My objective really to get this done was to relieve that discomfort. And if you want to call it pain, you can call that, whether it's bone on bone or your knees are just totally worn out. And that was -- that was one. The other was I wanted to get back to be competitive worldwide to play, and that's also what I do as a living. And not being able to move was a major factor. You still have got to be mobile in everything you do, and that's where you have difficulty getting in and out of a car, going up and down steps. It doesn't matter -- taking things out of the house that aren't supposed to be there, bringing things in. But when you're trying to sleep at nighttime and you roll over in a certain position and your knees wake you up, then you know something's not right. They check you in, normal formality, a full explanation about what's going to happen in pre-, what's going to happen, and then Glad tells you what's going to happen when he goes in, and then in post-, they're going to tell you in recovery, "we're

going to have you there and then we're going to move you up to your room." I mean, everything was so organized and step by step, and everybody was so sincere, as if you were there alone and they were going to take care of you. The physical therapy, the very morning after surgery, which we'll say the first time was Wednesday morning. They came in, I'd had my breakfast, and they brought in this little four-wheel component for me to hang onto, and I walked down to the rehab for my first treatment. Then I went to the rehab center, that happened afterwards, which was the same area rehab area. And there's where it goes a little bit farther. I mean, the daily walking to where -- I got up to where I was walking about a mile every morning and walking about a mile every afternoon, whether it was on my own or with them. It was with them initially because they're right there with you every step of the way. It's a world of difference, because I couldn't run at all. One, getting out of steps free of hands on railings. That I couldn't do. Getting in and out of the car with the freedom from discomfort, basically pain with the knees, all those are relieved. I'm able to do normal things and, yes, you have still recovery time, you still need to do your exercises, but you're basically pain-free with this. Before, it was miserable. Just because I couldn't do the things I wanted to and it bothered me. And afterwards, it was -- the first time I could actually take with a crutch to protect myself and hit a ball against a wall, have somebody just feed one out to me, which I was allowed to do, mentally it was so refreshing. It just changes your life totally. I mean, it's the -- there's nothing like it, nothing to describe the feeling about how bad it was before to how good it was afterwards.

00:54:35

STEVE VAN DINTER: And what an inspiration that man is. I had a chance to talk with him before that story, and he's just amazing to see his recovery. 75 years old, he's still out hitting tennis balls, running across the court, as you just saw. And all thanks to you.

00:54:49

RICHARD W. GLAD, MD: Well, I'd like to take all the credit, but quite honestly, he's a world-class athlete, and he worked harder than anybody I've ever known in his rehab, and that's really largely responsible for how well he's done, and he's incredibly motivated. And so he's just a fun person. I wish everybody that I operated on did as well as he does.

00:55:10

STEVE VAN DINTER: I think what really surprised me about him, too, was the fact that he was telling me you've got to put in as much as the doctor does. He said he was out there in a pool at 40 degrees swimming because he knew he felt so good to exercise and do rehab. And he told me that's what patients need to do.

00:55:25

RICHARD W. GLAD, MD: Well, I'm sure he was doing all that. And I don't think everybody needs to necessarily work as aggressively as he did, but it is critical to the outcome that people are diligent, they work hard on getting their range of motion back. It's not easy, but you know, ultimately people that are compliant typically will have a very good outcome. Most people with the knee replacement, I would have to say, there are certain individuals like John that really will say they've had complete pain relief. Most people will still say it doesn't feel quite like a normal knee, they will still have intermittent discomfort with it, but you can imagine somebody like the patient today that is completely down to bone on bone, that is so painful that even partial correction of that pain is just a tremendous relief.

00:56:13

STEVE VAN DINTER: Well, let's jump back into the operating room right now, where Dr. Wolff is just finishing up the procedure. We'll see if he has some final thoughts for us. Dr. Wolff?

00:56:24

DAVID A. WOLFF, MD: Yes?

00:56:25

STEVE VAN DINTER: How are you doing?

00:56:26

DAVID A. WOLFF, MD: I'm doing well.

00:56:27

STEVE VAN DINTER: Surgery looks like it went pretty well.

00:56:29

DAVID A. WOLFF, MD: Yeah, things went well. You saw we had to make a little adjustment there early. He had such a loss of bone from the upper surface of his tibia here that I couldn't tell exactly where the right level was, so we made that first cut, and of course, you always figure you can take more if you have to, it's hard to put it back. So I was a little conservative at first, and we had to go back and take a couple more millimeters to make it fit right, but after that, everything was just fine. So we did a little adjustment there, and I think it balances out perfectly. We're just waiting for the last bit of cement to harden up here, and then we know we can be confident to move this around, that we won't dislodge anything.

00:57:01

STEVE VAN DINTER: And then you were just -- all you've got to do is sew that up, right?

00:57:04

DAVID A. WOLFF, MD: We're going to put this final piece of plastic in, and we'll show you that right now, and then we'll be able to sew up. Pick ups, please.

00:57:13

STEVE VAN DINTER: So you're pretty much in the home stretch.

00:57:14

DAVID A. WOLFF, MD: Yes, we are.

00:57:17

STEVE VAN DINTER: I've got a viewer question that I'm wondering if you could answer for us, otherwise Dr. Glad might be able to help us, but Mary asks: is there an implant that's specifically designed for the female knee, or are all of these implants the same?

00:57:28

DAVID A. WOLFF, MD: There are implants that have been designed for -- that are gender-specific, designed to fit a female knee better. Typically a female knee's a little narrower. A little narrower through here, so you can get a narrower implant. There's not a lot of good science yet that says that that's a real worthwhile thing to do. It certainly maybe fits a little bit better, but whether or not the results are better still remains to be seen. And so there are some that are designed for women, yes, but -- push the tibia forward. Behind it, push in -- but they're not widely used yet. Some people are using them a little bit, I have used them. I don't use it all the time.

00:58:08

STEVE VAN DINTER: Certainly. Well, you sure made this procedure look pretty easy. One of our viewers also was wondering: how many total replacement patients do you see in a typical day? Is this typical just to have one, or would you have a few of these?

00:58:19

DAVID A. WOLFF, MD: Oh, I usually do four a day. All right, wash. We're just going to sew up now. Everything's in.

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STEVE VAN DINTER: That's great.

00:58:26

DAVID A. WOLFF, MD: You saw, we checked the balance, made sure everything worked like it's supposed to, and it does. Kneecap goes down the middle like it's supposed to, so everything's looking right.

00:58:33

STEVE VAN DINTER: So what are you guys doing right there, that liquid that's going in?

00:58:35

DAVID A. WOLFF, MD: We are washing this with an antibiotic saline solution to hopefully wash out any possible contamination and clean any debris out, and this is a pulsatile type of irrigation. So I'll make sure we get everything cleaned out of here, and hopefully if any bacteria got in, you know, the air is nice and clean in here and we've got lots of sterile instruments, but occasionally a few are in the air, and you try to make sure all of them are out or you wash them out. And then we'll be ready to close up.

00:59:03

STEVE VAN DINTER: Well, looking good there. Do you have any final thoughts before we pop back in here?

00:59:05

DAVID A. WOLFF, MD: I don't. I leave that up to Dr. Glad.

00:59:07

STEVE VAN DINTER: All right, well, thanks so much, Dr. Wolff. We appreciate it. And what I want to show here is -- real quick, if we can take a look, we've got a model of a knee, and I wanted to show the viewers at home exactly what we saw happen here today.

00:59:21

RICHARD W. GLAD, MD: Basically what you saw is that Dr. Wolff made an incision over the front of the knee, he flipped the kneecap off to the side, he used a guide system that allowed him to trim off the top surface of the tibia and then to re-contour the end of the femur so that it had this very angled five-sided contour. He then placed provisional trials on there that mimicked the artificial knee just to check the balance and the motion and the tracking of the knee replacement. Then he washed off all the surfaces, placed polymethylmethacrylate, which is a bone cement, on, and then glued the implants into place. And all along during the entire procedure, continued to check alignment, check the soft-tissue balance, make sure the tracking was good. And he has now gone from having a bone-on-bone surface to have a metal implant off the femur, a metal implant off the tibia, and this very low-friction gliding surface that sits between them that acts as a bushing that really creates a new weight-bearing structure for the joint.

001:00:30

STEVE VAN DINTER: And before we go here, we've got a couple of those joints that we had talked about before, the artificial ones. I just want to show quickly the viewers the difference between the technology from 20 years ago and stuff we're seeing about today.

01:00:40

RICHARD W. GLAD, MD: There -- the differences are subtle, and if you look at the two implants, there doesn't look like there's a tremendous amount of difference, but this is actually one of the older implants. It's symmetric both on the inside and on the outside, and so it's the same as a right and a left. The newer implants now have a much more normal contour, much more rounded surface, a much more normal femoral groove here where the kneecap is going to track in. And you can see, it's higher on the outside than it is on the inside so that the tracking of the kneecap ends up being much more normal. And really, once you place it on a -- a metal surface that has this polyethylene liner between the two, this post it sits on here can

-- basically replaces the posterior cruciate ligament. Not all implants are like this. But it allows for normal tracking in the knee joint, it comes to a stop so that it can't hyperextend, but it also allows just some subtle rotation which really mimics normal motion of an artific-- of a normal knee.

01:01:41

STEVE VAN DINTER: Well, that is just some amazing technology. I think we're all glad for the stuff -- the work that you, Dr. Wolff, and all the rest of the orthopedic surgeons here at Dean and St. Mary's do. And any final thoughts before we head out today?

01:01:53

RICHARD W. GLAD, MD: Well, actually I would have to say that this is just a tremendously gratifying operation to do. You take people that are so debilitated oftentimes and put a knee replacement in, they come in, they are the most grateful people that you see. And so it generally is a very satisfying operation to do. It's fun to do, you're working with fun people, we have a beautiful facility now that is just state of the art, and so you can't help but enjoy doing it.

01:02:24

STEVE VAN DINTER: Well, thank you so much for joining us today. And thank you, the viewers, for joining us for what we hope was an informative and interesting webcast. I know I had a great time watching it, I hope you did here at home. This has been a total knee replacement live from St. Mary's Hospital in Madison, Wisconsin. I'm Steve Van Dinter. On behalf of Dr. Glad, Dr. Wolff, and all the rest of us here at Dean and St. Mary's, good night.

01:02:53

ANNOUNCER: This has been a demonstration of a total knee replacement surgery performed live from St. Mary's Hospital in Madison, Wisconsin. OR-Live makes it easy for you to learn more. Just click on the "Request Information" button on your webcast screen and open the door to informed medical care.

01:03:20

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