BAHA: BONE ANCHORED HEARING TREATMENT PROCEDURE
HARTFORD HOSPITAL
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ANNOUNCER: During the next hour, surgeons will perform the Baha system procedure to treat single-sided deafness, live from Hartford Hospital in Hartford, Connecticut. Ear, nose and throat specialist Dr. Marc Eisen will perform the surgery. Once successfully implanted, the Baha device will allow sound to travel through bone and restore close-to-normal hearing for the patient. During the webcast you may email questions to the surgeon by clicking the MDirectAccess button at any time. This program represents Hartford Hospital's ongoing efforts to bring the latest developments in healthcare to the community. And now we go to the operating room, where the surgery is already in progress.
00:00:57
GREGORY S. BONAIUTO, MD: Greetings, and welcome to today's live webcast. Over the next hour, we will demonstrate a Baha surgery for single-sided deafness, live from Hartford Hospital in Hartford, Connecticut. I'm Dr. Gregory Bonaiuto. I'm your host for the program. Next to me is Dr. Susan Meissner, who is an audiologist practicing at Hartford Hospital. I'm joined in the OR by Dr. Marc Eisen, who will be performing the surgery. Before we go to Dr. Eisen, I have just a few reminders for our audience. First, we will answer your email questions later in the program. To send us your question now or at any time during the program, just click the MDirectAccess button on your webcast screen. We welcome all questions and we'll try to answer all of them. Also, an archive of this program will be available through this website shortly after the webcast, should you wish to share it with a friend or family member. Finally, CME is available to physicians for participating in this webcast. To receive CME credit, just click the CME button at the conclusion at the webcast and complete the post-evaluation. Now let me turn things over to Dr. Eisen, who is performing the surgery. Dr. Eisen?
00:02:03
MARC D. EISEN, MD: Thanks, Greg. Before I get into what we're going to talk about and show today, I just wanted to introduce first myself, Marc Eisen. And thanks for joining in at Hartford Hospital today. I want to introduce the rest of my team. I'm going to -- across from me is Kal Embry. She's my scrub tech, for which I could do none of this without here. Dr. Palido is our anesthesiologist at the foot at the table. And we have two circulating nurses that are helping out today. Behind me you see Dmitri and Yasha. That is our team that's working today. So now let me first tell you about the patient today. This is Jessica, who is in her thirties. And as a 5-year-old child she was involved in a motor vehicle accident where we, among other injuries, lost her hearing on the right side. And she has lived the last nearly 30 years without having any hearing on the right and normal hearing on the left. And as we get on with the program, you'll see what challenges that creates for her. But the bottom line is, what we're offering today is the Baha system. And I'm going to first have my audiologist, who is Sue Meissner, she's going to talk to you about what the implication of single-sided deafness is and the challenges that it creates. Then we'll take you through the surgery. We'll show you what we're going to show you first, in a slide presentation, and then we'll cut back to the surgery itself and I'll take you through a live demonstration on

Jessica of what we're doing today. So why don't we start off by going to Sue Meissner, our audiologist, and have her talk to you about single-sided deafness and its implications. So Sue, can we go to you?
00:04:03
SUSAN M. MEISSNER, AuD: Yes. Thank you, Dr. Eisen. I want to start by just defining single-sided deafness. It's a condition where there is normal or near-normal hearing in one ear and no functional hearing on the other side. There are several causes for this condition. It can be a congenital unilateral hearing loss or, as in Jessica's case, there can be a traumatic injury following an acoustic neuroma surgery that can leave a patient with no functional hearing on one side. And there are cases with sudden onset hearing loss with no known cause. In cases where there is deafness on one side, a conventional hearing aid would not be of benefit because there's no sufficient remaining hearing to tap into that would be usable. Single-sided deafness has been underestimated in the impact on a patient for many years because the assumption has been that when there's normal hearing or near-normal hearing in one ear, then obviously hearing is still present. However, in real life day-to-day conditions, there can be a significant impairment with single-sided deafness. First of all, your hearing is limited to that one good side. If someone's on the opposite side of you, then your hearing is significantly hindered. Localization of sounds requires the two ears working together. Now, that can be both a safety issue in terms of knowing where some hazard is coming from, but it also can occur in day-to-day situations, both socially or in a work situation, for example, a meeting where you may need to attend to many different speakers that may change from one to another in rapid succession. And without being able to localize where the sound is coming from, that can be a real challenge. Listening to speech in a noisy environment is also significantly impaired because hearing in a group or in a noisy environment requires hearing in stereo. The end result is hearing that is very unreliable and unpredictable, where one minute you may be hearing very well because the sound is being presented to the normal side, but a few minutes later hearing can be a very significant challenge and you may not be able to hear successfully because the conditions may have suddenly changed, the person may have moved from the good side to the other side of you where you're not able to hear as well, or background noise may suddenly start up and then be an interference.
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One of the problems with single-sided deafness is the head is in the middle, which can block the sound getting from the ear -- or the side with functional hearing from -- the sound getting from the poorer side into the normal hearing side. That is called the head shadow from that blockage. Particularly affected are the high-frequency sounds which are contributing to word understanding and clarity. So there may be cases where a person hears that someone is talking or speaking but still not have successful communication because they did not get the words clearly enough to respond appropriately. The way the device works is it uses the fact that sound is transmitted very efficiently through the head using bone conduction. The Baha device uses sound vibrations, and those vibrations then are passed from the side with no functional hearing to the functioning ear internally on the opposite side. That happens very efficiently, with no loss of energy, because the placement of the device is surgically implanted. The sound quality is very high-quality and it exceeds results that you can get with many conventional hearing devices because in this case the ear with functional hearing, the hearing is completely normal. And so this is able to, once that sound is getting to that side, the sound will therefore be very, very natural because it's an unimpaired ear that we're using.
00:08:15
The Baha system consists of a bone-anchored titanium fixture that is implanted in the mastoid bone, or behind the ear. The device has a microphone that picks up the sound, a processor, which is a computer inside the hearing aid which is correcting for the sound for the highest quality. And then that is then changed from a normal soundwave into a bone

conduction vibration, and that is what is passed then through the abutment so the sound can then travel through the head to the functional cochlea, or inner ear. Let me show you what that device looks like. On your screen you will see the placement of the abutment behind the ear, and that's the portion that's protruding. And then the external device then clips onto that securely. In most cases the hair can then cover that up so that it is a cosmetically appealing choice for most individuals. Let me show you that device that I have here. You can see in front of me the abutment. Because of the way that the surgery is done, this is actually somewhat recessed, and so it does not protrude as much as you may see here. The device then attaches to that securely. And you can see just from reference here that that's quite small. So that rests there. And that consists, again, of the microphone, a volume control, and as the audiologist, I can also address the sound quality for maximum comfort and clarity.

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The Baha device is very effective for this single-sided deafness condition because then someone has a microphone that is placed on the non-functioning side so that when someone is on that side, now they have the ability to hear and be aware of those sounds, both for safety and communication purposes. It allows for localization and improved hearing and noise. This device also lacks some of the disadvantages of more conventional treatments for that. It used to be that you would use a CROS-type hearing device, which stands for contralateral routing of the signal, where there would be two external devices with a microphone and an amplifier and then the sound would be transmitted to the better side. The problem with that type of a device is that the sounds would be then introduced into the better hearing side with an occluding earpiece and the sound quality was less natural. Another alternative was a bone conduction device, but because the placement of the bone oscillator is superficial on the skin, the transference of that energy is less efficient, and therefore the sound quality is poorer, less natural. And last, that device was uncomfortable because you needed to have a significant amount of pressure for those sound vibrations to come into the ear, whereas the placement of the Baha, that transference of those sound vibrations is very efficient because it's directly into the bone itself. I'm going to now turn things over to Dr. Bonaiuto to talk about the surgery itself.

00:11:38

GREGORY S. BONAIUTO, MD: Thank you, Dr. Meissner. I'd like to give you a brief overview of the actual procedure that Dr. Eisen is performing behind us right now. He can take you through, again, some of the details as it is live. And my goal would be, by reviewing some slides, to show you what we're doing, give you an anticipation of what you might see. The first step, which you'll see before you on the slides, is to mark the location in the skin where the screwlike fixture will be anchored. Subsequent to that, the region is shaved of hair and the side is marked with a surgical pen. Next slide, please. The next series of slides demonstrates the elevation of a skin flap. And the purpose of this is to provide access beneath the skin to allow removal of some of the soft tissue where the screwlike fixture will be anchored. The skin is preserved so that it can be used to cover over the site at the conclusion of the case. Next slide, please. This next series of slides demonstrates the removal of the tissue beneath the skin flap. You can see in the first slide that the skin is reflected out of the way and preserved and left attached along the top of the screen, acting as a hinge. Beneath that the soft tissue consisting of fat and some muscle is removed. And let me take you to the next series of slides, please. In addition to removal of the skin immediately in that square, the tissue is further undermined, and this promotes healing at the end of the case. So this is a series of slides showing that undermining. The next series, please. These two slides demonstrate the fact that once the soft tissues are removed, Dr. Eisen has to locate the center to place the screwlike fixture. And the next slides, please. The next step includes a slide not shown here, where a small pilot hole is drilled into the bone and a small drill is used to place the screwlike fixture. Next slide, please. The next step requires placement of the skin flap over the fixture. This is done by creating a small hole in

the skin flap and stretching it over the implant fixture. Next slide, please. This final series of slides shows the suturing of the skin back to position and placement of a surgical dressing over the site. And one additional slide, please. The site needs to be cared for long-term with a soft brush. This looks very much like a toothbrush, and indeed, a toothbrush can be used for this purpose. One more slide. This slide serves to demonstrate that there is care needed for the surgical wound postoperatively. And that occurs obviously in the first few days and weeks. The healing occurs from weeks to months. And once the screwlike fixture is permanently in place and well-healed, the device can be utilized. That actually takes about three to four months, and this slide is good at describing that. I would like to turn this over now to Dr. Eisen, who is in the midst of the surgery. Dr. Eisen?
00:15:47
MARC D. EISEN, MD: Thanks, Greg. Okay, so what I want to do now, now I can show you what I've done so far and how the procedure usually goes. And the first step, it's going to be very similar to what you just saw on the slides. The first step, again, just to orient you, we have the right ear, which you see here. And the area behind the ear has been removed of hair, I shaved the hair, and you see has been prepared in the usual sterile fashion. The way I start, and what I am not showing today, but I'll show you what I did do, is place the mock device behind just to orient as far as distance behind the ear that you want to place the fixture and abutment. After I did that, I placed a mark, which is in purple that I think you might be able to see, in the middle. And that's the goal location of the fixture placement at the end. And then as you saw on the slides, we raise the skin up, a very thin layer of skin, and that you can see here. I made the incision around three-quarters of the perimeter and then raised the skin up. And I'm just holding it back with some retractors. Next what I did is incised some of the soft tissue. The most important part of this surgery, I think, is to remove enough soft tissue such that the skin will lie flat against the skull. So the way we do the tissue removal I'm showing you here is I've made an incision kind of around the perimeter. And I'll take out the tissue that I've removed. You can see one piece there, a second piece, and a third piece. And the important thing to notice is that I've extended the soft tissue removal beyond the border of the skin flap, and that's an important part of the surgery. At this point what I want to do is show you how we remove a little bit of what we call the periosteum, which is the soft tissue that is directly adherent to the bone of the skull. Again, we have our mark in the center, which is the goal of where we're going to place the fixture. In order to do that, we have to remove some soft tissue around that area. So what I'm going to do is take the 15 blade and I'm going to incise an area about a centimeter square of the periosteum. And then we're going to remove that periosteum with the small elevator. And again, we're removing all the way down to bone. And now you're starting to see bone beneath with no soft tissue. And something I notice sometimes is that the skull is not perfectly flat and there's areas of undulation that are not the best areas to place the fixture. So what I'm going to do is clear away some of the soft tissue and move where I thought I was going to place the device to a little bit higher. And I'll take a marking pen next. We're going to place our goal here. And then just remove a little more periosteum. And now you can see the bone is ready for the next step of the procedure, which is going to be drilling a pilot hole. We're going to irrigate the bone at the same time as we're drilling.
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Now, what you can see here is that we have a little stick that is an orientation rod stuck onto our drill. This is useful for orienting your pilot hole such that it's straight up and down, essentially perpendicular from the surface of the skull. And we're going to start the drill running. I'm going to have Kal irrigate. Keep irrigating. We're going to punch in and out. It's important that we don't heat the bone up too much. And you can see I'm kind of moving in and out. And once I see that it looks like I'll be able to go the full 4 millimeters, I pop off a little cap and continue drilling my pilot hole, again, making sure I'm straight up and down. And once we're done with the pilot hole, the next step is to change the drill from the pilot to a countersink. Again, I kind of look in several planes to make sure I'm perpendicular. And

Kal's going to irrigate vigorously. All right. And what we want to do is make our countersink a little bit countersunk, just enough -- could I irrigate here? And I'm not sure if you can appreciate it or not, but there's a little bit of countersinking to the pilot hole that we've drilled. And now the next step, we're ready to just make sure our soft tissue looks -- a sufficient amount of soft tissue has been removed. I'll take my change to the -- great. I'm going to grab the titanium implant. And what I want you to notice is that we changed the speed of the drill now to very slow. And I'm going to have Kal get ready to irrigate once I grab the bone. Make sure that you can see this. Start the drill running. And here we have the tapping of the titanium screw. Kal, you can start irrigating. What is our setting? Can you put it on 31, please? 31. 32 is fine?
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GREGORY S. BONAIUTO, MD: We've received --
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MARC D. EISEN, MD: Great.
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GREGORY S. BONAIUTO, MD: We've received numerous questions emailed to us. The first question came in --
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MARC D. EISEN, MD: Greg, just before you go to the questions, I just want to point out now that we have our titanium fixture that's been placed into the bone, and it looks like it's seated well. And what we have to do -- you can see -- maybe you can see in closeup -- that this is the abutment and the fixture. And the fixture's now in good position. So now we have to do a little bit more soft tissue work. I'm going to -- Greg, I'm going to let you go to some questions. This is a good time for that.
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GREGORY S. BONAIUTO, MD: The first question is, has this procedure been done on children? And the response is that the FDA has approved this device for children 5 and --
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MARC D. EISEN, MD: [Unintelligible] container. Five and above, yes.
00:26:38
GREGORY S. BONAIUTO, MD: Received another question. "In the 1990s, I had surgery to remove a glomus jugulare tumor on my left side and I have no hearing on my left side. Am I a candidate for the Baha?" Obviously if the audiologic requirements have been met, the surgery also requires, as you're seeing with Dr. Eisen operating today, firm bone in the vicinity where the implant will be placed. So it depends a bit on the approach to the tumor and whether there's bone in that vicinity to allow the implant to be placed. But I don't think there's any specific contraindication based on what you've described in this email question.
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MARC D. EISEN, MD: Perhaps, Dr. Meissner, if you'd like to address any of these.
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SUSAN M. MEISSNER, AuD: Yes. A question has come in if there are any other conditions besides single-sided deafness where the Baha device would be indicated. And the answer is yes. This is indicated anytime there would be a conductive hearing loss which was not able to be corrected by other types of surgical procedures because as long as there is functional hearing or functional sensory abilities in the ear to tap into, the device would be appropriate. It's particularly helpful in cases where there's a draining ear. A conventional hearing aid could not be used in those cases because of the discharge from the ear and the health considerations. It can be used when there is a mixed hearing loss as long as the bone conduction thresholds, which is the test of the sensory ability of the inner ear, was still sufficient, which would be defined as approximately 45 decibels or less. So the critical factors there is how the inner ear is functioning and whether or not there's sufficient function for the Baha device to tap into for good results. So single-sided deafness, some cases of conductive hearing loss, or mixed hearing loss, particularly conductive hearing loss

with draining ears would be conditions for which the Baha device would be appropriate. Have we received any other questions?
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GREGORY S. BONAIUTO, MD: Dr. Eisen, there's a question I could ask you.
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MARC D. EISEN, MD: Sure.
00:29:13
GREGORY S. BONAIUTO, MD: One patient writes in that they have a history of a previous tumor resection, brain tumor resection, and as a result of that, the bone deficit was closed with titanium mesh. Can you address whether this is appropriate in those patients?
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MARC D. EISEN, MD: Yes, frequently -- this is probably acoustic neuroma surgery. And the titanium mesh that's used as part of the reconstruction is close to but not in the way of having the Baha system surgery. In fact, it's a really good indication because these patients usually have near-normal hearing on the opposite side, similar to the way Jessica does, and they benefit from having this procedure done and having the Baha. So, no, it's not at all a contraindication. In fact, it's a frequent indication. And we have to sometimes work around titanium, but that does not create too much of a problem.
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GREGORY S. BONAIUTO, MD: Let's see if there are any others that have come in. Actually, we've received many, and hopefully we can get to all of them.
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MARC D. EISEN, MD: I think what I'll do now, as you're getting ready to go to the next question, is I'm going to show you how we make room in the skin for the abutment. I'm at that point in the procedure. So what we do is mark out the site and then take a -- you can see here's the skin flap. And we mark the site. And we have a little punch. And you can see we take a little bit of skin. I'll take the Adson's forceps. And a 15 blade. Just removing that little small piece of skin. And you can see how that's going to fit nicely over the abutment. And at this point all we have left to do is close up and close our incisions that we've made. I'm happy with the amount of soft tissue that's been removed. You can see as we push down that it's going to form a nice kind of slowly sloping ramp rather than a sudden dropoff in the profile of the tissue. So I'm just going to start to close up. The 3-0 chromic suture.
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GREGORY S. BONAIUTO, MD: All right, Marc. Perhaps we could go back to some more questions as you do that.
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MARC D. EISEN, MD: That would be fine. If you want to watch me sew while you're answering questions, I think that'd be great.
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GREGORY S. BONAIUTO, MD: Next question: is this procedure covered by insurance? My understanding is that it is approved by Medicare and there are some insurance carriers that are covering it. And coverage is improving as time goes on, and some of the benefits of this are being seen. Dr. Meisser, is there anything you can address here?
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SUSAN M. MEISSNER, AuD: Yes. We received a question on how the Baha differs from a cochlear implant. They are used in completely different circumstance although they both are implanted devices. I've already described the conditions for which the Baha is indicated. A cochlear implant involves the implantation of an electrode array into the cochlea, and then there is an external device which is the processor. That device is indicated in cases of severe to profound sensorineural hearing loss on both sides and basically is indicated to restore functional hearing sensitivity to a patient who has very, very limited hearing abilities. So they are two different caseloads for when this would be indicated, the Baha being for single-sided deafness or conductive hearing loss or mixed hearing loss, and a cochlear

implant being indicated for children or adults with severe to profound sensory impairment for which a conventional hearing device would no longer be sufficient to provide adequate functional hearing for communication purposes.
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MARC D. EISEN, MD: Sue, that's an important point that gets confusing. We think a lot about how we treat patients with hearing loss, and to us it's easy to remember the difference between the cochlear implant and the Baha, but they really are two totally different mechanisms and have two totally different implications, and it's important to remember that. Jessica has normal hearing on one side and no hearing on the bad side, and that's very different from the patient that needs a cochlear implant. What I can do -- in fact, what we haven't talked about is how the patients get tested to determine the candidacy and determining if the patient is a candidate at all for any of this technology. So what I'm going to have next is, Sue, I think I'm going to have you take us through the process of determining who is a good candidate for the Baha for single-sided deafness. And one thing that when you start talking about it you can show is the video of how we have Jessica go into the sound booth and the day that she came in to see if she's a candidate or not. So why don't I have you take that away.
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SUSAN M. MEISSNER, AuD: Sure. The first thing we do when a patient comes in is I take the case history and find out whether or not it sounds like their history would be indicating candidacy for the Baha. Many times patients call and are asking about that because they've heard that we have that program. So first time we start with the case history and then do the testing. Now, the testing itself is conducted in an audiologic sound booth and consists of speech testing, both to determine the thresholds, or point of detection for speech, their ability to hear words with good clarity and understanding, looking for any distortion that may be present in the auditory system, and also responses to pure tones, which would test their hearing throughout the hearing range from low, mid and high frequencies. Again, testing for threshold or point of detection for those sounds in each ear. In the clip that you're about to see, you will see in Jessica's case that first we needed to establish that she did have a normal or near-normal functioning ear. We also needed to document that the hearing in the impaired ear was indeed nonfunctional. You will see here responding at times and at other times being hesitant or failing to respond, and that's as the hearing levels dropped to that threshold point. And we can go ahead and show that video clip.
00:36:24
[video plays]
SUSAN M. MEISSNER, AuD: -- bring you into the sound room.
JESSICA FETT: Okay.
00:36:25
SUSAN M. MEISSNER, AuD: There is a step up, so watch your step up, and you can sit in the seat right in front. Okay. I'll be saying some words. Please repeat these words back to me. Say "sidewalk."
00:36:51
JESSICA FETT: Sidewalk.
00:36:52
SUSAN M. MEISSNER, AuD: Airplane.
JESSICA FETT: Airplane.
00:36:54
SUSAN M. MEISSNER, AuD: Cupcake.
JESSICA FETT: Cupcake.
00:36:56
SUSAN M. MEISSNER, AuD: Outside. Headlight. Mushroom.
00:37:02
JESSICA FETT: Mushroom.

SUSAN M. MEISSNER, AuD: Birthday.
00:37:04
JESSICA FETT: Perfume.
SUSAN M. MEISSNER, AuD: Oatmeal.
00:37:20
SUSAN M. MEISSNER, AuD: I'll be testing the ear without hearing, so don't get frustrated. Say "sidewalk." Oatmeal. Earthquake. Railroad. Hardware. Cowboy.
[video ends]
00:37:49
SUSAN M. MEISSNER, AuD: I'm holding a mock Baha device, and this can be used for demonstration purposes in the office. At the conclusion of the testing with Jessica, I knew that she was a good candidate for the device, so I wanted to give her an experience that would show her on a very really level for her just how much benefit would be available to her. So the device was placed behind her ear on the bone on the impaired side. This has a microphone inside. And then the volume was increased until she indicated that she was receiving the sound comfortably. For her I also placed an earplug on the ear that had normal hearing because that's always been a situation where she would know that she would definitely not be hearing anything. And yet because the Baha device had been activated, she was still able to hear me and respond normally, and the sound quality she could hear was very natural-sounding and very clear and comfortable. At that point, Jessica became very excited, and that's a very common experience when someone gets a chance to hear what the device can do. So this really allows patients to have the unusual experience of trying a device before they really are committed to do it, and it really lets them know the level of benefit that is available. At this point we can also see if there's any additional questions that have come in.
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MARC D. EISEN, MD: Sue, I think I'm going to come back over and give you an update of how I'm just finishing up. But something else I want to emphasize that's important is -- again, I'm just kind of sewing around the perimeter. Again, just sewing around the perimeter, making sure that the soft tissue is now -- the incision is closed. And we also tack down the soft tissue a little to the, what we call the periosteum beneath. But as far as determining candidacy, I think it's important not only to think about who's a candidate but what we're doing. Because we're not, again, giving any hearing to the bad ear. Jessica's right ear will never hear again. And what we're -- again, it's just important to remember that we're efficiently going to be able to get the sound from the right side to the left side and in that way give her -- help her get over the challenges that single-sided deafness presents. But important to remember that she will not hear in the right ear. She will hear from the right side, but not from the right ear. And sometimes that's a little hard to remember, but I just wanted to emphasize that point, Sue, before you go on and maybe take the next question.
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GREGORY S. BONAIUTO, MD: Well, there are a couple questions that seem to relate to what level of activity the patient can expect to return to after this, regarding sports, swimming, risk of infection, and those kinds of things, Marc, and I was wondering if perhaps you could address that. Can patients swim after this is placed?
00:41:11
MARC D. EISEN, MD: They can. Now, you have to remember that -- if you can come to me, I'll show -- I'll just focus on the abutment again, if you can look over my shoulder. And so this is the abutment. This is the permanent part, well, it's actually semi-permanent. You could remove the abutment, this part, if you needed to, but you don't. So the patient has the abutment on 24 hours a day, 7 days a week. But the hearing device itself is -- in three months, Jessica will get that, and that's the vibration device that rests on the abutment. And when you would go swimming, you would take -- as Sue showed, you would take off

the device itself and put it someplace dry. Can I just have the scissors? But certainly you could go swimming as long as you take the hearing device part off. And likewise, for some of the contact sports, you can wear a helmet, and if the helmet fits over the device, you could potentially wear it, but I probably will recommend for people who are doing contact sports to consider taking the device off and leaving the abutment free during their contact sport activity.
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GREGORY S. BONAIUTO, MD: And this, Marc, all applies to after this initial healing phase of several months.
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MARC D. EISEN, MD: Yeah, that's another important thing that you probably saw in the slide show but I'll emphasize again, which is now that we've finished the procedure, Jessica has to wait about three months, not for the soft tissue but rather the bone itself and the integration of the titanium into the bone. That integration takes place over the course of the next couple months, and we want to make sure that as the titanium is integrated into the bone it's a solid connection, and time does that. So the healing process is mainly dictated by the integration of the titanium. And that can be frustrating for patients, but as long as they know that in three months they'll be getting their device, I think they can rest assured that the time will pass quickly, as it always does. 00:43:16
GREGORY S. BONAIUTO, MD: There's a question here from a patient, a potential patient, who asks whether the fixture can accommodate the ever-shrinking technology in today's world. Obviously if the device becomes smaller down the road, I'm assuming that would be able to fit the fixture that's already been placed and not have to have a new fixture. Is that your general impression?
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MARC D. EISEN, MD: That's a good point too, because technology is always changing. And technology even with the Baha system has changed recently. It's always getting more powerful, smaller, more sophisticated, just like computers. The good news is that the abutment stays and the device can change. So you can get an updated processor when they become available. And the cochlear corporation has been good about helping patients do that. But again, they make sure that the abutment is compatible so you don't have to change it.
00:44:17
GREGORY S. BONAIUTO, MD: I have a question here about single-sided hearing loss and associated ringing in the ear. And the question is would this device address the ringing as well as the hearing problem. I think I'm going to let Sue take that one because she has experience with how hearing aids in general affect tinnitus. Tinnitus is, again, that sensation of sound even though there is no sound. It tends to be ringing but can have character of roaring or pulsatile. But tinnitus is a tough thing, and Sue, do you want to talk about your experience with hearing aids and how people respond with their tinnitus?
00:44:54
SUSAN M. MEISSNER, AuD: Hearing aids or the Baha is not a direct treatment for tinnitus. It is a device to facilitate communication and address a specific hearing problem. Tinnitus can be a very, very difficult issue to deal with because it does affect people differently. One of the things that I hear all the time is that tinnitus is much more noticeable in quiet environments. And when you're going to sleep, when you're just sitting and reading, but that tinnitus is very, very noticeable. Any hearing correction, whether it be conventional hearing aid or the Baha system, provides a more natural sound environment. And my experience has been that when natural sounds are available, then it's easier for the individual to not be as acutely aware of their head noise or tinnitus. But it would not be reasonable to say that this is a treatment for tinnitus. However, the providing of a more natural sound environment in many cases can be helpful to the patient in reducing the annoying effects of that tinnitus.

00:45:59
GREGORY S. BONAIUTO, MD: But its primary thrust is not to address tinnitus in a patient.
00:46:04
SUSAN M. MEISSNER, AuD: This is relating to improving communication by improved hearing.
00:46:07
GREGORY S. BONAIUTO, MD: Right.
00:46:08
SUSAN M. MEISSNER, AuD: Any benefits to tinnitus would be just secondary and a bonus.
00:46:13
MARC D. EISEN, MD: Thanks, Sue. I think I'm going to -- just before you guys go on to the next question, I'm going to show which I think is important. Since we've met Jessica, I think we might have some more video of Jessica's story. I think she has a very nice story. And if we can take a look at what else we have to show you, you can get to know Jessica a little bit better.
00:46:40
[video plays]
ANNOUNCER: After sustaining a traumatic head injury in a car accident at age five, Jessica Fett's parents noticed she had lost the hearing in her right ear.
00:46:49
JESSICA FETT: I was on the phone with my dad one time, and he had my mom put the phone on my right ear because he thought I was deaf, and I couldn't hear anything. I kept saying, "Dad, where are you? Dad, I'm here." And that's when we found out that I was deaf.
00:47:05
ANNOUNCER: Doctors diagnosed Jessica with a condition called single-sided deafness. As a result of her condition, Jessica is unable to determine the direction of sound and has difficulty hearing in noisy environments.
00:47:17
JESSICA FETT: And even the simple things, like driving in the car with my kids, they're all in the back. I can't, you know. And the window's right here, so no matter how quiet your car is inside, you still get some noise from outside. And then the kids are in the back and I can't really hear them.
00:47:35
ANNOUNCER: Unhappy with conventional hearing aids, Jessica consulted with specialists at Hartford Hospital in Hartford, Connecticut. Her doctor recommended the innovative Baha hearing treatment system.
00:47:46
MARC D. EISEN, MD: One other true advantage of the Baha system is that we're not operating on the ear itself, so there really is no risk of further hearing loss with the procedure. And all of the surgery is done to place the device behind the ear. And in cases, again, where the middle ear would need to be manipulated in order to try to correct the problem, we're really bypassing the middle ear and any problems associated with it. And again, that's a true advantage, taking away that risk of nerve damage.
00:48:13
ANNOUNCER: The Baha system channels sound directly to the inner ear, bypassing the middle ear. For patients with single-sided deafness, the Baha system can restore close-to-normal hearing without invasive surgery to the middle ear.
00:48:28
JESSICA FETT: I think it's like somebody who has cataracts. You can't really see clear. And then you get your cataracts fixed, and you can see life so brilliant and so clear. All the colors are beautiful. At least that's what my grandma told me when she had her cataracts done. So I'm thinking that when I get this, everything will be just a little bit more crisper, everything will be clearer, and I'll be able to hear things that I didn't hear before.

[video ends]
00:48:52
MARC D. EISEN, MD: So Jessica has a very nice story, and I really think we're going to help her nicely today. I'm just going to show you how we close up. So now again the skin's been closed, and we have what we call -- this is a healing cap. Simply snaps on to the abutment. And then we wind a little gauze around, the whole idea being to protect the soft tissue underneath to make sure it heals adherent to the bone beneath. And then after I do this, I'm just going to place a dressing over the whole ear and the abutment. And Jessica's going to come back in a week and we'll change this gauze that I'm wrapping around. We'll do that again about a week later, and then Jessica has to take care of her abutment a little by just making sure it doesn't get crusts over the course of the next couple months. And then three months will come by and she'll come see Sue to be turned on essentially, to get her device placed on the abutment. So thanks again for tuning in today. Again, just in summary, we're showing the Baha system for single-sided deafness, which you've seen today. And I thank all the help I had today. And what I'll do next is I'm going to put a big dressing on and I'm going to have Dr. Bonaiuto just give his final goodbyes. Greg, do you want to lead us out?
00:50:27
GREGORY S. BONAIUTO, MD: Sure. This has been a surgical implantation of the Baha hearing treatment for single-sided deafness performed live from Hartford Hospital. I'm Dr. Gregory Bonaiuto. Dr. Marc Eisen performed the surgery. Thank you for joining us for what we hope was an informative webcast. On behalf of my colleagues and the operating room staff at Hartford Hospital, good night.
00:50:52
ANNOUNCER: This has been a demonstration of the Baha system surgery for the treatment of single-sided deafness. The surgery was performed by Dr. Marc Eisen, live from Hartford Hospital in Hartford, Connecticut. OR-Live makes it easy for you to learn more. Just click on the "request information" button on your webcast screen and open the door to informed medical care.
00:51:25
[end of webcast]