MINIMAL INCISION TOTAL KNEE REPLACEMENT
ALLIANCE HOSPITAL
ODESSA, TEXAS
January 23, 2007

ANNOUNCER: Over the next hour, live from Alliance Hospital in Odessa, Texas, see a minimal incision total knee replacement. Dr. William Reilly, Director of BOSS Arthritis Institute, is performing this relatively new procedure. Some of the many patient benefits of this surgery are smaller incisions, faster recovery, less soft tissue trauma, and less pain. Since there is a minimal soft tissue disruption, many patients are able to get up and walk the same day of the surgery.

ANNOUNCER: During the procedure you can email your questions right to the O.R. by clicking the MDirectAccess button at any time. Now let’s go live to the operating room.

JAMES BLAIR, MD: Greetings, and welcome. We are coming to you live from Alliance Hospital in Odessa, Texas. Today we will be performing a minimal incision total knee replacement. I’m Dr. James Blair, Chief of Anesthesia at Alliance Hospital, and joining me today will be Dr. William Reilly, who will be performing the surgery. Before we go to Dr. Reilly, I have a few housekeeping items that we need to go over. First, Dr. Reilly and I will be answering questions about the surgery from the viewing audience later in the webcast. To send your questions now, just click the MDAccess button on your webcast screen. We are welcoming your questions and we’ll try to answer all of them. I’d also like to turn things over to Dr. Reilly at this time so he can introduce our operating room team. Dr. Reilly?

WILLIAM G. REILLY, MD: Good evening, and welcome to Alliance Hospital. I’m Dr. Bill Reilly. I’m going to be performing this procedure tonight along with my fine surgical crew. Total joint replacement really is a team operation, and I think we have one of the best teams in the country. Standing beside me here is Casey. She’s our physician assistant. She helps out not only in the operating room but also as a very important part of our postoperative patient care. Across the table we have Wes; he’s our surgical assistant. He’s the first licensed surgical assistant in the United States and holds license # 001. Gladys is going to be our scrub person; she’s going to be passing us the instruments. Gladys started out here at Alliance as a scrub tech and at night went to school. She’s now an RN nurse working on her bachelor’s degree at night. Cindy’s our circulating nurse. You can’t see her, she’s in the background here, but she’s also very important. She brings us the things we need when we need them. Karen’s going to be performing our anesthesia; she’s a nurse anesthetist and has been here at Alliance and does excellent work for us. She’s working under the direction of Jim Blair, who already introduced himself to you. He’s not only our Director of Anesthesia, but he manages our perioperative pain program, which really is just as important as the surgical procedure you’re about to see in terms of keeping our patients comfortable, getting them up, getting them moving as quick as we can. And of course the
most important person here in the room is the patient, and that’s why we’re all here. This is a very pleasant 73-year-old female who’s been having left knee pain now for quite some time. The pain’s gotten progressively worse. Originally she was on some arthritis medicines which partially helped to relieve the pain, but she developed significant ulcer disease and couldn’t take anti-inflammatories. Oral pain medications aren’t helping the pain. She can’t do the type of things she wants to do. She’s decided to have her left knee replaced, and that’s what we’re going to do tonight. Over on the view box you can see her x-rays. I just want to say that she went to Colorado about four years ago and another surgeon performed a unicompartmental knee arthroplasty on her. She’s having a little bit of problems with that. And all I want to say is, to the orthopedic surgeons watching this, that the x-rays sort of speak for themselves. As far as her left knee is concerned, she’s pretty much lost all the joint space in the medial compartment. With follow-up x-rays, she’s had progressive loss also in that lateral compartment. She’s not a candidate for a uni, and we’re going to go ahead and do a total knee replacement on her tonight. Over on the view box you can see her x-rays. I just want to say that she went to Colorado about four years ago and another surgeon performed a unicompartmental knee arthroplasty on her. She’s having a little bit of problems with that. And all I want to say is, to the orthopedic surgeons watching this, that the x-rays sort of speak for themselves. As far as her left knee is concerned, she’s pretty much lost all the joint space in the medial compartment. With follow-up x-rays, she’s had progressive loss also in that lateral compartment. She’s not a candidate for a uni, and we’re going to go ahead and do a total knee replacement on her tonight. Now, we’re going to demonstrate the minimal incision technique, which in simple terms is just doing a total knee replacement through the smallest soft tissue envelope that we can safely use, standard alignment techniques using downsized instrumentation. This is a procedure that the community guy who does 20-40 knees can adopt because we’re going to – in this particular instance, we’re going to do a small quad, a split here, mobilize the patella laterally and not evert it. And by using downsized instrumentation, if you have a good anesthesia department that can manage your perioperative pain, you can get these patients up on the day of surgery and get them out in the hospital in two to three days. So, we’ve already gone ahead for time purposes and – Can I have a ruler, Gladys? – and mapped out our incision here. We cut three finger breadths below the inferior pole of the patella, one above the superior pole. And usually that’s somewhere between 3-3/4 to 4 inches on a female, and on her this is about 3-3/4 inches. If you can see here, my thumb is on the 4-inch mark. So let’s get started. We make the incision with the knee in flexion, and that’s for several reasons. One is, as you get older, it’s a lot easier to see here. And the other is that the tissues sort of just fall apart on their own, as you can see here. Just going to expose a few things for you here. Okay. Now...coming up here. So I don’t know if you can see this, but my finger is on the superior medial pole of the patella, and this is a left knee, so I’m going to make the split here. I’m going to come up right next to the vastus medialis, and she’s got a lot of fluid in her knee. And we’re going to incise that only for about two centimeters on here. Case is going – Now, she’s got medial compartment arthritis, which means the soft tissues on the medial side of the knee are contracted. So what we’re going to do is a minimal release. Now, I’m using a rongeur here, and for the orthopedists out there, don’t panic yet because I’m grabbing the medial meniscus and that’s going to come out. So, with the varus deformity, we’re going to do just a slight release here initially, coming around the medial side of the knee. And we’re going to go right underneath the deep portion of the medial collateral ligament, come around back to the posterior medial corner, but not release a lot at this point. Bring the knee into extension. And I don’t know if you can see this, but this incision becomes a mobile window, and as you bend or flex the knee, that window moves and allows you access. Colcher [sp?] All right. This is the fat pad of the knee. It’s underneath the patellar tendon, and we’re going to get rid of part of that so it enables us to get that patella over more laterally. Okay. Come up to the top part of the knee and just cut out some of this. This is the synovium and the suprapatellar pouch. I used to try to save this, just split it, and even I used to repair it, but subjectively, I really didn’t see that much difference in terms of the patient’s being able to get up and move. Okay, so we can see the anterior cortex of the femur, which is going to help us size the knee out. Okay, out. Up. Yeah, okay. Now, let’s just tighten...Okay, let’s come back up again. Okay, let’s have a – Now, if you notice, here’s the undersurface of the patella. The old, standard exposure was about a 6- to 8-inch skin incision, and we would take this patella and turn it all the way over so the undersurface of the patella would be facing out. That puts a lot of stretch on the extensor mechanism, and
we want to avoid that. So, go ahead. So, we’re going to pull a little bit. Okay. Now, we can see the femur. And I don’t know if you can see this, but she’s got disease in both compartments of her knee. This is the medial condyle. The cartilage is all fibrillated and that’s exposed bone. She’s also got disease in the lateral compartment. So, punch? We take a punch to aid us in getting our drill in here. We want to be a little bit anterior-medial. We’re going to use an intramedullary alignment system, and we’re going to align off the anatomic axis of the femur. We’re going here. This is our alignment device. It goes up the femur. The distal portion is set at five degrees. Okay, and we’ll take 11 glavs [sp?]. So now we’re going to cut at five degrees of valgus. And by extending the knee, this window moves proximally so that I can get the exposure I need. Okay, Wesley? Okay, yep. Wesley’s putting in the pins. Okay. I’ll take a pin. Thank you. Okay, now, we’re cutting at five degrees and we’re going to take off just enough off the end of the bone that we’ll replace with metal. And since we’re taking the posterior cruciate, we’re going to take an additional 2 millimeters off here to allow for the difference in flexion-extension gap. Saw? Just want to make sure that we get the soft tissues protected. And her bone is not soft at all for somebody – Okay. Let’s take those off. We measure our distal resection here, give us an idea of where we are. Gladys will tell me what those numbers are. We’re going to check the cut again. Okay, medial is 10. Okay, we want to be in the 10-11 mm range, and that’s what we have. Okay. While Wesley’s taking this off, this is the intercondylar notch of the knee. Our anterior cruciate’s kind of chewed up a little bit there. We’re going to take her anterior cruciate. And there’s basically two types of knee designs: those that keep the posterior cruciate and those that sacrifice it. My personal feeling is God made the PCL, or the posterior cruciate ligament, for his knee and not for manmade knees, so we’re going to take it. Now, one thing I didn’t point out was, and I want to show you – Casey, show me the distal-femoral cutting guide again – is the size. If you look on the slide – but if you look at this, this is about half the size of the standard, and that allows you to make a smaller incision, because to get a wider piece in, you need a longer incision. So this is using standard alignment techniques with just downsized instrumentation. Okay, let me have a – let me have a – yep, let’s take this out here. Now we’re going to just pop this knee out a little bit here. We’re exposing the tibia because we’re going to make our tibial cut. We’ll use an extramedullary guide. Again, the patella is not going to be everted. Okay, and let me have a – let’s start out with a – the meniscal clamp, please. So what we’re going to do now is take out the lateral meniscus. And left knees are always harder for right-handed surgeons. Okay.

00:12:57
JAMES BLAIR, MD: Audience.

00:12:58
WILLIAM G. REILLY, MD: I’m having a hard time hearing you, Jim, but go ahead.

00:13:00
JAMES BLAIR, MD: We have a question from the audience. This person has emailed, “What was the reason for changing the technique to a minimal incision technique?”

00:13:12
WILLIAM G. REILLY, MD: Well, um, I could spend a lot of time talking on that one. We’re at a tough point in the case. But basically, there was a real interesting paper that was put out in the Mayo proceedings, and it looked at what patients really expected out of total knee replacements, because, you know, what a surgeon expects might be a little bit different than a patient. The two major concerns or major worries about people undergoing total knee replacement were, number one was the postoperative pain – and set it at 10, please – postoperative pain and their length of recovery. So, you know, the old, standard procedure is excellent and has excellent results, and the minimal incision techniques came along to address these issues of the pain and people getting up and moving quicker. Now, what we’re doing here is an external alignment device. I’m aligning on the center of the tibia. I’m going to cut perpendicular to the anatomic axis of the tibia. I’m going to take off about 9 or
10 mm of bone, and that’s about what we want to replace here. Okay. And Wesley, go ahead and pin that, please. Looks okay. All right. And again, this tibial cutting guide’s downsized, want to make sure you protect the skin. We’ll take this out. This cutting guide is also downsized. You can see we don’t have the part that’s going to go by the patellar tendon there. We want to make sure we don’t cut that. This on some knees can really be the hardest. Let me see if I can get a little better there, Casey. To cut over in the lateral aspect because it’s tricky. Okay, and we double-checked the alignment, we’ve got about the slope we want. All right. Saw, please. So this is a second important cut in the knee. Okay, can I see an osteotome, please? Take an osteotome here. Okay, so we’re going to take this off, still remains attached to soft tissues. And again, without everting the patella, this lateral side is really the trickiest part here. Cut through some ligaments, take this out.

00:15:37
JAMES BLAIR, MD: We have a question. This is directed toward anesthesia. While you’re working I’m going to try and field this one. This is a 74-year-old woman who says she’s in dire need of total knee replacement: “However, I am terrified of being put to sleep for surgery because of a bad experience. Can knee replacement surgery be performed with anesthesia of some sort, or perhaps an epidural or pain blocker? I appreciate any advice you give me. I am in constant pain, thank you.”

00:16:07
WILLIAM G. REILLY, MD: Well, Jim, you can answer that one. I mean, she’s watching it right now. Why don’t you go ahead and answer that one while we’re working away here, okay?

00:16:13
JAMES BLAIR, MD: In response to your question, it’s in fact very straightforward to produce an anesthetic that does not require that you go to sleep and have your airway managed or have anything really done to the upper portion of your body other than some sedation. We do this all the time, and in fact, the procedure that you’re watching behind you – or behind me – is in fact a procedure that’s been done with a spinal anesthetic. The patient has taken a nap with a small amount of sedation intravenously, she’s wearing a mask with a little oxygen on her face, and she’s –

00:16:55
WILLIAM G. REILLY, MD: Jim, can I cut in here, because we’re at a very important place that I need to get here to continue on? And I’m sorry, but I want to move along here. But right now there’s two gaps in the knee: there’s a gap we create in extension, gap we create in flexion. This is an 8-mm spacer. So with an 8-mm spacer in there and the femur and the tibia, she’s going to come out to complete extension. We look at the soft tissue balance. She’s not moving. Everything looks good, the overall alignment looks great. So go ahead, Jim. Now we’re going to cut the patella. And again – go ahead, Wes – we’re not going to everting the patella. We’ve got a nice little clamp. This is the Ortho Development Total Knee System, and we worked with them to help design this equipment to let us do this procedure through this small incision. And it’s an excellent system and really works out nice for us. Let’s see. 22. Set it at 12, please. So what we do is we measure the thickness of the kneecap, and that’s 22, so we want to get within 2 mm of the original thickness. This is the clamp. Okay, squeeze. Great. Okay. This allows us to make the cut without everting the patella. But right now the tension’s pretty much off of the extensor mechanism and so even if we had to everting it to handcut it, it wouldn’t be bad at this point. So, Wesley is excellent at this. I stabilize the clamp, we protect the patellar and the quadriceps tendon. Go ahead and cut. Okay, so Gladys looks at the remnant, also measures it, and gives us a rough size of what we’re going to put on here for the patellar sizing. And Cindy, remnant is about 13. And we’re at 35mm patella. And now this is the drill guide for the patella. And let me have that. This is real nice for holding the patella in place while you drill. Okay. All right. So, now, I don’t know if you can see, but here’s skin incision again. Can you see that? The length of that, I mean, it’s pretty small, okay? And we’ve done two of the three major cuts. Now, the advantage I like of this – yeah, let’s put the patella protector in there, you’re right – what I
like about this technique moreso than let’s say a quad-sparing technique is I really think that alignment of the femur, the rotational alignment is crucial. And this is going to allow us to align off the posterior condyles, which isn’t all that accurate. The most accurate alignment is going to be off the transepicondylar axis. And when we’re parallel to that, we want to make sure that we have a rectangular flexion gap. And this instrumentation is really set up nice for that. So we're going to mark out what we think is our transepicondylar axis. And can you guys see that on the camera? Are you able to see that? This purple line is a transepicondylar axis, which goes from the medial epicondyle to the lateral epicondyle. Now we're going to size the femur, because anterior-posterior sizing – when we talked about the extension gap we know we had that balanced out, but now this flexion forms another gap, or space, and we've got to make sure that fills up properly. So we're going to size our femur. Four. Looks like she's going to be – and again, now, she's going to be between sizes, and we'll talk about that here in just a little while. Looks pretty good there. She's awful close to the 3, but let’s pin that. Okay. And we'll try a 4 first. Screwed it up a little bit. What we don't want to do is make too large of a flexion gap. So I'd rather cut with a larger size on there and then just have to go back and cut the space again. So we're going to balance out our soft tissues here in flexion with these tensioning devices. And now, this is what I want you to see. Look at the – look at the surface of the tibia. Can we see that? Where's the screen? I can't see if we can see that. But here’s the surface of the tibia. And when I look at this, it’s parallel to the transepicondylar axis. Now, these posts were put in neutral in respect to the angle off the posterior condyle. And when we put the cutting device on, we’re going to rotate it, and you'll see that it needs to be externally rotated to match that. Okay, so – you got a ruler? That looks pretty good. And I can look through the holes on this cutting device and I can see the transepicondylar axis. So, I've got – my alignment checks, I'm 5 degrees of external rotation off the posterior condyles, and I want that to be between usually 2 and 6 degrees. There's a lot of systems that just measure off the posterior condyle, and when we first started doing these and we were using the computer navigation and we had 3-D fluoro, we actually would measure off of fluoroscopy the transepicondylar axis, and it often was not 3 degrees. It would be 4 degrees, 5 degrees. So at 5 degrees we look good, we've got a nice flexion space here, so the only thing is about the size. So we're going to go ahead now and pin this.

00:23:38 JAMES BLAIR, MD: Dr. Reilly, let me break in real quick. There was a question that related to what you were just talking about. The question is from apparently an orthopedist: “How does this approach an implant compared to the computer-assisted MIS systems?”

00:23:55 WILLIAM G. REILLY, MD: Well, we – you know, that’s a more exotic approach. We navigated – we had one of the first Medtronic systems, and we navigated about 30 knees. And you know, I never really was comfortable about that transepicondylar axis in the readings. I’m sure there’s people that can do it accurately, but you know, I like to see this space. And if you do – if you do a quad-sparing technique, you can’t see what we’re seeing. We have three checks here. So to me, you know – and we’re getting our patients out, we’re walking them the day of surgery. We’re doing this lady tonight, so she won’t walk, but if we were doing it in the morning, she’d be walking this afternoon and ready to go home on the second or third day. And we want to look at long-term results. And so we’re getting people up and moving, and I’m not doing anything different than using a large, standard approach. And I’m comfortable with this, and it’s just what you’re comfortable with. But this is something, you know, the guy that does 20, 30 knees a year can do. And again, I’m cutting a larger size here, and what I’m going to do is measure this posterior condyle here just to get an idea of how thick it is. And that looks good. That’s 8 mm. We’re going to take that. Now, I also want you to look a this. This block – this is a modification of the block designed by Dr. Colton, and this block is sort of unique for Ortho Development in that we can loosen these two screws. And if I was between sizes – the size difference is 4 mm in the flexion
So if I’m between sizes, I can loosen this and move this up 1 or 2 mm. I’ll have a little bit more of anterior displacement, but I can adjust that flexion gap. And the other nice thing about Ortho Development is that we’ve got 1-mm increments on our tibial inserts. So we can really tighten that flexion gap and extension gap up really nice with this system. That’s what I really like about it. So, okay, we’re going to go ahead with this. We’re going to make our anterior cut. All right. And again, you know, a lot of people, you know, for the potential patients out there, people, you know, always say, “Well, are you going to replace my whole knee?” We’re not. We’re just really resurfacing it. We take off small pieces of bone and we replace what we take off. Let me have the saw back. There’s just a little rise here. And it doesn’t hurt to check, check, and recheck. Okay, great. So that looks good. Let’s pull this off. Okay. Now, what I want you to look at are these cuts. And I want you to see there’s where I drew the transepicondylar axis, and I drew that before I made the cuts. And I want you to pay attention to the anterior and posterior cuts. They’re perfectly parallel to the transepicondylar axis. So we ought to be on our rotation. We’re parallel to the transepicondylar axis, we have a nice, rectangular flexion gap, so I’m happy with that. Now, the rest of the knee cuts are finishing cuts. We’re going to go ahead. This is a 4, and the nice thing about this system is I can put this cutting guide exactly where I want the prosthesis to sit because it’s the same size, particularly up on top, as my prosthesis. So we don’t have an overhang issue, and a lot of people talk about an overhang problem, particularly in females. We don’t usually get that. And you know, I’ve got this right where I want it in a line. Notch looks good. Pin it, Wes. Okay. You know, there’s a whole bunch of systems out there and a whole bunch of techniques, and you’ve just got to do what you’re comfortable with and try to do what’s best for your patients. You know, the nice thing about this is, you know, and that’s how I started 4 or 5 years ago doing this was making my standard approach smaller and smaller and my incision smaller and smaller in the quadriceps tendon until we got to this point. And the important thing is, I mean, again, perioperative pain management. You know, you’ve got to have — you’ve got to have that. That’s an integral part of this process. We’re cutting the knot. And that’s — we’re going to substitute the posterior cruciate with a post-[indecipherable]. Okay, great. All right. We’ll do our chamfer cuts now. And this block has some grooves there so that you can cut out to the side to accommodate for…all right. Now, essentially we’ve done pretty much all the cuts of the knee. And what time did we make skin — yeah, but what time did we make skin? Who recorded that? Five? So we’ve been 25 minutes into the case and talking and blabbing, and we’re getting close to cement here. But now, here’s an important part of the case — Yeah, I’ll take that, Wes. Let me have a — an alligator, please. There’s the lateral. And just a little bit of housework here, tidy up.

00:30:01

JAMES BLAIR, MD: Several questions here relating to obesity, obese patients, patients who are heavier and older, specifically, are there more problems in these people with larger BMIs, and do they require a longer recovery?

00:30:17

WILLIAM G. REILLY, MD: Well, you know, I mean, when your BMI gets over 30, it makes it a little bit more difficult, but we still do it. But you know, we have that terrible Texas triad out here: we have obesity, diabetes, and hypertension, or coronary artery disease. And the big problem there is, you know, orthopedically you may be ready to go home in two to three days but medically you’re not. So that’s what affects it there. Now, I want you to look at this. Some people don’t do this, and what I like to do is go in and knock off a little bit of this posterior condyle. She doesn’t have a lot of osteophytic buildup back here, but we want to clean this space out so that we can get good flexion. She’s got a good system there. All right. Come over on this side. Okay. Come over on this side. And I don’t know if you’ve been paying attention or not, but this team is unbelievable. I mean, stuff happens before I’m ready to do it. They’re phenomenal. So what do we have in there, we have the four? So let’s see a four. Okay. Now, this is part of our perioperative pain protocol. We’re going to
inject the knee with Marcaine and Duramorph. We use a combined mixture of 70 cc's of Marcaine, 10 mg of Duramorph. On hips, you know, hips aren't as painful as knees. On hips, I also inject with steroid. I'm a little bit leery to do that on a knee because I -- you know, I'm worried about infection in the knee, although our infection rate is -- really been excellent. We've done over 400 of these, and knock on wood, we've had only one infection. But unfortunately to that person that's infected, she's one out of one. But -- so this really helps. And this really carries him through the first day, starts wearing -- or through the day of surgery. Now, we're going to put our trial components in. This is our femur. We're in there. All right. Fits like a glove. I like posterior slots on my cutting blocks because that allows me to -- We get this in there, all right. So there we go. Let's see an alignment rod, please. All right. Now, I don't know if you can see this, but, you know, here's our alignment inflexion, straight up and down. We're going right down the crest of the tibia. Looks good. And this is the hardest part of the case here. Wes, take that off of there, please. And we're going to be working on that because this -- this takes five minutes to get that off there. It shouldn't be -- Okay. All right, now I want you -- I don't know if you can see this. Can you see the knee? But it's balanced. You know, we don't have any liftoff, everything looks fine. We come to complete extension, okay. Good stability, medial, lateral. Now, she had some lateral tilt -- lateral subluxation to the patella. We don't have this tibia yet in the final position, but her patella's riding right in there. I don't know if you can see that. So we've realigned her knee and we've taken care of the alignment -- the mal-alignment problem God gave her. So we're going to go ahead now and -- let's go over -- let me mark this here. I'll mark the rotation on the tibia. We'll check the sizing. Jimmy, you can go ahead and open the four femur, please. Patella's already open, correct? We're just marking a rough position of this. Okay. Let's have the... All right. Let's have the femoral remover, please. Okay. All right. So we got a little bit of tidy work to do here before we cement this. Okay. Let's have the bone block. I like to put this bone block in here to protect things so I don't crush it. PCL retractor, great. Super. Do we have the patellar protector, please? We use this patellar protector particularly -- you've got to be careful on older people; if you pull too hard, and you don't want to break that patella. So -- so this keeps us from crushing the bony surface, and this is always hard part for me to get in here. Can't see the dang thing. Okay, there we go. Good. Okay. All right, okay. Over here. A little bit of housework here, please. Let me have forceps. Let me have the wide one, please. Thank you. Okay, great, all right. And let's have forceps, hot knife. We'll do a little bit of cleanup some of this soft tissue laterally. Again, this is the hardest part of the knee for using this exposure is cleaning up this lateral tibia. And we got it. All right. And let's see the four. Ooh, fits good. Okay. All right. Jimmy, open the four. Gladys, mix. Now, while we're going ahead -- we've got everything in here now. We're preparing the tibia for the final component insertion with the punch. While we're doing this -- and they'll keep showing this as we go ahead and cement the final components in. By the way, it's -- we're ready to cement here. What's the tourniquet time? Thirty-nine -- thirty-one minutes. So 31 minutes into the case, we're cementing. So, you know, this is a procedure that can also be done quickly and efficiently. Dr. Blair is going to talk to you now. I'm going to go offline. You'll be able to watch us, but Dr. Blair's going to talk to you about our perioperative pain protocol here, which he's really worked hard on. And again, is as important as this technique. So, Jim, why don't you go ahead, and we'll get ready to cement here.

JAMES BLAIR, MD: All right. A component of this process that really we have worked over the past four years to effectively massage, create, change, and make as useful to all of our patients as we possibly can is reducing the pain associated with total joint surgery, both total hips and the total knee procedure you're watching today. Improving this experience involves several things. It's really been an evolutionary process. Understanding that pain results from neurochemical activity at many sites in the body and at multiple receptors, including the surgical site, the spinal cord, and the brain. Treating as many of these sites as
possible with low doses of multiple medications results in a substantial reduction and even elimination in the need for narcotics and increased patient satisfaction as a result. Why do we do this? Well, as Dr. Reilly has described, it improves our outcome. We get people into the hospital, through the procedure, and out of the hospital quickly and efficiently. People are more rapidly mobilized, patients are up and moving more quickly, they're moving with less joint discomfort, and their overall recovery time is substantially shortened. The hospital stay itself is reduced. We commonly get these people out of the hospital in less than three days. Our average for patients who do not have profound medical problems is about 2.3 days. The patients themselves are very much more satisfied with this process, and there is overall decreased morbidity in the process. How do we do this? Well, it's a matter of taking this group of medications and the techniques of regional anesthesia and employing them together. We start with pain management preoperatively; we give patients medications a day or two ahead of time, and we also add medications immediately preop. We use more regional anesthesia. We started these procedures originally with epidurals; we found that managing those on the floor was more work than we had staff for, and so we've gone to spinal anesthesia. We've also decreased the dose and use of narcotics overall, although for total knees, we still use a PCA. We have increased use of non-steroidals, and we still use Celebrex in our procedures. We've increased the use of other pain adjuvants; there are several different types of receptor adjuvants that we apply both orally, intrathecally, and through the use of sedation. And we've also gone to the trouble to try and prophylaxis for side effects. Basically, people don't want to come to the hospital and feel like they've gotten a dose of the flu, and that's what happens with a lot of narcotics quite commonly, and that's also what happens with the perioperative process. Nausea is one of the things that goes along with it, and we try as hard as we can to prevent or at least ameliorate that. I'd be happy to take any questions that you'd like. Dr. Reilly, there are a couple of questions here that you might field while you're gluing up.

00:39:35
WILLIAM G. REILLY, MD: Okay. Is my mike back on?

00:39:37
JAMES BLAIR, MD: I think so.

00:39:38
WILLIAM G. REILLY, MD: Okay. I'll stop singing my Jimmy Buffett song, then.

00:39:44
JAMES BLAIR, MD: There's a question here about gender-specific prosthetics. As I think you mentioned, you don't necessarily have to employ gender-specifics, but have you used them or would you use them?

00:40:01
WILLIAM G. REILLY, MD: Well, you know, I haven't used them. I'm aware of them, that they are made and available. And I think there are some good points to them, but, you know, you become comfortable with your own prosthesis, and I'm sure that's a good prosthesis, and all the points are well-taken, but I just really haven't seen -- in terms of sizing -- that much problem using this system. And I don't know if that's a difference in the basic height/width ratios of this component compared to the manufacturer that made the joint-specific component, so -- but, you know, I mean, that's an advance, supposedly, and -- you know, there's people that are comfortable with that, and they had some really good guys designing that knee, and I'm sure in their hands, you know, it's great. You know, orthopedics is still a -- you know, thank God -- you know, a debate issue in a lot of things, you know, and most orthopedic surgeons are of the philosophy there's three ways to do things, right: the right way, the wrong way, and my way. So my way is with the Ortho Development system, and it works fine for me.

00:41:19
JAMES BLAIR, MD: There's a question about the life expectancy of this prosthesis. What is the life expectancy? Should younger patients receive this procedure -- receiving this procedure expect to endure another replacement in their later years?

WILLIAM G. REILLY, MD: Well, certainly, you know, the younger it goes in -- now, you know, the length of this is going to be related to activity. If you put this in a young person, and we did a basketball coach eight years ago and told him, you know, "You can't do impact type things." And my son played basketball for him last year, and you know, he's doing great, and he's running up and down the basketball court. So, you know, longevity can be related to a lot of issues. But, you know, most results are -- you know, you could expect 90% of these to last 15 years. And if -- these are modular systems, and if you watch this, and watch the polyethylene wear and you're not getting a lot of osteolysis, you know, you can go in and exchange the plastic, and we've done that. And we've been successful with that. And I mean, you know, that's subjective. Again, you know, we're a little, community place. We do only about 300 joints a year, and you know, I don't have time to, you know, have somebody doing research, and so, you know, that's all subjective. But -- but, you know, I think all the papers will demonstrate that most systems, you can expect 90% to go 15 years.

JAMES BLAIR, MD: Here's a question here that's, I presume, from an orthopedist that said: do you perform bilateral TKAs or do you just -- or do you restrict this to one knee at a time if both need replacing?

WILLIAM G. REILLY, MD: I -- I use a cutoff age -- physiologic cutoff age of 65 -- for bilateral total knee replacement. And yes, we can do this in bilaterals. But in older people, I don't encourage it. Let me have the punch. We've made a plug here -- now, I don't know if you can see that, but -- I need a punch. We're going to go ahead here and fill the hole that we made, erase our tracks that we've been there. And that helps cut down a little bit on blood. Sorry, so we're cementing things in, okay. So did I -- I'm sorry, Jim, we were in the middle of something. Do I what now?

JAMES BLAIR, MD: It says, do you perform bilateral total-knee arthroplasties, or do you restrict it to one knee at a time if both need replacing?

WILLIAM G. REILLY, MD: I -- I use a cutoff age -- physiologic cutoff age of 65 -- for bilateral total knee replacement. And yes, we can do this in bilaterals. But in older people, I don't encourage it. Let me have the punch. We've made a plug here -- now, I don't know if you can see that, but -- I need a punch. We're going to go ahead here and fill the hole that we made, erase our tracks that we've been there. And that helps cut down a little bit on blood. Sorry, so we're cementing things in, okay. So did I -- I'm sorry, I'm in the middle of cementing -- did I answer that question okay for the person?

JAMES BLAIR, MD: I think so. I think so.

WILLIAM G. REILLY, MD: You know, and the other issue is, you know, I cement all my knees and I don't cement my hips, so...

JAMES BLAIR, MD: Question, I presume from someone who might be interested in -- in having one of these procedures: how long before you can return to work?

WILLIAM G. REILLY, MD: Well, it depends what you do. I mean, in -- you know -- in the recovery period. You know, we've had people, office workers, get back, you know, the second week. You know, if you do your right knee, I don't let you drive for four weeks. If you do your left knee, you can drive. You know, heavy duty is a different issue, you know? And, you know, I think six, twelve weeks, and again, when you get out -- heavy duty -- you know, I like you to try to avoid any impact things, lifting heavy weights. Total knees weren't made for prolonged squatting or -- but, you know, I mean, you could get back to office duty or light duty in, you know, two weeks. And you know, it's a bell-shaped curve. You have
people that go a lot longer and you have people -- you know, total joint replacement is 40% dependant on the surgical team and 60% dependant on the patient, and you know, again, this is a team effort. And you know, the family is part of the team for encouragement and -- and the motivation of the patient. And some of these patients, I mean -- you know, by golly, we had -- you know, the other day we did -- some guy was in his late 70s, and he walked the first day without a cane, you know? He was just a tough guy, you know? I don't know if he was a Marine or what, but... So everybody's different. And again, it's -- no matter how good the surgeon is and how -- you know, the patient has got a lot to do with this. Okey-dokey. So what's the time here? Forty-five. So 45 minutes, we got everything cemented in here even with me blabbing, so you know, you can do this procedure -- and again, when we get all this out, you'll see, we haven't extended this incision. We're probably a little bit less than four inches. And you know, that -- on the other side, with that unicondylar knee that she had done in Colorado, that scar is eight inches long. But again, it's not the skin incision, it's -- you know, the minimal disruption to the quadriceps tendon, whether you do a mini-quad split, you do a mini-- mid-vastus, you do a sub-vastus, or you do quad-sparing, it's the soft-tissue work that really counts. And the perioperative pain meds. So, all right, any other questions, because we got -- this is always the worst part of the case for a AAA personality, to sit here and wait for cement to harden.

00:46:33
JAMES BLAIR, MD: This -- a couple of questions here relating, I think, to sports. One question: is this a sports knee? I'm a bicycle and dirt-bike racer.

00:46:44
WILLIAM G. REILLY, MD: Well, if you're a dirt-bike racer, you know, I may see you in the E.R. Sports bike -- yeah, you know, we encourage you to ride a bike. You know, you can mountain bike, you can ride a bike, you can do watersport activities. You could play doubles tennis. You know, we like you to avoid impact things: we don't like you running a lot and jumping. But, you know, everybody's an individual, and -- and like I say, you know, that basketball coach is an example. I mean, you know, he -- he knows the restrictions, but, you know, he's willing to take the risk, so -- biking for sure, but I discourage anybody from riding motorcross. I've seen too many people like that in the E.R.

00:47:28
JAMES BLAIR, MD: Does this system you're using come in a high-flex also?

00:47:32
WILLIAM G. REILLY, MD: No, it doesn't. you know, we've done, again, probably over 400 of these Ortho Development knees, and our flexion ranges are about 115, 117 degrees.

00:47:48
JAMES BLAIR, MD: There's a question here about: what is the difference between spinal procedures? If that's referring to spinal anesthesia, basically the two types of spinal anesthesia that we can do is -- is what's called an intrathecal, where we put medicine inside the spinal canal, and the other is an epidural. This patient today is being done under a spinal anesthetic. There's a question for you: if the tibia is crooked, would it have to be aligned first before a total knee replacement was done?

00:48:17
WILLIAM G. REILLY, MD: Well, it depends, quote, "how crooked it is." And you know, very rarely, you know, you may need an osteotomy, and when we get something like that, you know, we have computer navigation. And that aids us in realigning the knee. But it depends on -- on the deformity.

00:48:40
JAMES BLAIR, MD: There's a question here that asks if the patient is awake, and I think as I -- I said a little earlier, this patient has received a spinal anesthetic and is actually under light sedation. Taking a nap, basically, while the patient is undergoing the procedure. But we could easily arouse her. I mean, she's not under a general anesthetic by any stretch of the imagination.
WILLIAM G. REILLY, MD: I like to tell my patients that Dr. Blair gives them two choices: he either sends them to the beach in Hawaii or the beach in Cancun, you know? That's so they don't have to listen to me. Sometimes when this isn't live broadcast, I have been known to sing, but that's bad on the patients. Okay, how we coming? Again, the hardest part of the case is waiting for the cement to harden.

JAMES BLAIR, MD: I presume this is from an orthopedist, it says: it looked like you took the PCL; do you use a posterior-stabilized knee?

WILLIAM G. REILLY, MD: Yes. This has a post and a cam, and I routinely take the posterior cruciate ligament. And that's why -- you know, I took the extra 2 mm off of my extension gap -- I cut 11 mm, and the prosthesis is 9, and that's to accommodate -- when you take the PCL, you open that flexion gap up one and a half to two millimeters more than the extension gap, so you want to take just a tad more off of that femur to accommodate for that. Both -- both cruciate-retaining and cruciate-sacrificing knees are great. I mean, again, it's in the hands of the surgeon what he's comfortable with; I just feel -- you know, I didn't feel comfortable with a lot of complex knees balancing out that PCL. Let's see a nine, please. now, what we're going to do is, we have an eight in, it comes to complete extension. We're going to put -- and again, the nice thing about the Ortho Development: one millimeter inserts. You know, and it's really nice. It makes it a lot nicer that way because we can tighten things up just about the right amount. All right, so there's nine. You can see the knee, all right? Good position of the condyles, I can't get my fingers in there, there's no liftoff, good flexion, good stability. And we're still straight, even at nine. All right, let me see a 10 because that's what we cut for. And let's make sure we don't have any cement back there, clean her up a little bit there. Looks good. Let's see a 10. all right. And here's a 10 mm insert, and that's what we cut for. Let's get that in there. There we go, okay. There we go, good. Okay. And that knee's straight out, good stability and flexion, good stability throughout the range, patella tracks nicely. That's it. It's closure time.

JAMES BLAIR, MD: Dr. Reilly, they've heard it a few times, but there's a questioner who wants to know what the name of the product -- the prosthesis that you're using -- is.

WILLIAM G. REILLY, MD: This is the Ortho Development Balanced Knee System. Ortho Development is in Salt Lake City, Utah. Excellent company; they'll be there at the academy, so... Okay.

JAMES BLAIR, MD: Yeah, there's a few. Dr. Reilly, does this procedure ultimately help people who have hyperextension problems with their knees?

WILLIAM G. REILLY, MD: Ultimately help -- well, you have to, you know, cure the hyperextension problem. Oh. With that glare, I can't see the spot. Down, down. With the -- and again, here's the knee straight out. Can you see that? I don't know if you can shoot it from the side. Can you shoot that from the side? Okay. Straight out, good stability throughout, patella's tracking nicely. That's it. It's closure time. Okay, now we're going to irrigate and then we're going to -- we're going to inject the soft tissues now with the Marcaine and the Duramorph, and where are we at -- where are we at in terms of TV time?

JAMES BLAIR, MD: We got about another six minutes.

WILLIAM G. REILLY, MD: Another six minutes, all right.
JAMES BLAIR, MD: There's a couple more questions: what is the probability of infection in a new knee and what are the preventive measures? Also, what are the complications ranging from least to greatest?

WILLIAM G. REILLY, MD: Well, in terms of infection, you know, no matter how careful we are, the bugs win. And you know, the infection rate can be, nationally, between 1 and 2%. And you can see -- I mean, we're wearing space suits, vented suits, we give perioperative antibiotics. But, you know, the bugs win sometimes. So like I say, but we've done 400 of these -- over 400 now -- and we've had one infection. And you know, I'm knocking on wood because, you know, I mean, no matter how careful you are, no matter what institution you're at, you're going to -- the bugs are going beat you sometimes, so... But fortunately for us and for the patients throughout the country, you know, the infection rate isn't that bad. And I'm sorry, what was the other part?

JAMES BLAIR, MD: Other part of the question is: risks associated with this procedure ranging from least to greatest.

WILLIAM G. REILLY, MD: Well, I mean, certainly, you know, the greatest risk of any surgery is, you know, mortality, and -- and you know, that, thank God, is very, very rare. You know -- you know, I always tell my patients I'm not God. I think the biggest risk is, you know, not everybody does great, you know? I'm not God, I can't guarantee you'll get a good result, but 80-90% of the people do excellently. So, you know, you could get a blood clot, but we're going to get this patient up and moving and, you know, we give -- we give perioperative heparin, and we're put -- right now, by the way, we're putting in a reinfusion drain. We're going to give the blood back to her after four hours. You know -- you know, deep vein thrombosis, but since we've been doing this minimal incision technique, like I say, if we did her today, she'd be walking this afternoon. And the guy yesterday walked 800 feet with a cane. You know, we use foot pumps, we just give them aspirin, we get them up, we get them moving, so the incidence of DVT is -- is not that high anymore. Pulmonary embolism, you know, that's a -- that's a rarity, but that can happen. You know, we could fracture something going in here. I mean, you know, there's a lot of things that can happen, you know? You can get killed by an elephant that falls out of an airplane walking -- while you're walking down the street, you know, and that can happen. And you have to say, "Yeah, but does it happen?" No.

WILLIAM G. REILLY, MD: Home of Friday Night Lights.

JAMES BLAIR, MD: Can valgus be corrected?

WILLIAM G. REILLY, MD: Yes. Yes. Valgus knees can prove to be some of the most difficult knees to correct. Yes, they can be corrected using the same technique. So we're going to bend the knee now and make sure we've got the appropriate position on the -- okay, that's one-hour tourniquet time, so...

JAMES BLAIR, MD: Where are you? And I can tell you that we're live from Alliance Hospital in Odessa, Texas.

WILLIAM G. REILLY, MD: Home of Friday Night Lights.

JAMES BLAIR, MD: And also if you -- and listen, if you watch the Heroes, and I'm a real hero at it, you know the major headquarters for finding the aliens is here in Odessa.
JAMES BLAIR, MD: Right. Right next to the mountains.

WILLIAM G. REILLY, MD: But don't believe the mountains in the background. Okay.

JAMES BLAIR, MD: Is this -- is this operation available in the U.K. What does it cost in the United States?

WILLIAM G. REILLY, MD: Oh, well, you know, cost -- I can't -- hold on just one sec here -- all right, what I want you guys to see is, I want -- show this incision again. Let me have a ruler. And, you know, we haven't extended this. And here's the ruler, there's the incision, and it's less than four inches. Can you see that? Okay. You guys want to go ahead and close? Okay, great. Casey and Wes are a lot better at sewing than I am. You know -- what -- the question, the cost? I don't know what the cost of the procedure is here or in the U.K.

JAMES BLAIR, MD: Do you use highly crosslinked poly in your tibia?

WILLIAM G. REILLY, MD: In this case, no. And there is -- I'm sorry. There is -- you know, there's some debate as to whether you want it in a tibial component. I -- I expect this knee to go, you know, 15 years. And again, you know, it depends on the alignment. That's why we use a minimal incision technique, so I can see the flexion space like you saw. I can make sure my femur's properly oriented. And you know, we know the long-term results using standard alignment, and basically that's what we're doing with just shrunken instrumentation, so... You know, I can't tell you that they're going to go 15 years because we've only got some about three, four years out now.

JAMES BLAIR, MD: There's a 53-year-old male who's looking for a double total knee replacement in the near future. He's very young and concerned about failure and how long the TKR lasts. I think you addressed this earlier, but perhaps you'd like to talk about replacing the component again, as you mentioned earlier.

WILLIAM G. REILLY, MD: Well, you know, I mean, it's -- it depends on your activity level, you know. You know, it depends on your body mass index and how active you are. And you know, if you take care of them, you can expect over 90% of them to go 15 years or longer, and you know, if you watch that plastic and keep your eyes on it, you can go -- replace that and you may get more.

JAMES BLAIR, MD: Dr. Reilly, perhaps you'd like to kind of briefly go over the process immediately postoperatively. How do we -- how do we take care of these people postop?

WILLIAM G. REILLY, MD: All right, postoperatively, they go -- they'll go in a CPM machine immediately when they get to the floor. Again, if we had done her in the morning like we usually do, she would walk that afternoon, starting out on a walker and we'd progress her to a cane as quick as possible. You know, 80% of our people that are physiologically less than 65 are on a cane by their third day and off their cane by the second or third week. Older people may go, you know, three, four days, you know, before they're on a cane. And, you know, we talked about activity limitations, but, you know, 80% of our patients go home. I just don't like people going to rehab hospital. You're on a cane, you can get around, if you got a good, supportive family, you go home and you do outpatient PT. There -- you know, the only people that go to rehab anymore are people that are really sick with multiple medical problems or, you know, live way out somewhere in the valley and don't have access to therapy or anybody to take care of them.
JAMES BLAIR, MD: What do we do for prophylaxis of deep venous problems?
WILLIAM G. REILLY, MD: We get people moving. We use a regional anesthesia and we just -- we give a little dose of heparin before the case, we get them up, we keep them on aspirin, foot pumps. But we get them moving. We get them moving. We don't keep them in bed like we used to in the old days.
JAMES BLAIR, MD: Dr. Reilly, I'd like to thank you for your presentation and for the surgical procedure we've just witnessed. I'm Dr. Jim Blair. This is a completion of a total minimal-incision knee procedure from Alliance Hospital in Odessa, Texas. Thank you.
ANNOUNCER: This has been a minimal incision total knee replacement performed from Alliance Hospital in Odessa, Texas. To obtain more information, to make an appointment, or make a referral, please click the appropriate buttons on your screen.