TOTAL KNEE REVISION SURGERY
California Hospital Medical Center
Los Angeles, CA
October 25, 2006

ANNOUNCER: You're about to see a webcast of the Vanguard SSK Revision Knee System live from California Hospital Medical Center in Los Angeles, California.

EDWARD J. McPHERSON, MD: Patients that may require revision total knee usually present with either swelling, pain, or instability of the knee; the knee is swollen, the knee hurts, when you walk, it hurts, and you have pain at night. The physician then must assess whether this is an issue of instability, whether this is osteolysis, or whether this is infection. And that's the specialist's job, to make sure we know what's going on before surgery.

ANNOUNCER: Using Biomet's Vanguard SSK Revision Knee System, surgeons are able to address the complex bone defects that revision cases often present, and are able to customize the implant to accommodate the needs of an individual patient. At any time throughout this webcast, e-mail your questions directly to the surgeons by clicking the MDirectAccess button on the screen.

JOHN LAKE, MD: Good afternoon. My name's Dr. John Lake, I'm an orthopedic surgeon. I'm from just a bit south of here, La Mesa, CA, and here is Los Angeles, CA. We're in downtown Los Angeles. We're at the California Hospital Medical Center, and we're here to learn how to revise a failed knee arthroplasty. We're going to use the Biomet Vanguard Knee Revision System, and our host today is Dr. Edward McPherson. We're at the California Hospital Medical Center. Dr. McPherson is the director of orthopedic surgery of the Los Angeles Orthopedic Institute, and he is in the operating room. We're in operating room seven. He is going to introduce his staff right now and tell us a bit about the situation that we're in, and we'll go to work. Ed.

EDWARD J. McPHERSON, MD: Good evening, ladies and gentlemen. John, thank you very much for coming up. I know that you have a very busy practice down there in San Diego, and again, thank you for coming up. I'd like to welcome you all to California Medical Center. I'd like to introduce you to our team here. I'm primarily involved in primary and revision hip and knee-replacement surgery. We do approximately 500 cases a year here. I would say about 16-18% of our cases here are revision total knees, and about 20% are revision hips, so we -- we get a lot of practice with this. We have a patient here today who is unhappy with her knee. She's 72 years old. She has a stiff knee, John, and I'll show you here just briefly. She tends about 10% and only bends to 45%, so this is an issue with balance of the knee. A lot of reasons go into why a knee malfunctions; the most common reason is for osteolysis and wear, which usually you see after 10-13 years. A knee that has to be revised early is either due to infection or instability or stiffness, and in this particular case, our patient is stiff. We need to restore her function. She's not happy...
with how she's doing. I've ruled out infection, I've aspirated her knee, I have done serial blood tests; all are normal. So we're ready to proceed with a revision knee for her. I want to introduce to you our staff today. I have our nurse anesthetist, John Vorbluski, up top. I want him to talk to you later in the broadcast for what we use for postoperative pain management; we use some novel techniques using a femoral nerve block which I learned from John Cuckler at University of Alabama. We also use a spinal or hypotensive technique. I want to introduce to you Dr. Carlos Vasquez, my physician assistant here, who is assisting me. I've got Andre Archer up here, up top. I got Stephanie Stebbins, who has been with me for years; she knows the systems inside-out and actually knows it better than I do. I have Frances Golongue, and I've got Marcus Calderon and Carleena Brown on the back, so this is our whole team today, so I think we'll get started. We have a tourniquet already up, we've already given her a perioperative antibiotics. The main issue, as you know, with a revision knee is going to be exposure with a stiff knee, and that's what we're going to get to. I didn't want to do this before the broadcast because it's always difficult to get exposure, so we'll start through the skin and subcutaneous tissues, find the flaps, develop them, and find our extensor mechanism, and that'll be our starting point. I try not to put a lot of retractors on the skin. We have a Bovie cautery here to help find our tissue plains. I tend to use my hand on the skin so we don't traumatize it too much. So here I'm going to find the -- the vastus medialis on this side, and that brings me the margin here so we can find this medial skin flap. She's a short girl. She's 5 foot, she weighs 152 pounds. Her BMI is 31, so that makes our exposure a little bit more difficult. Absence, real quick. We're right around the patella here now, John. I hope the light's okay for you.

00:05:52
JOHN LAKE, MD: Actually, it's very good.

00:05:54
EDWARD J. McPHERSON, MD: Yeah, I try to turn down the intensity.

00:05:56
JOHN LAKE, MD: And I'm seeing as well as you're seeing. I'll tell our viewers that I'm outside of operating room seven right now, and I think that's fine rather than being in the operating room because it cuts down on the traffic in the operating room, and we don't want a lot of traffic and unnecessary people tracking around an operating room. I see you're in a hooded clean suit, and we use that, too, and I think that really is one of the important things for preventing infection.

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EDWARD J. McPHERSON, MD: I really believe strongly in that. As I was looking at my numbers before the broadcast, 16% of my revisions -- or 17% of my cases last year were revision knees. Half of those, by the way, were infection, so I think I did about 29 revisions of the knee for infection, which is a two-stage, so we took them out, cured the infection, and then put them back in. So we're really big on cutting down bacterial load. So what I've got is I've got the skin flaps open; we've made a long incision, and the reason for that is we don't want to tear the tissues and traumatize it, and I'm not worried about making long incisions if it saves the healing capability. So here's our patella -- Andre, if you just hold that there. You can see it's very stiff. The patellar tendon is right here, and we'll just get this flap up just a little bit.

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JOHN LAKE, MD: Now, there's going to be a lot of interest in this system that you're going to use and I think that, as far as orthopedic surgeons go, we're always interested in equipment and things like that, but right now this may be the most important part of the operation because the soft-tissue exposure and how you get in there is the challenge, and how you get in there without breaking something is the challenge. And this knee is going to be a real challenge because it just doesn't move,
and of course, that's why we're here. Do you have -- do you have any thoughts -- I mean, here's a situation where a woman has only been two years after a surgery, and this knee just isn't moving. Any thoughts why that might be the case?

EDWARD J. McPHERSON, MD: Typical scenario with that is mismatch; the -- a knee bends because the tissues follow it, and if you fill up the space too tight with the parts, then the tissues have no place to move, and I believe that's what's happened in this case. I think when the patient doesn't move, you can't blame the patient for not doing the rehab; you've got to be able to give them some room and freedom to move those tissues around. And in this case, you can see, here's the kneecap, here's the knee; the tissues are just enveloping the entire knee, and this happens when there's no motion in here. So the spaces are open when there's motion occurring, and in this case, she really didn't get off to a good start at all and it just filled up. She had one manipulation, and it didn't help her. Hold that right here.

JOHN LAKE, MD: It just filled up with scar tissue, didn't it?

EDWARD J. McPHERSON, MD: Yes. The whole thing's filled up with scar tissue, and what I've got to do is -- what I'm going to do is a tibial peel technique. I'm going to lift up this tissue right off the tibia and literally peel this tibia out rather than do any cutting of bone to get my exposure, so this is going to be the hardest part, as you said, is getting this exposure. And I like to do this without a cautery just because that skin edge, or that tissue edge, can get damaged with the cautery, so I just like to do it with an osteotome.

JOHN LAKE, MD: Now, you're going medial with that. How about -- how about lateral? What are you going to do with the tibial tubercle? Are you going to leave that in place or consider an osteotomy?

EDWARD J. McPHERSON, MD: I'm going to leave it. What I'm going to do is I'm going to leave it, and what I'm going to do is I'm going to peel the tibia out, that'll allow me exposure for the patella, and then I'll debride the patella, and you'll see, once you get the tissue -- scar tissue off the patella tendon, that'll give you much better access, so the one thing I'm doing right off the bat, I'm doing a big exposure of the tibia, which means, yes, I am releasing ligaments, and yes, that makes it loose, but that's why I have the SSK system. It's a wonderful system because it's superstabilized, so if I release all these ligaments, I can stabilize the knee with the implants and allow the ligaments to heal after that.

JOHN LAKE, MD: Well, we all know from football injuries that the medial collateral ligament heals, and we know from knee replacements like this that it can heal, so... Now, you're not -- you went up along the quadriceps tendon and the vastus medialis insertion. Is that -- is that your usual way to go?

EDWARD J. McPHERSON, MD: Yes. This -- this is tibial tubercle. I'll come right around the patella. I came over the top of the patella just a little bit, and you can come over the top or around, and what I'm going to do here is first focus on the medial side. I think I'll bring it back in extension and allow some of this to be exposed. Towel clip. And again, we're spending a lot of time just to get this knee exposed. Another towel clip. Thank you.

JOHN LAKE, MD: Well, like we said, a lot of time here is important. This is probably the most important part of the operation.
EDWARD J. McPHERSON, MD: And I'll just hold this back so you can all see. So my next step here is to open up this medial gutter, and we'll -- got the Bovie cautery here just on -- just adhesions.

JOHN LAKE, MD: Are you going to evert the patella or simply slide it off to one side?

EDWARD J. McPHERSON, MD: I'm going to try to let it slide to the side, but really, what I want to do is make sure that all of that scar tissue is removed. So I'm coming around here -- remember, the epicondyle's here, so you don't want to go below the epicondyle and really cut ligament off if you don't have to.

JOHN LAKE, MD: I've got a question that came in about a hinge knee, and you know, I think one of the important things to understand about knee arthroplasty is that a lot of people have the concept that we're putting a black box in a knee that has a -- has a hinge in it, and what we're really doing is properly called the resurfacing arthroplasty; we're putting on a new tread. We're putting a -- we're putting on -- we're putting on a tread on the bottom of the femur, we're putting on a tread on the top of the tibia. So here's a question that says, "Are you seeing your need for a hinge knee decreasing with this type of implant?" Well, I don't think many of us do hinge knees. What's your experience with hinge knees?

EDWARD J. McPHERSON, MD: My -- I'm probably the oddball of the group on the West Coast here. Hold that, Steph. I've -- I've got about, believe it or not, John, with my infection group, about 142 hinges under my belt over the last five years only because when I'm going for infections, other people amputating leg, I'm going for (inaudible) and using endoprosthetic replacement, so I'm replacing segments -- whole segments of bone, and when I do that, there's no collateral ligaments left, and -- and there's no condyles left, so those are more what we call -- not revisions, but salvages after major infection.

JOHN LAKE, MD: So this correction this question is addressed to that, I think, and -- and the questioner is asking, does this get you away from some of those hinge knees, the fact that we're going to use this superstabilized system?

EDWARD J. McPHERSON, MD: Yes. Correct. So I'm going to start rotating this out right here, and I hope you guys are all seeing okay. Again, I'm still having trouble getting in, but this is why I chose this case is so you can -- if it was an easy revision, it would be really boring for everybody. So I'm going to keep rotating around the corner here, keep rotating around the corner. Again, this is part of the pes anserine complex here, I'm going to keep rotating. I'm going to keep it rotating out. And see how I'm delivering this out, and that allows me more exposure underneath. The more I get out, the more I can go. Hold that right there. Good.

JOHN LAKE, MD: Well, I must say, you're seeing quite around the corner there.

EDWARD J. McPHERSON, MD: It's what we call "around the world" approach here. I much prefer this to a tibial tubercle osteotomy. Rongeur. I've tried those, and they don't heal very well. What's your experience with those, John?

JOHN LAKE, MD: Oh, I do them, but I -- I do an awful long one so that there's a long area for it to heal to, and I've done all right with them.
EDWARD J. McPHERSON, MD: They're tedious, I will tell you that. Now, this is where I have to be careful; I have to rotate this out because if I stress this too much, it's going to break this patella and it's going to be a longer day than what I have planned.

JOHN LAKE, MD: Looks like you're already at about 90 degrees of flexion or so.

EDWARD J. McPHERSON, MD: Yeah, not bad. I'm getting there.

JOHN LAKE, MD: Do you have a lot of tightness up superior there?

EDWARD J. McPHERSON, MD: Yes, I do, actually. I've got a lot there. I'm about 90, so I'm going to go around to the corner just a little bit more, and then I'm going to come back to here. That allows a little bit more exposure of the patella, and again, I'm going to go right down to the tibial tubercle and try not to rip this at all, just let that slide up. Now I'm getting to the patella tissue, and Andre will get a pick-up, and again, I'm taking just scar tissue. I'm not taking tendon, just scar tissue right here.

JOHN LAKE, MD: Now, you're probably going to leave that patellar component in place, aren't you?

EDWARD J. McPHERSON, MD: Yeah, I like it. I mean, the reason we're here is to get a knee that bends. If it was loose, I would take it out, but I'm going to leave it if I can. The patella, I'll measure it. It's not too thick. I've been measuring my kneecaps here on my primaries, and on the West Coast, the kneecaps have been measuring around 22 millimeters average thickness, so this one, I can feel it right now, is probably under that right now, so I don't think it's too -- too thick. You can overstuff a patella. I've done that.

JOHN LAKE, MD: Sure, but we don't want to make it too thin, so you probably want to leave it just --

EDWARD J. McPHERSON, MD: Absolutely, I agree with that 100%.

JOHN LAKE, MD: Now, the gutter is the area off to the side of the femur right under your hand right now, that would be the lateral side.

EDWARD J. McPHERSON, MD: I'm trying -- that's the hardest part; in some it's a little stocky, and this is the most frustrating part. A lot of people will try to force it, and this is where you can tear tendons. The most common --

JOHN LAKE, MD: And that's all just scar tissue that you're cutting out of there, isn't it?

EDWARD J. McPHERSON, MD: Yeah, this is all scar. Just all scar. And we'll clean it up, too, when we get up there. And again, this is scar tissue here. We'll get this out right here.

JOHN LAKE, MD: Right, because you ought to be able to slide your finger down lateral to the patella there.

EDWARD J. McPHERSON, MD: Yes. So that allows a little bit of motion. Let's see -- we can get -- now we've got -- you see how -- look at this move right here. The
knee -- the tibia is rotated out. That gives me some access, not a lot, and now what I'll do is, right above the epicondyle, I'll release all this scar tissue, and look what that does; that gives me all that exposure. So I peel out, and then I take all this out above the epicondyle, and I'm in better shape than where I was. Rongeur, and let's just pull this up so we can see where we are. Rongeur? And we'll lift that up.

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JOHN LAKE, MD: That's important, to get all that scar tissue out, isn't it?

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EDWARD J. McPHERSON, MD: It is. And you got to -- I still have a lot of tension on this kneecap. I'm still feeling it myself; if I have hooks and retractors levering, I still can break things, so again, I've got the epicondyle here, so I'm good. I just got to get a little bit of scar tissue here, so what I'm going to do is flex this up just even a little bit more. Now the next move is going right behind the knee. I'm going to go right here, and this is going to be -- the posterior medial corner is here, Andre's going to get this rotated. I'm going to turn it out so the tension is off there. We're still really tight, and the next move is just to remove the remnants of the PCL right here, come right around this corner, right here, and hug in. We you go straight down, (inaudible), then it's a longer day in the O.R.

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JOHN LAKE, MD: Now, this knee that was done was a posterior-cruciate-ligament knee, am I correct?

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EDWARD J. McPHERSON, MD: Correct. And that's what I'm taking out, is here posterior cruciate ligament.

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JOHN LAKE, MD: And you're finding remnants of that cruciate ligament there, aren't you?

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EDWARD J. McPHERSON, MD: Correct. I believe it was intact and may be a contributing factor to her stiffness.

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JOHN LAKE, MD: I think so. I think sometimes that posterior cruciate ligament can, if it's not done just right, can sort of jam the knee, that it doesn't flex normally, and then it gets hard to rehab. Here's a comment from somebody that said their total knee replacement was done four -- took four months to recover, longer than expected, and part of that recovery has to do with getting the knee moving so you don't get scar tissue like we're seeing Dr. McPherson cut out here. This person commented that the knee clicks when they walk, and I'll make that point that the surfaces in these things are a little bit different than the surfaces in our own knee, and they do click, and you can certainly move any knee back and forth and feel the click of the surfaces as they go back and forth, and that's quite normal.

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EDWARD J. McPHERSON, MD: My last move, John -- and I would agree, if our knee is not clicking, in my opinion, I think it's tight, so I always like to have those patients click just a little bit when they twist and pivot. There's a last move right here, posterior cruciate ligament right here, as posterior capsule. I'm going to release this all the way back to the tubular head. Notice I'm hugging in because the popliteal artery comes right about right there, so this --

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JOHN LAKE, MD: Right, you're getting awful close to tiger country back there.

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EDWARD J. McPHERSON, MD: Yeah, but, you know, this is --
JOHN LAKE, MD: As orthopedic surgeons, we were taught, all of us, to stay close to bone, and I see you're doing that.

EDWARD J. McPHERSON, MD: Now look how I'm rotating now. I'm almost to the point where I can externally rotate to the 90 degrees on the sleeve. That allows me to get access to the patella. Now I'm holding the patella. I just put the thumb on it's light, and this is all scar tissue.

JOHN LAKE, MD: Right, and that's what takes some of the -- the time after one is recovering from a total-knee arthroplasty is to -- is to keep that knee moving and to work at moving it so that this scar tissue doesn't form.

EDWARD J. McPHERSON, MD: Yes.

JOHN LAKE, MD: And you'll probably get this one moving right away, correct?

EDWARD J. McPHERSON, MD: Oh, that's why I have the femoral nerve block. That's why I want Dr. Vorbluski to talk as much as he can about our protocol because I think it's novel. And again, I didn't think of it, it's been thought up by other pain-management doctors, but he's gone to pain school, and my friend, Dr. Cuckler at Alabama, swears by it, and he says it's really helped him in his practice. He's a chairman down there. So he really thinks it has helped, and I tried it, and it really has helped my patients as well. Cuts down on the amount of narcotics. Now, one thing I have to do, I've got it rotated out, I've got it bent up, I still got to get this corner, the patella feels good to me. I'm not ripping on this tibial tubercle too much. Next thing is a bent Hohmann, and Stephanie's reminded me I have my caliper just to see -- my patella measures 19. So with that, I'm under 22, I feel comfortable it's not overstuffed, so I think we're okay here. Next move is to go back here and release right behind the patellar tendon, get some of the scar tissue out of here, and again, stay away from the posterior lateral corner where the nerve is.

JOHN LAKE, MD: Right, tell us where the nerves are. Here's somebody that's concerned about nerve damage, and I would have you point out that the knee's in flexion, so the nerves are not particularly tight, and you're quite a ways away from important nerves, aren't you?

EDWARD J. McPHERSON, MD: Yeah. If I have this -- now, the knee plane is here, I've rotated almost 90% out. Tibular head is going to be right here. The nerve is going to be right behind there, so that's the point where I can't go, so I always like to divide it -- if I got this little corner right here, this is where I stay away because the nerve is there.

JOHN LAKE, MD: And that's the perineal nerve that you're staying away from, correct?

EDWARD J. McPHERSON, MD: Absolutely.

JOHN LAKE, MD: That's the one that makes your foot go up, and if -- if you have a perineal nerve injury with knee arthroplasty, you might have to wear a bit of a brace. It doesn't happen very often. How often would you say it happens?

EDWARD J. McPHERSON, MD: It depends on the deformity. The -- the deformities that are most common are the flexion contractions with valgus, which are knock-
knees. And here, John, I'm just taking off some extra bone that either grew back or wasn't removed. So this gives me a little access. Can I have a half-inch osteotome just to get this?

JOHN LAKE, MD: Now, we -- we normally fasten components in like this with a compound that's called methyl methacrylate. For those of you that aren't used to that name, that's the same stuff that a Corian counter is made out of. It's -- it's like grout.

EDWARD J. McPHERSON, MD: And probably similar to the back of my fillings in my teeth that I have, too.

JOHN LAKE, MD: Well, I always tell people it's not a glue but it's like filling a bottle up with cement: you'd never get it out without breaking the bottle. And that's what -- what you have to do here. You have to get this out without breaking the bottle, so how are you going to do that?

EDWARD J. McPHERSON, MD: Well, that's a hard -- may I have a blue towel? I'm going to hold this -- you can see, I've skeletonized that tibia, I've got it out from underneath the femur, and now you can either chip it out or you can drill it out or punch it out. I'm going to start out with an ultrasonic tool. This is what we call the Ultra Drive, made by Biomet, developed by a friend of mine, Robert Klapper, when he was actually a resident back in New York, and this disrupts the interface. I can come underneath --

JOHN LAKE, MD: Now, that generates a little heat, that's what we're seeing, and you're cooling that off, aren't you?

EDWARD J. McPHERSON, MD: Yes, I am. If it's too hot, I know. I have my fingers on it, so if I know I'm hot, my fingers will get hot first.

JOHN LAKE, MD: And that tends to disrupt the hard cement but not the softer stuff around it, correct?

EDWARD J. McPHERSON, MD: That's right. So what I'm going to do is just disrupt everything as much as I can, and that's why it's important to have the exposure so we don't run this device anywhere out of plane. So I'm coming all the way around the corner. So what I really want to do is keep -- keep the rim of this bone intact and rest my weight of the prosthesis on this. Carlos is doing a nice job here keeping this cool for me. And coming right underneath. And if you want to, you can take a saw if you want to. I think this does it less traumatically. And I think one thing I want to do is come back this way if you'd just lever it just a little bit.

JOHN LAKE, MD: Well, fortunately, I think you can probably disrupt the cement on top of this and then that's going to pop right out. It's not like it's a closed bottle at the top, is it?

EDWARD J. McPHERSON, MD: Yeah. Sometimes these are really cemented in with good interdigitation. It takes longer to take them out. One little trick I'm going to show you is a little tap-out technique, it's called Steiman pin punch: I just drill a hole and punch it out. It's called axial disimpaction, and I think it works. And we'll see if it'll work here; we may need a little bit more of the Ultra Drive here in a little bit. She's really small-boned, and I'll tell you, she is a --
JOHN LAKE, MD: These videocasts are archived so people can watch them later on, but I just received a note telling us that there's a little over 4,000 people watching this right now, Ed.

EDWARD J. McPHERSON, MD: Oh, boy. Guess I better do a good job, huh?

JOHN LAKE, MD: Yeah, you've got to watch your step.

EDWARD J. McPHERSON, MD: Pressure's on me.

JOHN LAKE, MD: Now, you're getting underneath that, aren't you, so you can push that up.

EDWARD J. McPHERSON, MD: Yeah.

JOHN LAKE, MD: Now that's a clever idea.

EDWARD J. McPHERSON, MD: Yeah. It helps. Disimpaction -- and what Stephanie's done for me is, we've tried to figure out ways to get these out without using the big disimpactors. Let me show you what one of these look like.

JOHN LAKE, MD: Is that threaded, that pin?

EDWARD J. McPHERSON, MD: You can strap these on and pull them off, but I find that just pushing them up from the bottom seems to help, so let's just see if Andre here can tap this and break the seal.

JOHN LAKE, MD: Was that a threaded pin or a smooth?

EDWARD J. McPHERSON, MD: Smooth. Smooth Steiman pin.

JOHN LAKE, MD: Smooth. Okay, good, that's what I understand now.

EDWARD J. McPHERSON, MD: Let's just do this. Rongeur? That one went in the wrong direction. I've got to pull that back. Let's try to go up this way. You got the mallet?

JOHN LAKE, MD: That shows you how effective cement is to hold something in, that it's just pretty hard to disrupt that surface, and you have to be careful because the bone is an awful lot softer than the cement, and of course we're -- we're relying on the bone, but it looks like it just started to loosen there.

EDWARD J. McPHERSON, MD: This is the trick that I have found. If you just get around the rim, unbreak it, then you can get a Steiman pin and tap it out without having all the actual distraction devices, and notice how much we're -- got this tibia rotated out. If you did the tibial tubercle osteotomy, you would still be having to worry about exposure, so...

JOHN LAKE, MD: Oh, absolutely. You've rotated that out nicely, and the problem with the tibial tubercle osteotomy is that now you have an open are in front where it's not quite as secure.
EDWARD J. McPHERSON, MD: Right. A little extractor now. I've got a little corner here I've got to work on tapping out, and again, the magic here is finesse, not brute force. So if I can just tap it out just lightly like that, we got the cement with us, most of it, and we got the bone underneath with a little piece of metal from the Ultra Drive, and that's why I like the Ultra Drive. It helps out a lot in preserving the bone.

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JOHN LAKE, MD: Is there much cement down in the canal, or did you get most of it?

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EDWARD J. McPHERSON, MD: Not too much. I am very fortunate with that today with that. May I have a large rongeur? Our job is still not done. We've got a --

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JOHN LAKE, MD: Got some more scar tissue back there.

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EDWARD J. McPHERSON, MD: We got some more scar tissue, and also I got to get the femur off, but what I'm going to do --

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JOHN LAKE, MD: We'll come to that.

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EDWARD J. McPHERSON, MD: I'm going to make a freshening cut here because I think -- the knee is stiff, so I think we have a flexion gap mismatch. Rongeur, small. And I'm going to shave a little more tibia. If the knee is tight in extension and flexion like I think we are, we just need a little bit more flexion gap, so I'm going to downsize the femur, but I'm going to cut just a little bit of tibia only because of the fact that she had a flexion contraction coming in of 15 degrees, so I'm going to get my tibia --

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JOHN LAKE, MD: Well, you used some words there that we've got to get after, and you used the word "flexion gap," and I'd point out that when we do a arthroplasty like this, what we're trying to do is to use the ligaments that are there, and those ligaments of course have to work in flexion and extension gaps, and they have to be equally balanced, so I'm sure you're going to show us a little bit about flexion and extension gaps.

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EDWARD J. McPHERSON, MD: Right. And the other thing I want to show you right off the bat -- and this is some research I did years ago with cadavers -- proximal tibia can be offset as much as five to six millimeters, and in this pace, if I put a rod in here to hold this -- because this bone is weak -- if I'm going to put a rod down there, the rod is not centered where I want this, so that's one thing that I like about the SSK system; it has an offset tibia, but my research has shown that the offset is up high. If you put the offset down low in the canal, you're not going to achieve the goal of re-creating the position of the tibia, so I think coverage is important. So I'm going to go right off the bat and use an offset keel, which will connect the rod down below. So the first thing I'm going to do is ream this and then recut this.

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JOHN LAKE, MD: I put on the slide that shows that for our observers, and it's interesting to see that you know already that you're going to use an offset on the stem on the tibia.

00:31:17

EDWARD J. McPHERSON, MD: Right off the bat. And then I'm going to put a cutting jig on here to recut this tibia, and I'm going to show you that we're a little bit off on alignment. Not too bad, and I'm just going to make a freshening cut so we're nice and flush. You can use anywhere you want to dial this in. I'm going to make it back at zero, and this is at zero right now. And I'll use this guide as my -- use my low
point here because I know that we're a little tight and just pin this into position. And I think --
00:31:49
JOHN LAKE, MD: Now, you're going to make a cut that's exactly perpendicular to the axis of the tibia, correct?
00:31:55
EDWARD J. McPHERSON, MD: Correct, and that's based on --
00:31:57
JOHN LAKE, MD: And that's based upon the rod that goes right down the center of the tibia, correct?
00:32:02
EDWARD J. McPHERSON, MD: Correct. And that's why I'm using the rod. I like the rod. We got a pin here --
00:32:05
JOHN LAKE, MD: So this -- we call this intramedullary alignment, and this is the way that we tend to do this on a revision system. Now, why are you using a component that has a stem rather than a component that would be sort of similar to the one that you just took out that would have a -- a fairly short stem?
00:32:28
EDWARD J. McPHERSON, MD: I think that when I take these things out and hammer them out, I really think I'm damaging the bone, and I really need to have an extra support on that bone, and so -- I have always found, and Bill Bugby down in San Diego, one of your colleagues down there, has shown that if you do revision knees with primary components that don't use the revision system, then you're at risk for failure, so I'm just going to check on that.
00:33:04
JOHN LAKE, MD: Well, and of course, you want a fair amount of stability with this down the shaft of the tibia because we're going to rely here upon the constraints of the prosthesis to protect this medial collateral ligament as it heals, isn't that correct?
00:33:20
EDWARD J. McPHERSON, MD: Right. Right. So I've got my perpendicular axis. I got a slope here. I'm going to recut this and get it a little bit more flush. Hold that in right there, Andre, thank you. Thank you very, very much. And we'll just recut right here. And now we got a true flush cut.
00:33:42
JOHN LAKE, MD: Here's a questioner that wanted to know if this could introduce problems to the other leg because she's placing more weight in the contralateral leg, and my response to that would be that any time we start fixing up something like this, it's going to work better, and that makes the other leg better because sometimes, you know -- knees can come in matched pairs, and the fact that she had a problem on this side and had to have a knee arthroplasty, she might not have the best knee on the other side, so --
00:34:17
EDWARD J. McPHERSON, MD: The question, if I may interpret it, is that if this was a bad knee and stiff, she can offload onto the other knee and make the other knee worse by limping, and that's how I interpreted that question. I hope that's right. If not, your answer's correct.
00:34:29
JOHN LAKE, MD: And I think this is going to make the other knee better because it's going to help out the other knee because getting this one working right will make a huge difference.
00:34:39
EDWARD J. McPHERSON, MD: So I'm going to center this over the medial third of the tibial tubercle like this, and you can see, this is 59. That's one thing about when the designers got together with this system, we needed smaller parts for the West Coast. On the West Coast, we have a population that tends to be a little bit smaller than the Midwest Iowa farmer, so --

00:35:04

JOHN LAKE, MD: Now, what are you doing for rotational alignment there?

00:35:06

EDWARD J. McPHERSON, MD: I'm using, John, the medial third of the tibial tubercle, which is right here, and that's what I use.

00:35:12

JOHN LAKE, MD: And how many degrees off of that are you?

00:35:16

EDWARD J. McPHERSON, MD: I am on the medial third. Rongeur. So here's the middle of the tibial tubercle. I'll mark it -- marking pen.

00:35:24

JOHN LAKE, MD: So you rotate that away from that.

00:35:26

EDWARD J. McPHERSON, MD: Here's the middle of the tibial tubercle; I go a medial third. That's my rotational landmark. The rule is you don't want to internally rotate too much because that makes the tibial tubercle come over here, and that makes the tendon go out to the side, and then you -- then you may be trapped.

00:35:43

JOHN LAKE, MD: How about going down to the foot and the ankle?

00:35:46

EDWARD J. McPHERSON, MD: Yes. I -- since I am using the medullary guide, I'm not using an axle medullary guide, I just put the rod inside the canal, but when I do a primary and I don't put a rod in the canal, I'll use the rod down to the ankle. Now I want to show you this. This is -- this is the rod stem that I've chosen.

00:36:09

JOHN LAKE, MD: You can twist that into loc--

00:36:12

EDWARD J. McPHERSON, MD: Yeah, I rotate that in, and then I can rotate this offset anywhere I want. It's five millimeters of offset, and you notice it's in the top, it's not down here, so it's more versatile in terms of where I can put that position. And there's a lot of ways to do this technique, so what I like to do, what's been most helpful for me -- screwdriver -- is I just -- I just test it and see where it wants to go, and I'll take an impactor and just tap this in lightly and see where it wants to go. And that one is not bad, so that rotation, I gave it a little bit of offset right off the bat, I've rotated it right down; I'm centered, I'm over the medial third of the tibial tubercle. I actually like it, so I'll impact it one more time.

00:36:56

JOHN LAKE, MD: And so that spun into position as you went down, and now you're going to lock it and then you'll just replicate that with the final, right?

00:37:03

EDWARD J. McPHERSON, MD: Right. And so this is just one way to skin a cat. Screwdriver. But the important thing is that when you take it out, you've got to make sure that this screw is locked because if it's not locked, then you've lost your rotation, so I got to screw this really tight, and that's where I'm going to be with that, and I'm very happy with that overall alignment. Impactor. And just make sure -- - all right, it's got a good flush. I've maybe got a little gap over here, but I don't want to recut it, but boy, it was sloped over into valgus a little bit, so I'm glad I recut that; I got a better flush cut here overall. Rongeur. So the next step here is I got the
tibia covered and protected, and then I'm going to come and take this femur off, clean out the back, and then size the femur, balance the knee like you were talking about, and try to -- try to get out of here without incurring any major disruptions to the bone and to the ligament.

00:38:02
JOHN LAKE, MD: So you're going to leave that surface in there temporarily to protect the bone, aren't you?

00:38:07
EDWARD J. McPHERSON, MD: Yes.

00:38:08
JOHN LAKE, MD: That's a good idea.

00:38:09
EDWARD J. McPHERSON, MD: Yeah, so now I have my scar exposure here. All I need to do is look at the bottom down here where I can start with my Ultra Drive again. Rongeur. And disrupt this, and again, use the Steiman pin technique, which I call axial disimpaction technique, to get this out. Now -- and that, again, you can use big slap hammers, you can use saws, whatever the surgeon feels most comfortable. Again, you want to stay away from the collateral ligament here.

00:38:40
JOHN LAKE, MD: Well, I think the important thing is that you disrupt some of that cement that is in between the bone and the femoral prosthesis because if you just start slapping on that or banging on that or axially disimpacting it, as you said, without getting after that cement, you're going to take off a big piece of bone, aren't you?

00:39:01
EDWARD J. McPHERSON, MD: Yes. I've done that, John. I've done that. It's a very frustrating day when it happens. And so that's why, I guess, with wisdom, we tend to be a little bit more careful.

00:39:12
JOHN LAKE, MD: Better spend a little time now.

00:39:14
EDWARD J. McPHERSON, MD: Yeah, we're spending a lot of time getting this one going. There we go. Back here on the condyles. Remember, the popliteal artery's back here, so we don't want to go straight back, we want to go straight across if we can. And we're going to come across right here. Let me just disrupt that a little bit. Right against the post. Rongeur there. Hold this.

00:39:40
JOHN LAKE, MD: Here's somebody that wanted to know if he can snow-ski after a knee replacement, and I've got a number of patients that ski after knee replacements, and I think snow-skiing is just not much of a problem because it doesn't involve a lot of banging and pounding on the knee like jogging does.

00:39:57
EDWARD J. McPHERSON, MD: In my prof -- in my opinion, you know, life is short. And I think that implants, in terms of our technologies, are getting so much stronger in terms of the durability of the plastics. You know, the direct compression molding, the crosslinking; I think we're at a point now where I feel very comfortable letting people enjoy their lives more. And again, I'm just getting across here as much as I can and just wiggling across this bone. And Rongeur. Rongeur. And if I just get this interface all the way around, then I'm going to be in good shape. A little bit of debris here I want to get out; don't want to leave any debris behind, but again, want to be circumferential. And I'll flip over to the other side here. You guys are seeing okay, John.

00:40:53
JOHN LAKE, MD: We are seeing excellently.
EDWARD J. McPHERSON, MD: Okay.
JOHN LAKE, MD: How's your light in there? Are you -- are you up to full --
00:40:59
EDWARD J. McPHERSON, MD: We're dim. We're --
JOHN LAKE, MD: Candle power?
00:41:01
EDWARD J. McPHERSON, MD: We did a trial run about a month ago, and we wanted
the viewers to have a good experience, so we tried different intensities, and we
found that this setting right here has about 20-25% candle power, I can see good,
doesn't have a lot of glare. The grips are happy with it. You guys are happy with this
candle power? Yeah?
00:41:23
JOHN LAKE, MD: Well, we have excellent visibility, and I'm seeing just about as well
as you are.
00:41:28
EDWARD J. McPHERSON, MD: Yeah, one more bump there.
00:41:30
JOHN LAKE, MD: Now, here's someone that said, "Studies have suggested that
revision surgery for stiffness has limited success."
00:41:38
EDWARD J. McPHERSON, MD: Yes, I've heard that report, too, and I think it all has
to do with -- new blade.
00:41:45
JOHN LAKE, MD: So we were dealing here with a knee that moved from 0 to about --
gosh, I didn't see much more than 40 degrees, and the question is, how much would
your range of motion be, let's say, after all this is all done? What are -- what are you
going to predict?
00:42:04
EDWARD J. McPHERSON, MD: The answer in this case is, I know that this patient,
before her knee replacement surgery, she told me she was bending all the way back.
So if you had somebody all their life that had a normal knee and then got stiff after a
total knee, I think that those are the ones that are salvageable, meaning I can get --
restore motion. Now, if you come in with a knee that's very stiff -- I think I'm going
to do this the other way, bend this up, take this out.
00:42:31
JOHN LAKE, MD: Well, we all certainly have some patients who come in with a 90-
degree ability to flex their knee, and that's it, and you know, it's hard to get more
than that after a total knee arthroplasty.
00:42:42
EDWARD J. McPHERSON, MD: I think that is an entirely different animal, and I
agree. If you come in with a stiff knee -- I need to be over here, gentlemen. I need
to see this right here, and I'm sorry, I'm leaning my head over. Just take a little bit
off here. Rongeur. Just need to pull this this way. There we go.
00:43:00
JOHN LAKE, MD: So your prediction on this is that she's hopefully going to get back
to somewhere where she was before the index procedure, correct?
00:43:08
EDWARD J. McPHERSON, MD: Right. Now, I hope that I do a good job and that they
ask me to do a follow-up on this webcast, meaning if we get this knee in and
revived, my prediction is we get 120 degrees at six months and 120 degrees at one
year, and I would be -- love to take a video of this patient and show it to you guys at
another simulcast if the ratings are good enough and they want me back. How's that for a bet?
00:43:34
JOHN LAKE, MD: That's all right.
00:43:35
EDWARD J. McPHERSON, MD: All right.
00:43:37
JOHN LAKE, MD: Now, how long's this going to last? Here's a question that I don't think it applies just to revision surgery. This is a question that applies to the primary knee replacement. And you know, that's an interesting question, and I hear a lot of people say that, "Well, it's going to last 10 years" or "It's going to last 12 years." And my -- my comment on that is that unless it's some sort of major failure, these things will -- will have a good life expectancy that you can look at that tends to be on a straight axis on a curve, and that -- that failure rate is somewhat less than 1% a year. How do you answer that question?
00:44:19
EDWARD J. McPHERSON, MD: I -- you know, God bless Biomet and Dane Miller because Dane has always been one to design implants with a goal of increased quality of life and longevity, and he's really spent all of his years designing and working on implants and nothing more. So -- and I agree with that philosophy, and we as surgeons have got to push the envelope to try to find implants that last longer, and I think what we've done now with the direct-compression mold of polyethylenes -- M.A. Ritter has shown in his study with the early AGC results -- he's got survivals 17-19 years at 80-90%. I don't know the exact numbers because I'm a little under stress here with this case, but they're good, don't you think, John?
00:45:06
JOHN LAKE, MD: Absolutely. I -- I think it's a mistake to -- and I frequently will have patients come in, and they'll say, "Golly, I thought this would last 10 years and I'd be in having this replaced, and it's doing fine." And that's my experience. You can look at it, and when you look at thousands of patients, you might see one failing here and there, but -- but when -- the general one keeps on going and going, and especially knees, so --
00:45:36
EDWARD J. McPHERSON, MD: The other thing, too, is that these things are now modular; you pull the pin, you can do a modular bearing change, the fixation's good, so long as they don't have osteolysis, you can save these knees for another 10 years after that.
00:45:48
JOHN LAKE, MD: Exactly. So you can get into a situation like this where the primary failed because of some things that didn't work out right, but -- but I don't think there's any reason to think that this is going to fail if it's done properly, and I would say it's being done properly from what I see.
00:46:07
EDWARD J. McPHERSON, MD: So far. Yeah. The next step here, I'm going to try to get this Steiman pin in here. Again, I like the axial disimpaction, so I'm going to go right here. I don't think I incur much of a penalty when I use these Steiman pins, and again, I'm not slapping them really hard, I'm just tapping them and breaking the seal. And if I can get that out and just keep chipping away, then I can get this out without too much pain. Let's see if I can -- there I go. Then I'll disimpact it on the other side. You got another Steiman pin?
00:46:40
JOHN LAKE, MD: What color's the cement you're working with there, is that a cement that's the same color as bone or is it --
EDWARD J. McPHERSON, MD: Yeah, it is. It's actually -- it looks like a low-viscosity cement that's white. It's probably... I can't tell forensically, probably Simplex. That's the most common used in southern Cal, although Palacos is right up there. Palacos and Cobalt.

JOHN LAKE, MD: You find Palacos is a little easier to see than -- than the white cement?

EDWARD J. McPHERSON, MD: Much. I like -- I like the Palacos and the Cobalt only because they're low -- they're a higher viscosity, they're much more moldable, easier for me to interdigitate, but that's just my preference. Again, surgeons are like cats; there's a million ways to -- to -- take care of this.

JOHN LAKE, MD: Sure. Well, I like seeing it, so I like a little color, and here's someone that -- we have a mixed audience, obviously. We've got some orthopedic surgeons calling in, and we've got some people who are not orthopedic surgeons. Here's -- here's someone who asked, "What's the difference between a surgical scrub and the suits that you're wearing?" And I'll answer that one while he's working --

EDWARD J. McPHERSON, MD: Yes. So here we go. Here's our cement.

JOHN LAKE, MD: It just came loose nicely, and there's the cement, and there's a lot of bone left, isn't there?

EDWARD J. McPHERSON, MD: Yeah. Just -- you know, thank -- God bless Robert Klapper with the Ultra Drive. I think that's --

JOHN LAKE, MD: So you used two pins. You used one on either side so it came off symmetrically.

EDWARD J. McPHERSON, MD: Yes. And again, you don't bang them. You notice how I was just kind of tapping them; this is kind of finesse.

JOHN LAKE, MD: Well, while you're cleaning this up a little bit, back to the scrub suits. A scrub suit -- gosh, you see them all over. People sometimes wear them as pajamas, but it's just a comfortable set of clothing, and the scrub suit is underneath the gown. And the gown is sterile, and that's -- the scrub suit's not sterile, and that's the difference between the two. The gown is just a cover gown that is put on immediately before surgery, and that's sterile.

EDWARD J. McPHERSON, MD: I have one thing I got to do here, John, as soon as I get this pin out is I've got to go underneath the knee and get out some of the bone spurs and open that gap up so they can bend. So I'll have Dr. Vasquez take this out as soon as we get a pin-puller here. And get that out. Almost there, I'll get it in a sec. And what we'll do is we'll get a lamina spreader custom-made for joints. They're supposed to be for backs, but this one is custom-made for us, and I'm just going to open this up as soon as he gets that out, and it gives us a look here at the back of the knee. So we'll hold this right here, hold that very gently --

JOHN LAKE, MD: Now you're going to work on some of the posterior scar tissue, aren't you?
EDWARD J. McPHERSON, MD: Yeah, we got to get back into here so we can see, and Andre, I'll just come right here, and I'm going to get some of this scar tissue out. Get a Bovie. Bovie cautery, by the way, is a cautery device, and it lights -- centered in. Get some of this off.

JOHN LAKE, MD: This is like we were talking about at the beginning. This is the importance of this soft-tissue procedure here, which is -- which is actually as important or more important than the prosthesis itself; it's the soft-tissue balancing, and in this case, it's the removal of the soft-tissue scar that has formed that's precluding normal range of motion of this knee.

EDWARD J. McPHERSON, MD: Yeah. So what I'm going to do here -- you guys see okay in the back there with that camera angle?

JOHN LAKE, MD: We see it.

EDWARD J. McPHERSON, MD: Back here, behind this knee, I'm going to get some of these -- I think there's some bone spurs all back here, and I got to get this all out and just tap -- this is a -- a Z osteotome that we developed for what we call the high-flex knee system which is to break up any of these -- any of this scar tissue back here. Lean this towards me, gentlemen.

JOHN LAKE, MD: Well, frequently there's a large osteophyte back there.

EDWARD J. McPHERSON, MD: Yes, and I'm going to try to get this all right here. Poker. If we can get this light in. Just try to show you this. This is the one thing I've got to get out for you guys. I've got to show it to you, and I've got to get it out because it's going to help her a lot. Actually, I'm feeling this big piece of bone back here that I got to get out. This is a piece of bone right here, this piece. And if I can get that out, that'll really help get her flexing --

JOHN LAKE, MD: Is that a large osteophyte on the back of the femur there?

EDWARD J. McPHERSON, MD: Yeah, this is it. This is the bone right here. I'm getting this out. Then I can put my finger underneath there, and it opens it up. That's good. Rongeur. I've got a couple little small pieces to get out.

JOHN LAKE, MD: Well, that's certainly going to help with flexion.

EDWARD J. McPHERSON, MD: Yeah. Again, I got to be careful how far I go back here, but --

JOHN LAKE, MD: Absolutely. And then you're probably going to do the same thing over on the lateral side, correct?

EDWARD J. McPHERSON, MD: Absolutely. Same thing. Same thing. And if we ever get a chance, we could pan over to the x-rays, you can see the lateral view. You may see all those bone spurs on the side view that I'm getting out right now. I'm pretty happy with that side. You see, John, they pan in on that one camera. Okay, let's come back here. Okay, good. Bent Hohmann. And we got to get the same thing out over here, and give me -- give me my osteotome.
JOHN LAKE, MD: We finally have her x-ray up and can see that. Now one thing that I see and that you commented on earlier is that the patella is sort of low-riding, isn't it?

EDWARD J. McPHERSON, MD: Yeah, a little bit of baja, and that may bump when she bends. And that's why I'm going to bring down the joint. I'm going to cut the tibia a little bit, and then if I bring the joint line down a little bit, that may correct some of the baja and create less impingement.

JOHN LAKE, MD: You know, that's kind of a California term that we use --

EDWARD J. McPHERSON, MD: Yeah, we may have to define that for them.

JOHN LAKE, MD: Yeah, exactly. Somewhere along the line, and I forget who coined the word, but there's a normal distance between the tibial tubercle and the patella, and when that's low, that is when the patella appears low, why, the word "patella baja" was coined.

EDWARD J. McPHERSON, MD: I guess the true medical term if we want to be technicians and academics is "patella infera," yes?

JOHN LAKE, MD: That's correct. So do you think we need to do something about that?

EDWARD J. McPHERSON, MD: Yeah, I think we ought to bring her -- I'm going to put some augmentations on her femur. That's going to be the first thing I do and put some metallic augmentations -- lower the joint line by maybe about 5 millimeters. In fact, Stephanie's already got that up for me because that's my initial game plan. You always got to start with some plan.

JOHN LAKE, MD: So that -- that's going to get back to something that we talked about early on, which has to do with balancing the knee between the flexion and the extension gap, so -- so I take it what you're going to do is you're going to see how much space you have with the knee out straight and then you're going to see how much space you have with the knee bent and try and get those spaces equal, right?

EDWARD J. McPHERSON, MD: Reamer? Exactly right. So I've cleaned out the back. You can see, I can put my finger all the way back here, all the way back here, I'll release the PCL, capsule is opened up, so I've got a lot of space for that to go underneath. Now I've just got to make sure I can match them all up. And just open the upper canal; this is old -- this residual fat from the marrow, and I'm going to open this up and use this as my guide.

JOHN LAKE, MD: Yeah, and you're doing that because we have to think about the axis of this knee and whether it's in varus or valgus, and you have to line it up with something, so what -- what I think you're going to do is you're going to line it up with the femur and you're going to use intramedullary alignment for that?

EDWARD J. McPHERSON, MD: Yes. And that's based on prior studies at the -- valgus angle of the knee is five to seven degrees off of the normal knee, so --

JOHN LAKE, MD: And so you're going to pick what?
EDWARD J. McPHERSON, MD: Five. Because I think that helps kneecap tracking better than going to seven. If you go more valgus, then it pulls the kneecap over to the side, so I choose five, but that's my preference. No, I'm just going to go to the box. Now, if you want to, we could recut this. If we thought we needed to, we could make a freshening cut with the jigs and put this on, but I don't want to recut it. Actually, I want to build it back down, so we can dial in five degrees, we can resect whatever level we want, but in her particular case, what I want to do is I want to bring her joint line down and I want to save her bone, so in this case I'm not going to make any cuts with this jig system, but it's very advanced; you can cut five degrees, three degrees, seven, nine, whatever you want to, and you can get the level of resection to five millimeters, three millimeters, and you can recut them up here, too. So very versatile jig. The designers were very thoughtful in making the revisions palatable and consistent results using the jig system, so my hat's off to the designers.

JOHN LAKE, MD: So in this case, because we don't have to move proximal on the cut, I take what you're going to do is you're going to add some thickness to the prosthesis in extension, correct?

EDWARD J. McPHERSON, MD: Yeah, I'm going to bring it down, so I'll start at actually the trial in just a second. So this is a jig just for the box for the SSK, so we'll bring this up to here. Andre, if you can bring this over to here and hold this rod right there. And we'll just put this on where I want to sit. And the important thing here as we set this up is the rotation. And I'm just going to put that in, bend this up, and I've got to make sure -- hold that in -- here's the epicondyle, here's the epicondyle. I think that that's internally rotated, so I'm going to come back and rotate it right to there and pin it. And if you look at the bone natively, I think that this may have been internally rotated a little bit, so I'm going to externally rotate it to there, pin it on this one position right here.

JOHN LAKE, MD: Now, what are you judging that rotation by, the epicondylar axis?

EDWARD J. McPHERSON, MD: Yes. That's the only thing I got to go by here.

JOHN LAKE, MD: Correct.

EDWARD J. McPHERSON, MD: Or you can use the anterior femoral cortex. Some have used that. But if you look on this side, I'm flush. If you look here, I've got a gap. So what I've done is I've gone parallel to the epicondyles like this and I've rotated it probably -- if you look at the gap here and no gap here -- I've probably rotated it about seven degrees already, so she may have had a component of malalignment as a result of her stiffness. One of the common problems with revision knees is internal rotation of the femur, and that causes mismatch. So with that pinned, I'll put one more pin right over here and make sure that I do not push it down. Hold it in. I don't want to break it too much. Just hold it right there, and then I'll take this off and make my box cut for the SSK. And I'm not going to go all the way back.

JOHN LAKE, MD: Now, we've got to explain this box cut a little bit, and I'll take some time to explain that while you're doing that. And that is that you're going to stabilize this knee to substitute, or to allow the medial collateral ligament to heal by having a
center post that comes up off of the tibia that’s going to go into an open area in the – in the femoral prosthesis.

00:58:41
EDWARD J. McPHERSON, MD: Correct.

00:58:42
JOHN LAKE, MD: And so you’re making that space right now, and that’s what you mean by the box cut, right?

00:58:49
EDWARD J. McPHERSON, MD: Yes.

00:58:50
JOHN LAKE, MD: Now, this system has ability to fit quite tightly in that box or to fit a little bit looser? Which way do you like it?

00:59:03
EDWARD J. McPHERSON, MD: Um, if the ligaments are not stable then – I’m just going to make this cut – not stable, then I use the tight one, and that will help the ligaments heal. And if the ligaments are good, then I’ll use the lesser one. You have two options: that what we call just regular stabilize or the super stabilize. So I’m just trimming a little bit here.

00:59:24
JOHN LAKE, MD: Well, while you’re trimming away there, I’m going to show the audience how that works.

01:00:23
EDWARD J. McPHERSON, MD: Let me show you what I took off, John.

01:00:25
JOHN LAKE, MD: Let’s go back to the –

01:00:26
EDWARD J. McPHERSON, MD: See how I – I took this one off. You can see that’s where the spot for the—where the cruciate retaining knee right there. And then my other one is got a box where I can put it in. But what I want to show you is I want to decrease the flexion gap, so I’m going to go down a size on her and take that flexion gap out. That’s what—this is what she had. If I set the patella—or the femur flush where it was before in correct rotation, you can see I’ve got this gap. And this is where I’m going to start. This may be too small, and I may have to go up a size, but I want to get her flexion back to 120 degrees, even 125 if I can. You guys see the difference?

01:01:04
JOHN LAKE, MD: We can see that easily.

01:01:05
EDWARD J. McPHERSON, MD: All right. So let’s get that going. I put a rod on here, and we’ll put some augmentations to bring the femur down and then see what our trials look like, see if we can get things cemented, at least, before we sign off. And
gentlemen, again, I appreciate your patience. Revisions, as you know, are a little fastidious, and I really want to take my time getting the parts off. All right. So what we did – here’s the augmentations that I put on. So I’m going to bring this joint line a little bit further down and correct some of that baja. And let’s see how good enough we did with this preliminary fixation.

01:01:42
JOHN LAKE, MD: How big of an augment did you put on?

01:01:44
EDWARD J. McPHERSON, MD: Five millimeters on both sides. And again –

01:01:49
EDWARD J. McPHERSON, MD: So you’re moving your joint line distal and you’re increasing the flexion gap by using a smaller AP diameter, right?

01:02:00
EDWARD J. McPHERSON, MD: Yes, so I’m bringing the joint line down a little bit so the kneecap stays higher up here. And also, I’ve decreased—I’ve opened up the space in the back of the knee so it can go underneath.

01:02:12
JOHN LAKE, MD: Sure.

01:02:13
EDWARD J. McPHERSON, MD: So that’s how I’ve kind of addressed that, so. First thing we’ll do is put this insert in. This is 10 mm. This is the post that’s not too tight. And I’ll put that underneath. And the first thing I want to do is see if the knee comes out straight. And you can see that it does. It’s a little bit back kneeed. And we’ll see how she bends in this direction, and you can see that she’s bending not too bad. I’ve got a little bit of hole in the retinaculum where I took that off, but we’re not doing too bad, and I’ll patch that up later on. So I’m sitting – I’m sitting right now about 90, 95 degrees, and that’s not too bad. I can’t go any smaller, in terms of the gap, because this is the smallest implant we have. I mean, that’s the smallest that we make of any system available, so I’m looking pretty good there.

01:03:09
JOHN LAKE, MD: So you think your flexion and extension gaps are balanced?

01:03:12
EDWARD J. McPHERSON, MD: Not quite. I think I got to go—I got to get my extension gap a little bit farther down, and I don’t want to compromise that. If I increase the thickness here, she’s not going to bend. So what I’m thinking about doing here is if she’s back kneeing it’s increasing this gap right here of coming out, so I’m going to go to the next size augmentations and increase her augmentations on the femur. And that’s how I’m going to address this because I really want her to bend. So I’m going to take this off.

01:03:48
JOHN LAKE, MD: And that augment is going to screw right on the –

01:03:52
EDWARD J. McPHERSON, MD: Yeah, right on –

01:03:52
JOHN LAKE, MD: bottom of that prosthesis or the top of it, depending on how you look at it. And you went 5 mm initially, so now you’re going to go 10 mm.

01:04:00
EDWARD J. McPHERSON, MD: The next size, 10 mm, because I don’t want to sacrifice any of the flexion.

01:04:09
JOHN LAKE, MD: And you’ve got the option of using an augment on the back of the prosthesis if the femur’s too thin, don’t you?

01:04:15
EDWARD J. McPHERSON, MD: Yes. And I’m just releasing a little bit of leftover remnants of this PCL. I just want to come underneath and release that. Rongeur? Okay. And I just want to make sure that I’m all set here. And just trim this. Could have put a recutting block on here, but the more bone you cut, the less you have for later, so I’m going to try to use what I have and not take away much, okay? Okay. Let’s hold that. And hold that. And pull that. Okay, so this time we got more augmentations on the femur. You see that?

JOHN LAKE, MD: Yeah, I see it.

EDWARD J. McPHERSON, MD: We’re going to pull that down and hopefully get rid of that back-knee. Rongeur, real quick. Keep that kneecap low as we can. This bone’s a little bit weak, so I think I’ll use some screws. And again, I’m going to put that on right to here, make sure my rotation looks good – it does. Impactor. Right here. Impact it lightly. Perfect. Good. And we’ll put that same insert in. It’s a little bit thin. There we go. All right, so that’s where we’re sitting right now.

JOHN LAKE, MD: Now, I would point out that these are not the final parts that we’re going to use. These are all practice parts, aren’t they?

EDWARD J. McPHERSON, MD: Yep, these are all practice parts. Now I have a straight knee and I haven’t sacrificed the flexion gap. And now I can bend—I can bend it to about 90, 95. I’m not unhappy with that at all. Patella’s sitting right here. I got a little hole in the retinaculum when I did that scar tissue release.

JOHN LAKE, MD: How about the quadriceps mechanism? Is that tight up top?

EDWARD J. McPHERSON, MD: Yeah, it is. Remember, but she started out with a knee that’s 45 degrees for what, two years? So you can’t get—you’re not going to get 120 degrees right out of the gate. I can show you the quadriceps right here. It is firm.

JOHN LAKE, MD: Normally we bend a knee before we put up the tourniquet, but in this case you couldn’t do that, could you?

EDWARD J. McPHERSON, MD: Couldn’t do that at all. Just kept it up straight. So, I mean, I’m off—I’m off to what, 95 right now, so—

JOHN LAKE, MD: I think you have a little more flexion now than you did the first time around.

EDWARD J. McPHERSON, MD: Yeah. But more importantly, as I got my extension gap back without sacrificing flexion, you can see how much room I’ve got from my patella now.

JOHN LAKE, MD: Yes. You’re not tight at all now, are you?
when we go to the final assembly because, you know, I’ve released it all off the tibia. So I got that, I’ve got this gutter cleaned out. Rongeur? And what I’m going to do, John, is I’m going to cement my stems in. She’s relatively small. You can use what we call noncemented stems, and you pressfit them in. But sometimes when the bone’s a little weak, they can cause some shin pain, so I’m going to cement these today. I’ve got things cleaned up pretty good.

01:07:40
JOHN LAKE, MD: Now, do you put a plug in the femur and the tibia when you do that?

01:07:42
EDWARD J. McPHERSON, MD: Yes, I do, and I use smooth stems, too, because if I ever had to take them out for any unknown reason like an infection or something else—trauma—I would really have a tough time getting them out. And the bones in the tibia tend to be a little weaker than the femur. So I’m cleaning up pretty good. I’m happy with everything right here, so the only thing that’s limiting me now is my quadriceps mechanism. I got—my flexion gap’s not too tight at all. I feel that my flexion gap is not what’s holding me back, so I’m pretty happy. So I’m going to start putting these parts together on the back table. So what we’ll do is we’ll start taking these out and cementing these parts in place. Want to trim this kneecap bone just a little bit. If I can get going here. Everybody still seeing okay? I hope I haven’t been in the way too much.

01:08:39
JOHN LAKE, MD: Now, we have a tourniquet up, don’t we? That’s why there’s not any bleeding that we can see and you’re seeing so well. That tourniquet time has been a little over an hour, hasn’t it?

01:08:50
EDWARD J. McPHERSON, MD: Yeah, a little over an hour. We put it up a couple minutes before you signed on just to where we didn’t have to take that extra time putting it up, so yeah, I like to keep my tourniquets under 120 minutes. I will go over if I need to from time to time.

01:09:03
JOHN LAKE, MD: Oh, I think most of us go by that rule: 2 hours maximum. And now, it’s going to take that cement a little while to harden, isn’t it?

01:09:11
EDWARD J. McPHERSON, MD: Yes. In our room it takes about 13 minutes, so we’re going to—as soon as that tibia is in, we’re going to stagger the cement so we can get this. So I will use an extractor here. We’ll take the femur apart.

01:09:25
JOHN LAKE, MD: Now, are you going to cement both components simultaneously or are you going to do them serially?

01:09:29
EDWARD J. McPHERSON, MD: I think I’m going to stagger—stagger, serial, kind of halfway in between. So that way I know that we have everything exposed. Thank you. Okay, good. And I’m going to put two screws in these holes, just for a little bit of augmentation there. So we’ll do that before we cement. And on this side what we’ll do is we’ll let the patella fall to the side, bend the knee up. Can I get a bent Hohmann? And I will put this here just to protect the extensor. Right there. And we’ll put a blue towel over here just to protect everything on this side. I don’t like to have the skin touching implants or bone. Notice we have the Ioban dressing. That is a sterile dressing on the skin. None of it has come off or peeled, so there’s actually not true skin touching these implants.

01:10:19
JOHN LAKE, MD: I think that’s important.
EDWARD J. McPHERSON, MD: I think that’s important, too. I can’t stress that enough.

JOHN LAKE, MD: I remember being taught a long time ago, before we ever had the stuff that sticks this well, not to touch the skin with your hands or even with instruments, and this Ioban stuff that sticks like this sure makes a difference.

EDWARD J. McPHERSON, MD: Yeah. The Ioban, I think, sticks because they have on the io prep a little bit of adhesive in that formula. And I think it’s Reinhold Ganz in Germany or Mueller, one of them, says they’ve done over 3,000 surgeries without one prosthetic joint infection, and they attribute that to the spacesuits and the Ioban, and that’s their philosophy. So we have this all cleaned up. What we’re going to do is we’re going to clean this canal with a little bit of a wire brush.

JOHN LAKE, MD: You’re going to do the tibia first, aren’t you?

EDWARD J. McPHERSON, MD: I’m going to do the tibia. So I just want to get all the loose debris out of here.

JOHN LAKE, MD: So now that practice component that you had, that’s being recreated on the back table as we work here?

EDWARD J. McPHERSON, MD: Yeah, I’ve got to do that right here, and I’ll have Dr. Vasquez wash this out just a little bit. And I want to show you on the back table while we’re washing out the tibia here. We’ll have Carlos clean this a little bit. Got LAPS? And what I’ve got to do is I’ve got to recreate this offset. So if we come back over here, you know, we’ve set this up straight offset medial. And if you want to look at the mark, I have a mark here that shows me exactly where that mark has got to go. And I’ll show that right here. And there’s my mark. It’s a little off the 45 degree mark, so I’m going to recreate that with my implants. So that’s my rotation set right there. So we’ll get the tibia and the first thing I’ll do is assemble this over here onto this, impact it flush, and that gets me this.

JOHN LAKE, MD: Now, what’s going to hold that in? You just knocked it together. That’s—

EDWARD J. McPHERSON, MD: Well, there’s a connecting device here. When I put this in, it locks it in.

JOHN LAKE, MD: So that’s a taper plus a screwlock device.

EDWARD J. McPHERSON, MD: And a screwlock. So that’s impacted in, there’s a lock mechanism, and then I impact this into here. And if you want to you can put this dial—you can put the dial in on the front. You can take these little—take these plastic parts out and put it in and you have a dial or you can look at it right as it is, right in front. And in this case I don’t want to take the plastic parts out because I want the cement interdigitation, and I’ll match it up exactly to where I was. So I have, in this case—

JOHN LAKE, MD: And that’s a taper device, too, so when you hammer those two together it’s almost a weld, isn’t it?
EDWARD J. McPHERSON, MD: You can mix. So what I’m going to show you is I’m a little bit—where’s my mark here, I’ll show you. I’ll line it up exactly where it was. My mark here is a little bit off the midline just like that. So I’m going to mark that just right here, just off of the midline right here. There’s my midline here, and I’m off a little bit like that. Or if you’re a different type of cat, you could take the dial, punch these, and you can go exactly on the mark by the degree. But I think I’m confident enough in my computer cerebral navigation to get this lined up the way I want to right here. And so, notice I have—You got an impactor? We’ll use this. I’ll just impact this flush. And this is my implant that’s going to go in place. Take the blue out of the way so you can see that. There’s my offset the same as my implant, okay? Notice my stem is smaller because I’m cementing, so this held into the bone, this is going to be a little less than the bone, okay?

JOHN LAKE, MD: Right, and that’s because you’re going to have cement that fills up that space, and that’s the grouting material that we talked about.

EDWARD J. McPHERSON, MD: Right. Last thing I’ve got to do, once I’ve impacted, I’ve got to screw this and lock this into place. Stephanie has already made my cement. We use Palacos. Palacos has got a little bit of a green tinge to it; cobalt’s got a little bit of blue. Biomet makes both of these. I’m using the Biomet Palacos right now. Zimmer also has Palacos as well.

JOHN LAKE, MD: Now, are you going to put antibiotics in that?

EDWARD J. McPHERSON, MD: Yes, I do. I have 1 gram of Vancomycin in there. And next thing we’ve got to do—And while I’ve been doing that, Dr. Vasquez has washed this bone out really nice, so we’re all clean and ready to go. I’m going to take one more nice, clean blue towel around here.

JOHN LAKE, MD: Now, you don’t want that cement to run clear down to the ankle, do you?

EDWARD J. McPHERSON, MD: Absolutely right. So that’s the one last thing I’ve got to do—Thank you. Get a hold up there—is we’re going to put that cement restrictor in. We have measured the cement restrictor to the implant, so we’re a little bit farther than the implant. So I’ll put this in, snap this into position, stick it up just a little bit, just right there.

JOHN LAKE, MD: What’s that made out of, polyethylene?

EDWARD J. McPHERSON, MD: Polyethylene. And I’m nice and clean, nice interdigitation. And rongeur really quick. I’ve got one little piece I want to take out of here. And when we’re getting this cemented in, then I want to put those screws in, Steph. So we’ll do this right here and just inject this back. I feel pretty strongly about using antibiotics in my cement with revision. What about you, John?

JOHN LAKE, MD: I do.

EDWARD J. McPHERSON, MD: And we come all the way up to the top. I got one little hole I got to work on, so Carlos will hold onto the hole right there.

JOHN LAKE, MD: And so now you’re going to pressurize that a little bit?
EDWARD J. McPHERSON, MD: Yep. Going to pressurize it just a little bit, just like that. All the way around. Interdigitate all the holes.

JOHN LAKE, MD: We can see the green color nicely.

EDWARD J. McPHERSON, MD: Yeah. Now, hold this nicely right here. My rotation is right here, my implant’s going to go in on that mark. And again, I’m centered as I go. Make sure that comes in, check my rotation as we go. Notice we’re pressurizing as we go. Impactor. And now I’m really tight, so now I know that we have a lot of cement, so we’re just going to impact this flush as we go, give the bone a little bit of room to breathe as we impact it down. An important rule I learned, John, is that once it’s down, it’s down. You can’t change it because you’ve ruined the cement, so I don’t change it.

JOHN LAKE, MD: That’s right. If you rotate that now, it’s not going to work, is it?

EDWARD J. McPHERSON, MD: It’s not going to work. Plus, the rod that I put in has got splines, so it will dig in a little bit, so.

JOHN LAKE, MD: Now, you’re probably six or seven minutes along on this cement batch?

EDWARD J. McPHERSON, MD: Um, what do we got for cement time. I think we’re six.

SURGICAL TECH: 3:40.

EDWARD J. McPHERSON, MD: Actually 3 minutes and 40 seconds. We call them out every minutes.

JOHN LAKE, MD: So in about something like 8 or 9 minutes, that’s going to be hard, isn’t it?

EDWARD J. McPHERSON, MD: It’s going to be hard. And we’re going to get two screws for the femur and put them in those holes to help augment it. Just kind of like rebar.

JOHN LAKE, MD: Right, and that’s just to strengthen the construct on the distal aspect of the femur, right?

EDWARD J. McPHERSON, MD: Yes. Yep. Perfect. Good. Dr. Vasquez has got that all covered up. I’m looking good. Notice we’ve got a little bit of gap of cement there because remember, cement is the surgeon’s friend. It fills up any interstices, or any gaps leftover. Rongeur.

JOHN LAKE, MD: Someone here asked how long a normal surgery lasts for this.

EDWARD J. McPHERSON, MD: [laughs]. Um, I use less invasive incisions for the knee, so with my less invasives, I’ve been going longer. My tourniquets are around about 70 minutes, and I usually close with the skin up, so 60 to 90 minutes for the first time. Revisions are always longer.
JOHN LAKE, MD: Yes, this is always a lot bigger procedure than a primary one, isn’t it? But you’re moving right along at kind of a primary speed for a lot of us.

01:18:59

EDWARD J. McPHERSON, MD: Yep. So what I’m doing is if this sets up, I’m just going to keep this here and not disturb it. I’m going to come over here and put this here. Got a bone hook for me? And suck out this canal. I want to use this and have Dr. Vasquez kind of just help hold this up just a little bit, get this all cleaned up. And I notice I’m not trimming much bone on that femur. No, hold still. And get this all cleaned up. But we have a lot of room for interdigitation down below in the canal, and that’s why I like to use these cemented stems.

01:19:38

JOHN LAKE, MD: Well, and you need that because you need the stability, don’t you?

01:19:41

EDWARD J. McPHERSON, MD: Absolutely. I think with all that—you can see this bone’s really soft, so I really don’t want to really on that. Okay, got those screws? I’m going to just use these just to help, help support things for stability. I don’t think these are necessary, but I think they do help. What do you think, John?

01:20:05

JOHN LAKE, MD: Well, I think you’re building a composite structure, and it’s like all composite structures, they tend to work. It’s like concrete with rebar and it’s like fiberglass that has glass and epoxy resin. You’re building a construct.

01:20:20

EDWARD J. McPHERSON, MD: Right, right. And I’m going to wash this as our other one is cementing up. You got a blue towel? Right here. I’ll put this right here just to help. And pull that right there. So we have our exposure. Notice it takes about five hands in this room, doesn’t it?

01:20:45

JOHN LAKE, MD: It certainly does.

01:20:46

EDWARD J. McPHERSON, MD: It’s a lot of work on a revision.

01:20:48

JOHN LAKE, MD: And so you’re going to plug the femoral canal too, aren’t you?

01:20:52

EDWARD J. McPHERSON, MD: Yep. Got to do the same thing.

01:20:54

JOHN LAKE, MD: Go through the same procedure here.

01:20:55

EDWARD J. McPHERSON, MD: Same thing.

01:20:57

JOHN LAKE, MD: It shows the importance of practice parts because you’re not—you know where you’re going now. You’ve been there before with the practice parts.

01:21:05

EDWARD J. McPHERSON, MD: Yep. Notice the bone cleans up real nice. It kind of looked ugly before, but it actually really does clean up really nice.

01:21:11

JOHN LAKE, MD: And that’s important because of the need to interdigitate that cement into the bone, isn’t it?

01:21:19

EDWARD J. McPHERSON, MD: Right. I can’t emphasize that microinterdigitation. You can—if you really focus in on the canal, gentlemen, you can see all the little interdigitations that you can have for that cement, so if you have nice, dry bone, you can get that interdigitation really nice. And in fact, Matt Reynolds—bless his soul, he
passed away a year or two ago—used to use a hairdryer-type device, and he
developed it and would even dry it out with a device. And it was really cool.

01:21:45
JOHN LAKE, MD: That’s interesting.

01:21:47
EDWARD J. McPHERSON, MD: Yeah. So anyway, I’ve got him all cleaned up. I’m
going to put my cement restrictor in.

01:21:52
JOHN LAKE, MD: And the next cement batch, is that being mixed?

01:21:55
EDWARD J. McPHERSON, MD: I’m hoping. Stephanie, you got that other one mixed?

Dr. Lake wants to know if you’re keeping up.

01:22:00
STEPHANIE: I’m sorry?

01:22:01
EDWARD J. McPHERSON, MD: Dr. Lake wants to know if you’re keeping up with that
mixing.

01:22:04
STEPHANIE: Oh, I’m way ahead of you.

01:22:05
EDWARD J. McPHERSON, MD: She’s mixing, she says. All right.

01:22:09
JOHN LAKE, MD: So you’re probably almost hard on the tibial side, aren’t you?

01:22:12
EDWARD J. McPHERSON, MD: Yes, probably. Notice we’re really kind of multitasking
here. With a revision, I want to make sure—thank you for reminding me—yeah. A
little bit, just a little bit more to go on that. Notice I haven’t touched that implant at
all. Don’t want to move it, don’t want to put any pressure on it. That’s why I have
Andre over there holding and retracting. I have Dr. Vasquez over here holding,
making sure that everything’s out of the way. Okay.

01:22:44
JOHN LAKE, MD: This cement is the same stuff that a Corian counter is made out of,
so it’s actually very hard when it’s hardened. And this cement that is on the tibial
side there is probably only about a minute away from hardening now. It turns quite
hard very fast. It stays in a doughy stage and then it just turns.

01:23:05
EDWARD J. McPHERSON, MD: Now, the cement monomer, as you know, sets this up
and starts the catalytic reaction. And you can make these really thin and runny or
you can make them doughy. I’m just a doughy-type guy. I like doughy. It doesn’t
run everywhere. Some people like the runny stuff, but this is just my preference,
and I’m just one type of cat.

01:23:28
JOHN LAKE, MD: How about heating the prosthesis up to make it go a little faster.
Do you do that?

01:23:31
EDWARD J. McPHERSON, MD: Yes, I’ve done that. We’ve warmed up the cement,
we’ve warmed up the prosthesis. Today I didn’t want to rush it too much, just
wanted to make sure that we’re going okay, but yes, that’s a very nice trick, John.
So I’m just going to insert this in, get the interdigitation underneath. And last minute
for any gaps, make sure that everything is fitting is a little bit of cement. We’re
break up—and again, we’re using an injection gun here. Just put a little bit of cement
around there, then a little bit of cement there. I think we’re okay here, gentlemen,
yes?
JOHN LAKE, MD: I think it’s important to note that you didn’t fill up any gaps with cement that are large. You used the metal parts on the bottom of that prosthesis, didn’t you?

EDWARD J. McPHERSON, MD: Yes, and that’s because I barely got 95 downsizing. I actually downsized a lot just to get her to 95, which makes me think in her case, you know, with being 5-foot tall, she’s got a really small anatomy. And that’s the problem with a lot of revision systems: they’re just not equipped for the smalls, the small patients. And that’s one—what I’ll talk about now. That’s—as we do more and more revisions, the smaller patients are really going to need them just as much as our other patients. Also notice that she is a female, and this is a pretty good match for her, the AP to mediolateral ratios on the revision knee, on the Vanguard, are all designed to fit the majority of male and females throughout. So we don’t need gender-specific implants, in my opinion. So I’m pretty happy with what we have.

We’re just going to clear underneath here. Tonsil. Again, we’re going underneath, making sure that we’re cleared out. Not going to put any pressure on that tibia until we’re set, and Stephanie will let me know when we’re set on that. Twelve on the first? Okay. So we usually set at about 13:30 on the cement in this room with the humidity that we have here. So I have everything around. And when we do this—got that out, got that one little piece out there. Gentlemen, right there. Okay. Hold this and get this out. Hold your finger here and hold that. Pretty happy underneath, pretty happy underneath. Nothing under there that I need to get. Maybe just a little bit. You got a curved osteotome, half-inch straight? Hold that right there. Just a little piece of bone here I want to get out while I’m doing this. Half-inch straight. You guys are going to see I’m going to go way back here—half-inch curve, I’m sorry—just—

JOHN LAKE, MD: Well, we have awful good visibility. We’re seeing everything that you’re seeing except right around that corner.

EDWARD J. McPHERSON, MD: Just want to get this out...without ruining anything. Rongeur. So I just want to get way—just this little bit. Every little—every little bit counts in a revision. Just want to get this all out. So way out there. And last—when we’re done with this, we’ll trial again. Don’t want to impact too hard. I think we’re set on the first.

JOHN LAKE, MD: Well, you’re going to trial again, meaning that you could put on some different-size plastic components, right?

EDWARD J. McPHERSON, MD: Yeah, so what I’m going to do right now is I’m going to hold this and let this femur set right now. We got a trial insert. And again, I’m going to bring this in extension and let the cement compress.

JOHN LAKE, MD: Now, that’s another practice part, isn’t it?

EDWARD J. McPHERSON, MD: Yeah, that’s the practice part. Just want to make sure I didn’t mess up and do anything wrong. I’m still straight. If you look at this, I am complete straight, so I’m happy with that.

JOHN LAKE, MD: Now, if you were too loose, you could put in a thicker one, right?

EDWARD J. McPHERSON, MD: A thicker one now if I wanted to. So I’m going to stay with that one and when 1—you can see now that when I stretch this, if you look on
the top, this is why I’m going to use the superstabilized part because I really release
the ligament from my exposure. So if I stress this, you can see it opens up.
01:28:04
JOHN LAKE, MD: So you’ve got the looser part in there right now.
01:28:05
EDWARD J. McPHERSON, MD: I’ve got the looser part; I always start with the looser
part. And if I can get away with it, I can. The general rule is the least constraint
possible, so you don’t want to put too much stress on the bone. So I’m going to—
knife—I’m going to open up the constrained version, or the really stabilized,
superstabilized version of this to hold that ligament out the heel. Tonsil. And that is a
10 mm insert. We’ll take that cement out. And again, I don’t want to play with this
knee too much. I really want the cement to set because if you make any—
01:28:45
JOHN LAKE, MD: Right. You don’t want to move it around at all now.
01:28:47
EDWARD J. McPHERSON, MD: Right. So I’m going to let that set. And one thing I am
going to do is I’m going to inject this with a pain cocktail.
01:28:53
JOHN LAKE, MD: Well, tell us about that. What are you going to put in there? And
what’s that going to do for us?
01:28:57
EDWARD J. McPHERSON, MD: That’s going to help this patient for the first 24 hours,
in terms of pain management. We’ve studied this, gone to conferences and studied
here at our center, and if John could go out there and talk to you a little bit, you can
talk to him. Or has he got a mike?
01:29:18
JOHN VORBLUSKI, MD: I’m actually miked in.
01:29:20
EDWARD J. McPHERSON, MD: Hey John, are you turned on?
01:29:21
JOHN VORBLUSKI, MD: Yeah, I’m here, Dr. McPherson.
01:29:23
EDWARD J. McPHERSON, MD: Tell me about the cocktail that we’ve been working on.
We’ve been working on this for about 2 or 3 years, and you can watch as we inject
it.
01:29:29
JOHN VORBLUSKI, MD: Yeah, this cocktail we have here is a combination of
Ropivacaine 100 mg, Epi 100 mikes, Toradol 60 mg, Depo-Medrol 80, and we use 10
of morphine or Duromorph in there with the idea that we’re trying to block all of the
pathways as far as local anesthetic, preferal new receptors, if you believe in that. If
not, systemic uptake of the morphine also decreasing inflammatory response in
and around the joint area. If you noticed, Dr. McPherson is not just simply pouring it
into the arthrotomy; he’s actually injecting it into the local tissue, and that’s a key
component to actually, you know, having the local anesthetic work properly.
01:30:15
EDWARD J. McPHERSON, MD: Hey John, can you go over that cocktail again? I think
your mike was low. And ask them what Ropivacaine is, what the Marcaine is, or the
Duromorph, for those who need to get a little bit of extra knowledge there.
01:30:31
JOHN VORBLUSKI, MD: Absolutely. Ropivacaine, the other name is Naropin, is a local
anesthetic. The reason why we use that instead of Marcaine or Bupivacaine, which is
more commonly seen or heard of, is because it has less cardiotoxic side effects, in
case there was an inadvertent intervascular injection. Morphine or Duromorph,
Duramorph being the preservative-free portion that you would find being used in spinal anesthetics or epidurals, and Toradol being a non-steroidal pain reliever. Also Depo-Medrol trying to provide any anti-inflammatory response. The Epi is simply there to prolong the duration of action of the local anesthetic and also to decrease bleeding in the area.

01:31:16
JOHN LAKE, MD: Now, you have some epinephrine in there, too?
01:31:19
EDWARD J. McPHERSON, MD: Yeah.
01:31:20
JOHN VORBLUSKI, MD: Yes.
01:31:20
EDWARD J. McPHERSON, MD: I’ve been impressed using some epinephrine how much it helps cut down on the bleeding, and I think that’s an important component of it.
01:31:28
JOHN VORBLUSKI, MD: Yeah, it’s essentially 1:200,000 concentration. Naropin doesn’t come, as far as I’m aware, commercially with epinephrine in it, so we do mix it ourselves and put it onto the field steriley for Dr. McPherson.
01:31:39
JOHN LAKE, MD: What’s the total volume you’re using?
01:31:41
JOHN VORBLUSKI, MD: Total volume diluted with saline is 50 cc’s.
01:31:44
EDWARD J. McPHERSON, MD: The other thing, John, tell him about our femoral nerve blocks, how you manage that on the floor. My patients have really benefited, in my opinion, with having the femoral nerve block.
01:31:55
JOHN VORBLUSKI, MD: Yeah, we’ve—we generally try to do regional anesthetics in all our orthopedic procedures. With that being said, we used to use Duramorph as our primary pain reliever. The problem with that being is the increased nausea and vomiting and pruritis on the floor. Patients were happy that they had pain relief, but at the same time the itching and nausea and vomiting would just cause nearly as much irritation. We’ve switch to a multi-modal therapy where we use preoperative Oxycontin and Celebrex to try to prevent any pain before surgery. The patients for primary knees and revision knees all will get a femoral—continuous femoral nerve block that is inserted preoperatively. We do our initial injection with 0.2% Ropivacaine 30 cc’s. Our infusion on the floor is Marcaine 0.1%. And we run that generally at about 8 cc’s an hour. Those infusions are maintained for the first 48 hours. The patients are able to ambulate with that, and that’s why we use such a light concentration of Marcaine. Our goal is to take away the majority of the pain with minimal motor blockade. So with assistance, they are able to ambulate without much difficulty. That will provide pain relief to the anterior portion of the knee. You still may have some posterior compartment pain, but statistically that’s in about 1 out of 10 patients.
01:33:21
JOHN LAKE, MD: So you’re putting a catheter down by the femoral nerve, is that correct?
01:33:24
JOHN VORBLUSKI, MD: That’s correct. We use a nerve stimulator and place a catheter.
01:33:28
JOHN LAKE, MD: Right. And then you’re leaving that in how long?
JOHN VORBLUSKI, MD: Generally 48 hours. Generally the third day we’re taking it out first thing in the morning and with the idea that we want them to go home that same day.

JOHN LAKE, MD: How much motor weakness do you see?

JOHN VORBLUSKI, MD: The motor weakness generally isn’t too bad. I mean, patients will be able to lift their leg. They may complain of some weakness, but they do have full—full use of the leg. And that is one of the reasons why we don’t do a combined sciatic block. We want to give them the ability to have good motor sensation and sensitivity in the foot for when they are ambulating so that they have a firm toe touch.

JOHN LAKE, MD: Well, we’ve found it very important to train the staff to know when one of these catheters is in place so that they’re aware that there could be some motor weakness and to not expect to have complete, active quadriceps control.

JOHN VORBLUSKI, MD: Yeah, absolutely. That is a—that’s a very good point. The preoperative teaching for both the patient and the teaching with the staff when you start using single-shot or continuous femoral nerve blocks is definitely very important to prevent any inadvertent falls.

EDWARD J. McPHERSON, MD: See, John, I can still—still push this so I’m—even though I’m really anxious to get off and get this closed for you guys, I really got to respect this cement because if I move right now, I’ve got—I’ve got a gap and it’ll stay gapped. So I really got to just hold pat, hold my position till we’re all set.

JOHN LAKE, MD: That stuff gets pretty hot, too, doesn’t it?

EDWARD J. McPHERSON, MD: Yeah, it really does.

JOHN LAKE, MD: Especially when you have a big ball of it like in your hand.

EDWARD J. McPHERSON, MD: Yep, it can burn. That’s why you always want to—

JOHN LAKE, MD: Well, I don’t think it burns in people because it’s got such a thin layer versus the big ball that you have in your hand.

EDWARD J. McPHERSON, MD: Right. The surface area for dispersion of heat in the knee is so great that you would never really get a significant burn with it, but you got to still respect it. So I’m going to close it with drains.

JOHN LAKE, MD: Do you use one of the reinfusion drains?

EDWARD J. McPHERSON, MD: I don’t. I probably should, but I don’t. We do pretty good, I tell you, with the injections with the epinephrine. We do pretty good.

JOHN LAKE, MD: It certainly does cut it down.
JOHN LAKE, MD: Here’s somebody that was asking about the mixture of local anesthetics that we use. And have you ever dealt with somebody who was allergic to morphine and used any other sort of narcotics, such as Dilaudid or Opana? I’m not sure that I know what Opana is.

JOHN VORBLUSKI, MD: Yeah, I’m not—not sure that we have that or are familiar with what it is, as well. You could use Dilaudid as well since it is a long-reacting opioid. However, if they’re allergic to morphine, a lot of times we’ll just leave it out simply rather than to, you know, play around with anything else.

JOHN LAKE, MD: I think that’s what I would do. I’d just stay away from it. And I don’t—I don’t use that in what I inject either, so I’d be comfortable without it.

EDWARD J. McPHERSON, MD: All right, John. You can see when I bring this up our cement just set. If I flex this up and rotate, that’s what you call mid-flexion instability. That’s an article that I’ve written, hopefully it will get published this year. But if the collateral ligament’s loose, even though you’ve got tension, it can still rotate out. So the next step is to put the next stabilized post in this system, which is the superstabilized knee.

JOHN LAKE, MD: And that’s what we’ve got up on the screen for everybody to see right now.

EDWARD J. McPHERSON, MD: Can you hold this right here? And don’t let this touch and scratch because I got brand new parts. That’s good. And I’ll hold that right there. And dry LAP And we’ll put the larger constrained insert right here. And this is the bigger post that doesn’t allow any rotation. And we’ll just let it rest there. I’ll put the locking pin in place and then we’ll connect this. Notice we have a little offset here to help get this pin back in. This locks it in. This lock mechanism’s been used for years and years and has proven durable. I’ll let this rotate in. And you’ll notice when we rotate it in, it goes way in. And there’s no way that when you bend this and you stress this, there’s no way that that post can rotate out. It’s stable. Gives a little bit of flexibility for the ligament to take over if it needs to and when it heals up. So that’s as far as that’s going to go. I’m still nice and straight. I’m very happy with that. My bending is still—I’m pretty happy with that as well. Remember, the tourniquet’s still up. Dr. Lombardi says that you can still get a little bit more bending after the tourniquet is down. My patella is sitting right in the middle. I don’t have to do any more release in this hole that I made on the way in. And I’m going to do something a little bit, um, contrarian to others. I’m going to put the drain in, and I’m going to close this with the tourniquet up. And that way I cut down on my blood loss. I haven’t had any major incursions in the back of the knee. I feel comfortable closing in flexion. I’ve been doing that for the last couple of years. But, you know, again, another way to skin a cat.

JOHN LAKE, MD: You close it in flexion.

EDWARD J. McPHERSON, MD: I do.

JOHN LAKE, MD: That’s what I do. I find that it makes a big difference.

EDWARD J. McPHERSON, MD: It makes—I feel it makes a really big difference.
JOHN LAKE, MD: Now, I must admit I usually take the tourniquet down and I go looking for bleeding points.

01:38:56

EDWARD J. McPHERSON, MD: If I’m anxious I will do that too. So the first thing I will do is put one stitch here in the corner just to know where I am. So number one? What I’m going to do first here is a little bit of what we call FloSeal, a little thrombin to help with the sealant of the knee. It’s just his FloSeal, it’s just a thrombostatic agent with collagen gel to help with the bleeding. There’s a nice little video out with this and a study showing that you can—you can make a small incision experimentally into a heart, put this in the middle of that hole, and it actually clots it up. So is that it? No more?

01:39:37

JOHN LAKE, MD: Could I get a repeat slowly of the doses and—or the volumes of the mixture that you’re using for your injectable?

01:39:46

JOHN VORBLUSKI, MD: Absolutely. The first component is Ropivacaine 100 mg, epinephrine 100 micrograms, Toradol 60 mg, Depo-Medrol 80 mg, and Epinephrine 100 micrograms with a total volume of 50 cc’s.

01:40:10

JOHN LAKE, MD: You know, I add more saline and bring that up to 100 cc’s and then I get a little—I get it spread out perhaps a little more.

01:40:19

JOHN VORBLUSKI, MD: Yeah, that does make sense. Typically, you know, we use that both on our revisions and our primary knees. Our primary knee incision typically is somewhere around 3 to 4 inches, so with that—with that type of volume, a lot of it would be seemingly left in the syringes at the end. Although for the revisions, that could be a little bit better.

01:40:47

EDWARD J. McPHERSON, MD: All right. Got a couple starting stitches. Make sure that my drain is in the lateral gutter. Bring the knee up to 90 degrees, and we’re going to close in that position right there. And I will start here.

01:40:58

JOHN LAKE, MD: I find that helps. Closing the knee flexed like that, it just keeps things from being as tight next time you go into flexion.

01:41:06

EDWARD J. McPHERSON, MD: I agree.

01:41:09

JOHN LAKE, MD: And I think you get a better job on the skin. I think the skin tends to go together without mismatched edges.

01:41:19

EDWARD J. McPHERSON, MD: Yes.

01:41:20

JOHN LAKE, MD: Now, what do you do about moving this knee postoperatively? When do you start that?

01:41:24

EDWARD J. McPHERSON, MD: Tomorrow. I mean, I’m not going to use a CPM. I believe that if you stay in bed, you’re more at risk for thrombo-thromboembolic events, so I usually mobilize them, get them walking right away. And if I close the knee at 90 degrees, again, the Vanguard is a high flexion, very patella-friendly design. It will bend quickly, and I have not had to use a CPM with the Vanguard. In fact, I stopped—when we started doing the prototypes of the Vanguard back in 2001, they were bending so nicely I just kind of stopped the CPMs altogether because the patients really liked just getting out of bed and walking and moving on their own.
JOHN LAKE, MD: Do you walk them on the same day or the next day?
EDWARD J. McPHERSON, MD: Whoop. I walk them on the same day in the morning and I walk them the next day, if it’s a case like this, in the afternoon.

JOHN LAKE, MD: Uh-huh. But you don’t use a CPM.

EDWARD J. McPHERSON, MD: I don’t. I don’t. Does that mean I exclusive? No, I mean, if there’s—there’s obviously exceptions to that case, but my general philosophy is not to use a CPM.

JOHN LAKE, MD: What about thromboembolic prophylaxis? What do you do there?
EDWARD J. McPHERSON, MD: I use—I’m a mechanical person. I strongly believe in early mobilization, which is getting them up, at least sitting and standing, the first day, walking them early, using foot compression devices, TED hose, and some aspirin. Again, aspirin is not the main issue in the prophylaxis; it’s the early mobilization, compression stockings, and getting them moving. What about you, John? I mean—

JOHN LAKE, MD: Well, I used to be a Coumadin user almost exclusively and now I’m using low molecular weight Heparin for three weeks.

EDWARD J. McPHERSON, MD: I have been very tainted with what I call “Coumadin casualties.” What happens is these patients, even though the chest physicians believe that Coumadin should be used, they go out into the community, their PTs aren’t closely checked, for whatever reason, they get too elevated, and they get a big hematoma, they drain, they get infected. And I cannot tell you that—I can tell you that that is not a small event. That is not negligible. And I have a whole handful of what I would describe as Coumadin casualties.

JOHN LAKE, MD: Well, I agree with that. That has been a hard task for us, and we finally got around that by giving the pharmacists the ability to manage the Coumadin dose based upon the INR, and once our—at our hospital, our use of Coumadin anticoagulants went way up once we gave the orthopedic surgeon the ability to write down anticoagulate with Coumadin and keep an INR of about 2 for 3 weeks. And it—it sure made a difference at our hospital.

EDWARD J. McPHERSON, MD: The other thing I’ll say, too, is, you know, obviously nothing’s absolute. Now, we have a very strong internal medicine team here: I’ve got Dr. Rothbar and Dr. Brown, and obviously people when they’re fit and they’re on Coumadin, a patient with [indecipherable] is on Coumadin, obviously you’ve got to use it, and I will. There are other patients that are higher risk for thromboembolic disease. You know, if they have a lupus anticoagulant or they have antithrombin III deficiencies and prior DBTs and prior PEs, of course we’re going to use all that other stuff. But in the majority of situations, if you can get a primary knee up and walking the day of the surgery, their risks of thromboembolic events are definitely less. And I’ve been surprised at how they do. I’ve been using that protocol my whole career, you know, 13 years. So I would say I’m not absolute with the mechanical devices, but I would say I like to use it when possible. That’s my take. Again, another way to skin a cat. I will go to 2-0 down here. Do you use low molecular weight all the time?
JOHN LAKE, MD: I generally do. I do it for about three weeks, and I’ve found that it’s about the same cost of Coumadin because while Coumadin’s a lot cheaper, you have to do all the laboratory studies, and I find that it’s just sort of automatic and it works pretty well for me. So I’ve been doing that pretty exclusively.

EDWARD J. McPHERSON, MD: I would say going back to that hinge case, you ever done a hinge, John?

JOHN LAKE, MD: No.

EDWARD J. McPHERSON, MD: I would say that the message I want to leave here today. You know, I talk about hinges, but I would say in the majority of the community situations where revision knees are required, nobody is going to have to use a hinge, and I think that the SSK that we showed today: very versatile, you can use the augmentations on the tibia or the femur, you can use the stems, you can use the high post, which I think can really lessen the use of any hinge device. And I think this is a really good, versatile weapon in anybody’s hands.

JOHN LAKE, MD: Well, I think you took a very difficult situation and a very difficult operation and you made it look awful easy.

EDWARD J. McPHERSON, MD: Well, I tell you, the approach was the most concerning for me. Actually, with her small bone stature and her small size being 5-foot, you know, I really could have gotten in some big trouble today. I’m still not out of trouble yet. I’ve got to get her healed, I’ve got to get her moving. I promised to get her 120 at a year so that you guys invite me back, I can get a videotape to show her. So I still got my work cut out for us. I’m definitely going to be a slave driver and beat her and make sure that she gets this knee moving.

JOHN LAKE, MD: Well, that’s going to be important because she didn’t get it moving the first time, and so that will be real important.

EDWARD J. McPHERSON, MD: And kind of the message you’ve got to leave with these patients is tell them it’s not their fault. You know, they’re doing the best they can, so you got to coax them along and tell them, “Hey, everything’s going to be okay.” It’s a lot of—in revisions, there’s a lot of counseling involved along the way as well, as you well know.

JOHN LAKE, MD: So you’ve got one layer of blue stitches there and that’s probably a nonabsorbable suture, and now you’re getting into the subcutaneous tissue. And then what are you going to close the skin with?

EDWARD J. McPHERSON, MD: I’m going to close with monochrome. I’m a big cosmetic guy. I like nice, clean incisions; I don’t like staples. My patients like cosmetic closures, so that’s what I’m going to do, and I think it’s worth the extra time to do it.

JOHN LAKE, MD: I agree. I do pretty much the same thing, although I use prolene and I tend to pull it out—

EDWARD J. McPHERSON, MD: Yeah, I think that’s a beautiful technique as well. Either one of those will be fine.
JOHN LAKE, MD: And then what do you put on for dressings? And do you—do you use a TED stocking or an ACE bandage, or what do you do?

EDWARD J. McPHERSON, MD: Yep, that’s what I’m going to do. I’m going to put a xeroform on top, and I’m going to put some 4x4’s and AVD’s, and I’m going to put on a compression stocking and foot pumps. She’s going to get foot pumps right here at the end, and if she goes into the recovery room, the foot pumps will be activated and she’ll be going.

JOHN LAKE, MD: Well, the foot pumps is another thing that has to do with thromboembolic prophylaxis, right?

EDWARD J. McPHERSON, MD: I agree, yes. And that’s what—again, that’s the mechanical issue of prophylaxis. Again, everybody says aspirin. Aspirin is not the primary issue. It does help in the system. It’s the whole program: early mobilization—number one—early mobilization, pumps while you’re at rest, compression stockings so you don’t get too much swelling—this is the last little bit I’ve got to get up here.

JOHN LAKE, MD: Well, I think we can start to wrap it up. And we want to thank you and thank your team. You did an excellent job. You took a difficult situation that can sometimes be unpredictable and fought with problems and made it look simple, and we thank you. And we want to thank our viewers who watched this and went through it. And I think with that we can kind of wrap it up here.

EDWARD J. McPHERSON, MD: John, I wanted to thank you again for coming up. I know that you have a very busy, successful practice down in San Diego. I just want to tell you a little bit here, and we’ll finish this. And what I’m going to do is if I can close the edges here just a little bit I will. I’m going to put a drain in this area as well. I’ll bring her in extension, put the dressings on. But I’m going to get her going tomorrow. And again, 95 degrees, no sutures are popping, so I know that the therapist can push her right away to—in therapy. And I won’t have any specific criteria of discharge range of motion because I know with the Vanguard system they are a high-flex design, they’re very easy on the patella. So as soon as she’s up and moving, I feel that patients are safer at home with less [inaudible] risk for infection than they are sitting in a hospital getting rehab.

JOHN LAKE, MD: How long do you expect she’ll be in the hospital?

EDWARD J. McPHERSON, MD: I’m going to try to get her out this weekend, maybe Saturday. Today’s Wednesday, so I think Saturday’s a pretty reasonable goal for her. She lives nearby. So again, I’d like to thank the team, I’d like to thank John Vorbluski up top, and Dr. Lake, again, thank you so much. If there’s any questions, write them in; I’ll answer them. And again, if you guys want I will videotape her and show her walking later on down the road because I promised it, and then we’ll get this in motion.

ANNOUNCER: This has been a live webcast featuring Biomed’s Vanguard SSK revision knee system. From California Hospital Medical Center in Los Angeles,
California. For more information, to make a referral, or an appointment, click the buttons on your screen.

01:51:52

[END OF BROADCAST]