BREAST CANCER LUMPECTOMY AND SENTINEL LYMPH NODE BIOPSY
GENESIS MEDICAL CENTER
DAVENPORT, IOWA
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NARRATOR: Welcome to Genesis Medical Center in Davenport, Iowa. Over the next hour you will see the premier webcast of a breast cancer lumpectomy and subsequent sentinel lymph node biopsy. The procedure will be performed by Dr. David Aanestad, Dr. Joseph Lohmuller will moderate.
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A sentinel lymph node biopsy, sometimes called sentinel lymph node mapping, uses radioactive tracers and die to identify the sentinel nodes, the first nodes to receive breast cancer cells, which spread via the lymphatic channels.
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JOSEPH LOHMULLER, MD, FACS: Hello. My name is Dr. Joe Lohmuller. I'm one of the staff surgeons at the Center for Breast Health at Genesis Medical Center, Davenport. We're here today in the operating room at Genesis Medical Center, Davenport, East Rusholme Street Campus with myself as commentator and Dr. David Aanestad with his patient, who's recently found to have a breast mass.
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Dr. Aanestad's patient is fifty-five years old. She found a mass herself on checking her own breast and reported to her doctor that this had been located. And subsequently, her physician arranged for her to have a mammogram and a consultation with Dr. Aanestad. Dr. Aanestad saw the patient at the Center for Breast Health, and in concert with our radiology team there arranged for her to have special studies done to help determine the exact nature of the mass and, unfortunately, he found that it was a malignancy.
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Dr. Aanestad is here in the operating room today to perform the surgery, which will be the patient's first treatment for this cancer, in removing the cancer itself to determine the exact nature. And if necessary, if the cancer is a invasive cancer, to stage the cancer by removing a sentinel lymph node from under the patient's arm on the same side. So we're going to proceed with Dr. Aanestad demonstrating the injection of the material and explaining how he's going to go about this procedure, and talking a little bit about the procedure as he goes.
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So you can see that Dr. Aanestad followed the same patter of injection with the small needle marks that the radiologist had used. And this allows him to introduce the blue dye in a similar fashion to help identify the sentinel lymph node. And when one uses both the blue dye and the radioactive material, then you can see that we actually have two mechanisms to identify the sentinel lymph node.

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One could use either just radioactivity or just the blue dye. When you use both the find rates and detection rates for the sentinel lymph node are slightly higher, so we tend to use both here in our program.
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DAVID J. AANESTAD, MD: So, first of all, I'm going to approach the…the tumor itself. And I'm going to make a curvilinear incision in the upper breast here and dissect down through the breast tissue. And when I feel the tumor, I'm going to do a lumpectomy, which is going to involve removing the tumor and a margin of normal tissue around it.
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So we're going to start by just drawing a little line here. I'm going to plan my incision. And I usually make these in a…in a curve fashion to try and minimize scarring. There are some lines along the skin called Langer's lines and if you make your incision along those lines the scars will be less noticeable. Sometimes if you kind of mimic the curve of the edge of the nipple here, the areola, that's also a help. A little bit of local, please. We're going to inject some local anesthesia. This patient is asleep, but injection of local if…before you make an incision will potentially reduce the postoperative pain she has when she wakes up.
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JOSEPH LOHMULLER, MD, FACS: David?
DAVID J. AANESTAD, MD: Yeah.
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JOSEPH LOHMULLER, MD, FACS: You might mention a little bit about a your preoperative biopsy that you did to further delineate what exactly the mass consisted of so that people might understand exactly what it is you already know about this tumor, as you plan your operation.
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DAVID J. AANESTAD, MD: Well, again, this…this woman has a clinical picture is that is very suspicious for cancer. And when we see something like that, we want to do something to…to support or confirm the diagnosis of cancer, obviously, before we get to this point. So she had what's called a flying needle aspirate that was done by our radiologist, using image guidance. I can't remember now, I think they did it with ultrasound guidance.
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And, when they do that, they insert the needle into the tumor and use suction to aspirate some of the cells from the tumor. And they put those onto a slide and send those to the pathologist who then looks at them under a microscope. He can tell us whether they are suspicious for cancer or not suspicious. And then, we base our subsequent management on the findings of that biopsy.
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I've made my incision. You can see dissecting down into the parenchyma of the breast here. You can see…kind of see the fatty tissue of the breast peaking up through the incision. We'll put some retractors in here and that will help me to…to get to…to do the lumpectomy. Let me have a [Sen?] here first. Hold that up.
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JOSEPH LOHMULLER, MD, FACS: What did the needle biopsy in this patient show you before the surgery as you planned it?
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DAVID J. AANESTAD, MD: Well, here needle biopsy revealed malignant cells that the pathologist felt were consistent with infiltrating ductal cancer, which is the garden variety of breast cancer; the most common breast cancer that we encounter. So, that would certainly support the diagnosis of cancer. The FNA's are not perfect and so that's part of the reason we're doing this part of the operation first. We need to confirm with a hundred percent certainty that this is an invasive cancer in order to proceed with the…the rest of the surgery.
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JOSEPH LOHMULLER, MD, FACS: So, perhaps a noninvasive cancer might show some of these same cells. And in the noninvasive cancer we would not need to necessarily do a sentinel lymph node biopsy.
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DAVID J. AANESTAD, MD: Yeah, that's…that's correct. Now, again, the clinical picture is not very consistent with a noninvasive cancer. Most of the time a noninvasive cancer won't present as a mass; although, there are certainly exceptions to that rule. And most of the time that spiculated pattern that you see on a mammogram is going to be consistent with cancer and not pre-cancer.
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JOSEPH LOHMULLER, MD, FACS: As you are working inside the breast there and you are feeling around the tumor, can you actually feel the cancer itself compared to the normal breast tissue? And, is that what helps you decide where to cut, or is there some other method you use?
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DAVID J. AANESTAD, MD: Well, in this case she has a very easily palpable mass and I can feel the density. It's right in this area here. And so around that I can feel the…the fairly normal character to the breast tissue. If we have non-palpable masses, there are other ways to localize it.
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JOSEPH LOHMULLER, MD, FACS: How much normal tissue do you like to take out around the tumor to try to make sure that you have the entire cancer removed from the breast? Do you need to take a lot, or do you just need a little bit?
DAVID J. AANESTAD, MD: Well----
JOSEPH LOHMULLER, MD, FACS: Do you need to take a lot, or do you just need a little bit?
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DAVID J. AANESTAD, MD: You…you want to try and find a…a happy medium. There is some controversy about how much of a margin is enough. But in general, the larger the margin you can get the better. If it's less than a millimeter, that's probably too close. We consider that to be a positive margin most of the time. If you can get a centimeter, that makes us feel pretty good. But, it…it varies a little bit. But, certainly, we never want to cut through tumor. That would be a positive margin and that would be associated with an increased risk of local recurrent. Let me have that Debakey back, please.
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You can see all this dye can sometimes be a little bit prohibitive in…in seeing very well. It probably is…obscures the view of some of you people because it absorbs the light and makes it difficult to….to see. So I try to…using suction or a sponge to remove some of that and enhance my view.
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But the other part of lumpectomy that you have to consider is we don't want to affect the cosmesis of the breast too much if we can avoid it. We want to get a…or, obviously, our first and foremost priority is to get a negative margin, get…get a good cancer operation. But one of the…one of the benefits of breast preservation is…or, breast conservation is that you have a breast that's cosmetically acceptable. So, that's the other part you have to take into consideration. The size of the breast sometimes determines how much of a lumpectomy you can perform.
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So I'm, again, just sort of feeling the density with my fingertip and trying to work my way around it. That's, again, difficult probably for you to see down in that hole, but…
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JOSEPH LOHMULLER, MD, FACS: Now, this patient's chosen to have a lumpectomy and a sentinel lymph node biopsy. That must mean that she's also going to have radiation therapy to the remaining breast as part of that treatment, is that correct?

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DAVID J. AANESTAD, MD: That is correct. If you choose breast conservation, if that is an option for you, you are essentially choosing radiation. The radiation helps to treat and sort of sterilize the rest of the breast tissue. And it…If you didn't take radiation after this operation you'd have an unacceptably high rate of local recurrence. Meaning she's get a…she'd get the breast cancer back in this breast again.
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JOSEPH LOHMULLER, MD, FACS: Now she could have perhaps chosen to have just a mastectomy; possibly a mastectomy with breast reconstruction. Would that generally be considered to be an equivalent treatment for breast cancer of this nature?
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DAVID J. AANESTAD, MD: Yeah, that…that was also an option for her. And from a survival standpoint, those two operations, breast conservation and mastectomy, are essentially equivalent, with some exceptions. There may be some slight difference in local recurrence, but it's fairly minimal with the use of the radiation. So it's really an option. And anybody who gets breast cancer will have to sit down and have a discussion with their surgeon about what surgery they want; and that can sometimes be sort of confusing and difficult to work through those options. All right. I think I'm going to trade positions here with my assistant so I can get a…a good access to the other side. Why don't you just stand right here.
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JOSEPH LOHMULLER, MD, FACS: Maybe while you're moving we'll talk a little bit about some of the factors which might lead one to choose a mastectomy. And maybe I'll just talk about those for a second while you change your position and get reset.
DAVID J. AANESTAD, MD: That would be fine.
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JOSEPH LOHMULLER, MD, FACS: One would be, as on this patient's mammogram we only see one tumor, or one what…tumor which appears to be malignant. In patients who have more than one cancer, it would be…most of the time the ulti….optimal treatment to remove the breast. Some patients have a very large tumor, and yet they have a…a very small sized breast. And if we were to remove the tumor, you might in essence remove half or more of the breast leaving them with a very cosmetically unacceptable result. And, in that situation, it's often better just to consider going directly to the mastectomy and possibly couple that with a breast reconstruction.
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Patients who have had a cancer previously in the breast and have a cancer…either a new cancer develop in the breast or a recurrence of the cancer that was previously removed and treated with radiation, will have already had a series of radiation treatments and it's usually quite impossible to treat them a second time with radiation. And so a new cancer or a recurrent cancer in a breast previously treated with radiation, we would generally recommend a mastectomy for that patient.
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Now, most of the time we recommend….or, at least discuss the option of consideration of breast reconstruction with patients. Although, there are some patients who may not be good candidates for reconstruction, it does sometimes improve the length of the…increase the length of the operation, the complexity of the operation and potentially the risks and complications of the operation. However, in many, many patients are actually excellent candidates for breast reconstruction.
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I guess the last comment I'd make about breast reconstruction is it…it can either be done simultaneously with the mastectomy or there are times when patients aren't exactly certain whether they want to have it or not, or they have another set of treatments that they're waiting to undergo first and reconstruction can be done in the future if they so choose. So,

if you're not certain you can always delay the decision and then make a decision in the future that you'd like to have breast reconstruction.
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DAVID J. AANESTAD, MD: We're almost around the tumor now. And we're going to be pulling this up kind of into the field and then we'll orient it with sutures and send it down to the pathologist. Just a little bit more dissection here and I should have it out. Let me have a Alice, please. Okay, flatten that hole just a little bit. There you go.
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JOSEPH LOHMULLER, MD, FACS: Now, David, you mentioned that you're going to orient it with sutures, and why is that necessary the…the pathologist knows the orientation of the tumor in the breast?
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DAVID J. AANESTAD, MD: Well, it helps us to…Hold that, please. Switch hands. It helps us to make sure that we can communicate between us and the pathologist about margin status. And, again, margin means…you know, the goal of a lumpectomy…the goal of the…the lumpectomy is to remove the cancer with a margin of normal tissue around it. Again, in order to not have an increased risk of local recurrence we do not want to cut through the cancer or leave any cancer behind.
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And, when we send this down to pathologist, that's one of the things they'll be looking at to determine whether our margin is adequate. Have we gotten around it with leaving enough normal tissue around it. In order for them to communicate to me….hold it like that…that margin status, they need to be able to orient it in space. And the breast can be sort of difficult to maintain your orientation, because it…it sort of moves as the patient moves and the tissue is pliable and collapses on itself and…so the…the sutures help the pathologist understand how the…the lump was oriented within the breast when I took it out.
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JOSEPH LOHMULLER, MD, FACS: Now we see you again and again check the tumor with your finger. And that must be what you were describing earlier when you want to make sure that you're cutting through normal breast tissue to take a normal area of the tissue next to the tumor so you don't cut through it. Is that right?
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DAVID J. AANESTAD, MD: That's correct. Yeah.
JOSEPH LOHMULLER, MD, FACS: Okay.
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DAVID J. AANESTAD, MD: That's…it's my guide as to making…trying to make sure that the tumor is essentially in the center of my resection. Okay, come this way now.
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JOSEPH LOHMULLER, MD, FACS: Now if the pathologist were to call back and say, gee, on the…the superior margin or the deep margin, you're really close. What would you then do based on that report?
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DAVID J. AANESTAD, MD: Well, again, that's why that…that suture orientation is important. If I know that a certain wall of this cavity that I'm making is going to be positive, I can always go back during the case and take a little more tissue. And that's essentially what I would do…Oops, keep that retraction….is to go in and re-excise the wall of the cavity that was too close or that was positive. So we'll be paying attention to that when we send this to the pathologist, is their assessment of that margin.
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JOSEPH LOHMULLER, MD, FACS: SO then they can tell you whether the…the new area that's been removed actually has any of the cancer associated with it or not.
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DAVID J. AANESTAD, MD: And I'm basically down to the…to the pectoralis muscle. There's no reason to take that muscle out unless the tumor's growing into it; in this case it doesn't feel that way, so I'm starting to peel this specin…specimen up off of that…that muscle here.
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Hold it like that. Okay, now shift the hole. See where else it's holding.
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JOSEPH LOHMULLER, MD, FACS: You know, on the video, David, it looks like there's actually a fairly large piece of the breast that you're taking out to get these clear margins that you've spoken about.
DAVID J. AANESTAD, MD: Uh huh.
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JOSEPH LOHMULLER, MD, FACS: How does this look then, once the patient has had it all sewn back together and it's healed? Does it…does it have a big divot in it. It looks like you're taking a big enough piece that you've have a chunk missing.

DAVID J. AANESTAD, MD: Well----
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JOSEPH LOHMULLER, MD, FACS: But, what does that actually look like once it's healed?
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DAVID J. AANESTAD, MD: It can change the contour of the breast, there's no question. Immediately what will happen is this fluid….this cavity will fill with fluid, and we call that a seroma. And it's the lymphatic or tissue fluid of the breast, will fill the space that we leave behind. And initially that will maintain the contour of the breast. Slowly over time, that fluid will be reabsorbed and it will fill in with scar tissue.
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And, again, it may have some change in the contour of the breast. And that's probably more visible in a smaller breast, and also when you have to operate in the upper inner quadrant of the breast. So, she may have some change in the cosmetic appearance of her breast from this operation, but….
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JOSEPH LOHMULLER, MD, FACS: I suppose when you compare that to the change that the patient might have after mastectomy though, it's considered by most women to be a remarkable improvement just to have a small scar on the breast….
DAVID J. AANESTAD, MD: Certainly.
JOSEPH LOHMULLER, MD, FACS: …compared to actually not having a breast at all.
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DAVID J. AANESTAD, MD: I'm just trying to…There's one little area of tissue here that's kind of tethering me and holding the mass still into…in the cavity, so I'm trying to identify that so I can free it.
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JOSEPH LOHMULLER, MD, FACS: Right.
DAVID J. AANESTAD, MD: And hold like that.
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JOSEPH LOHMULLER, MD, FACS: Now as you can see by the procedure that Dr. Aanestad is doing, the…the goal of removing the entire mass is one of the critical components to treatment of a breast cancer when one's doing breast conserving therapy. And you can see the care he takes in the excision of the mass to make sure that he has the entire mass removed. As he mentioned during his commentary as he was proceeding, one does not want to leave any of the cancer cells behind.
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And this very careful palpation or feeling of the mass, looking at the mass and making sure that all the tissues surrounding the areas are normal is what a surgeon will do. Now that

may be somewhat misleading also, and this is why the real standard that the tumor has been completely excised is under the microscope by the pathologist.
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That will be our next step is to have the specimen sent to the pathologist, who will then use the sutures that Dr. Aanestad will place for orientation, actually cut through the specimen with multiple different slices and then both examine it with the naked eye and make slides to look at it under the microscope immediately.

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Now this technique of pathologic examination during the operation is designed for several purposes. One is to confirm the diagnosis of an invasive cancer so that Dr. Aanestad knows indeed he has to proceed with checking of the lymph nodes to see if any cancer has spread into the lymph nodes. The second thing is to ascertain that the margins are clear.
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And the slides that a pathologist can make during an operation are performed with a technique called frozen section, which allows a very rapid construction of a slide and allows the pathologist to review it under the microscope. There are several problems with frozen section which can be misleading. First, we don't have all day with a patient asleep and he would have to go ahead and make usually one or two slides to check…to make sure it's a cancer and to see if the margins are clear.
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Now, the permanent analysis, the permanent slides which will be made, will be on a specimen that has been fixed; usually for twenty-four hours in formalin and then many more slides will be made so that each margin can be carefully examined under the microscope so that we can make sure as possible that all of the cancer has been removed. There may be some small strands of cancer that are not visible to the naked eye, that are not on the slide that the pathologist makes at this time. So as you can see, he's placing his orientation sutures at this time and will have the specimen ready to go to the pathologist here within just a moment.
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David, how are you putting the sutures in so that the pathologist knows which side is what?
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DAVID J. AANESTAD, MD: Well, I'm putting…I'm going to mark this one with a double stitch and it's going to be on the deep aspect. There, you can see it's a double there. And then this one is going to be a single stitch on the superior. And you want to…you want to put the sutures in a way that it makes it clear to the pathologist what direction is what. So usually want those…Just cut one of those, please. So as this goes down to pathology, they can say the single stitch is going to be the superior aspect and the deep stitches are...or, the double stitches on the deep aspect. And that should…that should allow the pathologist to realize that this specimen was oriented just like this within the breast. So…that's the idea.
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So this is the specimen. The mass can be felt in the middle here. So, it feels to me like we're well around it. I don't think we cut through any tumor that I could tell. That looks like normal breast parenchyma around it, normal fatty type tissue. So we're---
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JOSEPH LOHMULLER, MD, FACS: So you don't…you don't actually see the tumor…in the…You don't actually see the tumor there.
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DAVID J. AANESTAD, MD: So we're going to send that down to the pathologist now. And, they will evaluate it. It takes a few minutes for them to give us their feedback.
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JOSEPH LOHMULLER, MD, FACS: Okay. So, as we wait for the pathologist's results of the frozen section analysis and their inspection of the tumor to make sure that the margins are clear, Dr. Aanestad will close this wound and get ready for the next step of the operation, which will be the sentinel lymph node biopsy. The wound here, as he mentioned, will fill with serum. There may be a small amount of blood that fills that pocket.
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And, the breast remodels itself quite well. And, often when a patient looks at the breast after a lumpectomy, such as this, you see a scar, but you don't really see much else in the way of distortion of the breast. So, that actually leaves patients with quite a good cosmetic result in the majority of cases.
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Now, if the pathologist confirms that this is an invasive cancer, then we are going to be very interested in whether or not this has spread anywhere. The most likely place that a breast cancer is going to first spread would be into the lymph nodes that sit right under the arm on the same side as the breast cancer. One can determine that by doing what's called a lymph node biopsy, and it's not just any lymph node that you want to remove. You want to remove what is called the sentinel lymph node.
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Now this is a technique that's been available for about ten years and which has been done here at Genesis Medical Center for the last nine years. At our Center for Breast Health here at Genesis, we were involved in one of the first national trials as one of the community cancer centers in a clinical trial sponsored by the Department of Defense and which was coordinated by the Moffitt Cancer Center at the University of South Florida in Tampa.
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RAJ SEKHARAN, MD: Do have a tissue diagnosis or do you want me to freeze it?
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DAVID J. AANESTAD, MD: No, just tell me whether it's invasive. I only need to confirm invasive. I know…I know it's…we [unintelligible] is what we've got.
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RAJ SEKHARAN, MD: Okay. It's obvious cancer. It's an invasive cancer on the growth.
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DAVID J. AANESTAD, MD: Okay.
RAJ SEKHARAN, MD: And the margin looks okay.
DAVID J. AANESTAD, MD: All right.
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JOSEPH LOHMULLER, MD, FACS: Our surgeons traveled to the Moffitt Cancer Center to review the procedure with the principle investigators at that site and then began enrolling patients here in 1998. We actually contributed…The first several hundred patients contributed to this trial, Genesis contributed thirty-seven patients, the first thirty-seven patients that were done here. Since 1998, when the sentinel lymph node biopsy procedure was done, we've done approximately seven hundred and seventy-three of these operations for breast cancer here.
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Now, in the old days, one might say, we would actually determine whether it had spread into the lymph nodes just by removing all of the lymph nodes under the arm, which often ranged anywhere from ten to thirty lymph nodes in the…what are called the Level One and Level Two lymph node areas.
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The problem with removing all the lymph nodes is that patients have more side effects from a more extensive operation. So with that, the idea of determining if there is a sentinel lymph node, one that would basically serve as an indicator that the tumor had spread, if we could just remove one or two of those and…and we knew that that was an accurate

indicator of whether or not there was cancer in the lymph nodes, we could avoid removing this large group of lymph nodes in the majority of patients.
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Now even small tumors may spread into the lymph nodes. And, the thing is, is that in small tumors only about fifteen percent of patients have lymph node metastases. So eighty-five percent of patients were having lymph nodes removed and they were normal. So anything we could do to minimize the side effects that people might have from surgery, or the potential complications they might have from surgery, was thought to be pretty worthwhile. And so far the sentinel lymph node biopsy process has seemed to work out very well in that regard.
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We're able to do much smaller operations in patients. They have less discomfort. They have fewer complications. And, yet, we still get accurate information about their clinical stage. There are some patients who still require a full lymph node dissection in the axillary lymph node basin – patients who have obvious spread of cancer into the lymph nodes, patients in whom the sentinel lymph node is found to have cancer cells in it by the pathologist, which we'll talk about as Dr. Aanestad does that part of the procedure, and patients who have an inability to find a sentinel lymph node. And that is something, again, we'll talk about.
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But it may be that we're not able to actually detect a sentinel lymph node because of the fact that it's filled with cancer. It may block the flow of both the radioactive material, injected earlier by the radiologist, and the…the blue dye that Dr. Aanestad injected here.
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DAVID J. AANESTAD, MD: So that means we're done with the breast portion of the procedure and I've sutured that wound closed. And now we're going to proceed with the sentinel lymph node biopsy. I'm going to just show you one of the tools that we use here. This is called the neoprobe and it's sort of like a Geiger counter; it…it detects radioactivity.
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The area in the breast where they inject the majority of the radioactivity has…has the most radioactivity in it and so, if you guys can hear the beeping, that's the Geiger Counter telling me that there's radioactivity in this portion of the breast. And we'll use this neoprobe to interrogate the axilla, and that actually is pointing into the axilla and that's probably one of the sentinel node…sentinel lymph nodes that's been marked. So now we're going to make an incision and try to identify that sentinel lymph node.
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All right, we're making the incision now and, again, you can see we're using the electrocautery instrument. And you can see it at work. See these little blood vessels at the skin level. They lead with the…with the sharp incision using the knife. But when you use the cautery, it generally controls the…Okay, you can…you can move this hand out of the way. Just step…step your shoulder back a bit. Okay.
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And as you can see, we can generally do this procedure through a fairly small incision in the axilla, which causes really minimal discomfort for the patient. So we're going to dissect down through the subcutaneous fat and try to get our way into the axillary fat pad. And as I'm going down, especially as I get close to that axillary fat pad, which contains all the lymph nodes that, again, drain the breast. And they brain basically up through the tail of the breast and then into the axilla.
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And as I get down there, I'm going to start looking to see if I can appreciate any green/blue dye. Sometimes you can see the lymphatic channels individually. Let me have the [Sen?].
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JOSEPH LOHMULLER, MD, FACS: David, we…we see some black marks just above the incision where you've made that. Maybe you could explain to the…what those are for and who made those.
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DAVID J. AANESTAD, MD: The radiologist used a picture called lymphocentigraphy preoperatively. And that was done after a time period. Of course, they injected the radioactivity and…and they wait a certain time period and then take a picture to detect the radioactivity. And, when they lymphocentigraphy with this patient they localized two areas of uptake in the armpit. And so to try to aid me in finding those areas, they put a mark in the general area of the lymph node. So I…I know that at least at this level is probably where the lymph node is in the axillary fat pad.
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JOSEPH LOHMULLER, MD, FACS: Now I notice that you didn't make your incision right at that mark. You made it a little bit lower. Why is that?
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DAVID J. AANESTAD, MD: Well, I…I basically put my incision at this location all the time. I usually use a transverse incision just below the…the axillary hairline. And it's because the precise location of the lymph node is not entirely reliable, based on that nuclear medicine study. It's just not a very…It gives us the general area, but it's not a very precise localization; at least not precise enough to use to place the incision. All right, let me have a….
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JOSEPH LOHMULLER, MD, FACS: You know, one of the concerns that patients often voice when they're presented with this idea of the sentinel lymph node biopsy is they're a little bit fearful when we explain to them that we're going to inject a radioactive material into their body. How do you explain that to your patients so they understand what the potential risk of that radioactivity might be?
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DAVID J. AANESTAD, MD: I always convey to the patients that this is a very small amount of radioactivity. It's far less than the amount of radiation you would receive or would be exposed to if you were getting a chest x-ray. She's…a little bit light. And so, that's a small amount of radiation and really poses minimal risk to the patient.
00:33:15
One of the good measures of how much risk it is, is what the patient…what the people who deal with that radiation all the time have to do and we really have to take minimal precautions in terms of what we wear. And by we, I mean the surgeons and operating room staff. We're obviously cautious with the radioactive material, but it's not enough risk to us that we have to wear lead or…or take any real significant precautions, so…I tell them those things and I think most of the time they're reassured by that.
00:33:47
Now, I don't know if the camera can appreciate this, but I can already start to see a little bit of green staining here. I don't know if you want to come in closely. This is just the…just a little bit….
00:34:01
JOSEPH LOHMULLER, MD, FACS: That is visible to us on the camera.
00:34:03
DAVID J. AANESTAD, MD: All right. So you can start to see some green staining . That may be my node. That may be a channel containing that green staining. And that…if it's a lymphatic channel should lead me down to the sentinel lymph node. So I'm going to keep an eye on that and continue to dissect around it, carefully, trying to expose it but not cut through the channel and lose my spot.
00:34:29

JOSEPH LOHMULLER, MD, FACS: Now I notice that you…since you've started this part of the operation you've not actually put the radiation sensor in the wound. And, is that just because you can tell where to go based on the blue dye or---
00:34:42
DAVID J. AANESTAD, MD: I usually try to get my…at least the exposure of the…the axillary fat pad first and then I start to look with the radioactive probe. And I think we've been sort of fortuitous in that we've started to see green dye already. Sometimes you'll see it right away, sometimes you have to…you have to hunt a little bit more for it. We can put the neoprobe in there now and see if this area corresponds to our area of uptake. And indeed, if you can hear the beeping, the machine is telling us that there's an area of radioactivity right in this location. So…that's confirming for us that we're getting close to a sentinel lymph node. Why don't you give me the small Richardson's now.
00:35:28
JOSEPH LOHMULLER, MD, FACS: We talked a little bit earlier about the fact that sometimes we cannot find a sentinel lymph node. And I mention that one of the reasons that that is a problem is that the lymph node itself is choked with cancer cells already. And in those types of patients, obviously, then we wouldn't see these blue channels. And I might go on to explain a little bit about that.
00:35:52
The…If the lymph nodes, which Dr. Aanestad mentioned earlier, sort of serve as biological filters are plugged with cancer cells, there's no flow of the tissue fluid, or the lymphatic fluid through them. And so neither the blue dye nor the radioactive fluid can actually get into the lymph node itself. And this exactly one of the reasons why if we are unable to successfully find a sentinel lymph node we go right ahead and take all the lymph nodes out, because one of the main reasons for that is that the…the lymph nodes themselves have already enough cancer in them that there's no flow.
00:36:30
Here at our center, there's well over a ninety percent find rate and, certainly, our surgeons who have been trained in this procedure are continually monitored that they are…they're doing a good job. And, we check and see that they're actually able to do the procedure with a high degree of accuracy. David, are you getting any closer to what might be a blue lymph node, or a ..one that you would call a sentinel lymph node?
00:36:56
DAVID J. AANESTAD, MD: I'm still…I can see an area of green staining here. Now that actually maybe be sort of a false staining. Sometimes the dye can actually make it's way out into tail of the breast, and especially in a thin person like this patient, it…it can give you a bit of a false sense, in terms of finding it. I think I can still see some green a little deeper here and I'll see if I can expose that a little better for you in just a second. But we're definitely down to the level of the axillary fat and it has a little different consistency to it, compared to the subcutaneous fact. And that's kind of how we know we are where we need to be. Let me have a hemostat. Now, again, right in this area you can kind of see a little green shining through that fat.
00:37:48
JOSEPH LOHMULLER, MD, FACS: Yeah, we can sure see that. That…that shows up very well in that projection, for us to be able to see exactly what it is you're talking about.
00:37:55
DAVID J. AANESTAD, MD: And, if I can spread over it just a little bit, I think….that may end up being where we need to be.
00:38:07
JOSEPH LOHMULLER, MD, FACS: You are getting just a little bit behind the head of the Richardson retractor. I don't know if that could be placed just a little bit deeper in the wound so we could just see around the corner of it…separate that.
00:38:17

DAVID J. AANESTAD, MD: Let me try this way.
00:38:20
JOSEPH LOHMULLER, MD, FACS: I think that did it. That's great. Thank you.
DAVID J. AANESTAD, MD: Bovie again.
00:38:28
JOSEPH LOHMULLER, MD, FACS: Now how many lymph nodes might there be in the area under the arm?
00:38:33
DAVID J. AANESTAD, MD: Well, as you mentioned earlier, there are numerous lymph nodes. And if you do an aggressive full dissection, you…you might harvest thirty or more. But sentinel nodes, we usually find only a few. Sometimes it's one. Sometimes it can be as many as five or six. It depends on the lymphatic flow and the individual anatomy of the patient.
00:39:04
JOSEPH LOHMULLER, MD, FACS: The…the idea that you only take out one or two or the lymph nodes and that...I mentioned earlier results in fewer complications. Maybe you could tell us a little bit about what types of complications do patients get when they have to have all the lymph nodes removed. And maybe compare that to what is the benefit of not doing such an aggressive dissection when possible.
00:39:30
DAVID J. AANESTAD, MD: Well, a full axillary dissection, one of the main complications that we see and that we try to avoid with a sentinel node dissection…Let me have that hemostat….is lymphedema, or arm swelling. These lymph nodes drain not only the breast, but also the arm on this side of the body. And, if you disrupt a lot of the lymphatic channels, then the tissue fluid from the arm may have a problem emptying. And, there's a fair number of patients who will have arm swelling with a full lymph node dissection. Maybe as high as fifteen percent will have symptomatic.
00:40:11
And, actually, if you look more closely with very sensitive tests, you can find a higher number who will have some change in…in their lymphatic flow. So we…we minimize that risk quite a bit with the sentinel lymph node biopsy because we disrupt fewer channels. And that's probably the biggest improvement. We generally use a smaller incision with the…with the sentinel node, so there's usually less postoperative pain. We also probably disrupt less of some superficial sensory nerves doing it this way. Okay.
00:40:50
JOSEPH LOHMULLER, MD, FACS: Now is it possible that a patient who has just a sentinel lymph node biopsy and radiation therapy to the breast on that side, is it possible a patient like that could get lymphedema as well, even though we've done less surgery?
00:41:02
DAVID J. AANESTAD, MD: It's certainly possible. I still tell my patients that there can be still as high as a five percent risk of lymphedema. Radiation can increase your risk a little bit if you…compared to not having radiation, because that can also compromise lymphatics. So we certainly don't have a zero rate of lymphedema but, again, we it's a…we think it 's a significant improvement.
00:41:29
Alright. Let's see if I can show you what I can see here. Hold like that. Hold like that. Now I… Give me another Debakey.
00:41:45
JOSEPH LOHMULLER, MD, FACS: We could certainly see that you're getting deeper into the axilla and further down into the axillary fat pad, that you were describing earlier.
00:41:55
DAVID J. AANESTAD, MD: Yeah. Right here…I don't know if you can see this. It's fairly subtle, but right there I can see actually a lymphatic channel. It's very small….

00:42:06
JOSEPH LOHMULLER, MD, FACS: We can see that.

DAVID J. AANESTAD, MD: But it has green staining.
00:42:08
JOSEPH LOHMULLER, MD, FACS: It's just a little streak there….
DAVID J. AANESTAD, MD: Right.
JOSEPH LOHMULLER, MD, FACS: That the unpracticed eye may not be able to detect, but you can see that line.
00:42:13
DAVID J. AANESTAD, MD: So that's kind of what we're looking for. It's small, but definitely has staining. And so we'll use that as a guide and hopefully it'll…Okay. This right here is a lymphatic channel. It has our dye in it. So that sort of demonstrates how that dye gets to the lymph node. And frequently we'll find that where we find the trail and then it makes its way right down to the lymph node. So, we'll try to, again, check again with our neoprobe and make sure we're making progress and headed the right direction.
00:42:56
JOSEPH LOHMULLER, MD, FACS: Now if you….if you're hearing any radioactivity, unfortunately we can't hear it with the microphone. So, you'll have to let us know whether or not that's something you can detect.
00:43:06
DAVID J. AANESTAD, MD: Okay.
00:43:15
JOSEPH LOHMULLER, MD, FACS: I have another question for you about the general care of these patients, David. And, when we do this operation and we just make this small incision and we go in and take out one or two of the lymph nodes, do these patients have to stay in the hospital or are…are they able to go home the same day?
00:43:32
DAVID J. AANESTAD, MD: No, typically this is a…does not require an inpatient stay, unless the patient has some significant medical problem that makes them a higher risk. But generally speaking, we can let these patients go home the day of surgery.
00:43:47
JOSEPH LOHMULLER, MD, FACS: Do these patients, with a sentinel lymph node, have to have any special drains or…or other things sticking out of their body when they go home?
00:43:57
DAVID J. AANESTAD, MD: They usually do not. If you have a mastectomy or if you have a full lymph node dissection, then I usually will leave a drain because the fluid that accumulates in those wounds can be enough to cause a…an issue for the patient. After a sentinel lymph node biopsy, usually we…we disrupt less tissue and have less problems with fluid collection. So, I don't typically put in a drain after a sentinel node biopsy.
00:44:26
JOSEPH LOHMULLER, MD, FACS: I see that you're using the probe again. And, as I mentioned, we…we can just barely hear whether it's telling us----
00:44:31
DAVID J. AANESTAD, MD: Yeah, if you can hear it, I have a significant reading there now. That indicates that I'm pointing in the right direction.
00:44:40
JOSEPH LOHMULLER, MD, FACS: We can hear that beep, yeah.
00:44:40
DAVID J. AANESTAD, MD: It's a little…it's a little deeper yet, I think. So, we're going to continue to dissect down through this tissue carefully.
00:44:51

JOSEPH LOHMULLER, MD, FACS: Do patients who have this procedure need to really restrict their activity quite a bit, or are they able to do most things that they might normally want to do?
00:45:01
DAVID J. AANESTAD, MD: Most of the time they don't have a significant restriction of their activity. I think most people do very well, in terms of their discomfort. There's really less than you might imagine. And so, no, there's not a significant issue with limita…limitations. Now I can actually start to feel…You can't…you guys can't appreciate that, obviously, but I can actually start to feel a lymph node that I suspect is…is our sentinel node. So I'm…continue to work down towards it.
00:45:42
JOSEPH LOHMULLER, MD, FACS: You know, it seems like as we look at this patient has a small incision on her breast and this small incision under her arm, I assume you're going to close that up in a similar manner with this hidden stitch. Is…is the patient going to require more surgery for this breast cancer? Or, if she has good margins and a negative sentinel lymph node is…is she done?
00:46:06
DAVID J. AANESTAD, MD: Well, she has a high probability of being done. We do have some inherent limitations in terms of pathology. Our pathologist can only tell us so much about the tissue that we wend them during the course of the operation, because we obviously can't keep a patient asleep for hours and hours and days on end. So, occasionally we'll have a lymph node that is initially read as negative that will come back positive, and that will sometimes change what we have to do.
00:46:35
And the same is true for margins in the breast; occasionally we'll get an indication that the margins are clear, but when the pathologists look with their more precise tests they will find something that wasn't appreciated initially. And in those cases, patients do sometimes require another trip to the operating room to accomplish what needs to be accomplished.
00:46:56
All right. Now I can feel this lymph node and it's right in here. And I think you can sort of appreciate a little bit of staining with the dye.
00:47:08
JOSEPH LOHMULLER, MD, FACS: Its' a little bit hard to see. If the medial retractor is pulled just a little more…there you go. That's good. We can see that very well now.
00:47:15
DAVID J. AANESTAD, MD: Right. Now, I'll point it out to you again. This is the lymph node and----
JOSEPH LOHMULLER, MD, FACS: We sure can see that.
00:47:19
DAVID J. AANESTAD, MD: ---and it's a little bit discolored, consistent with our dye finding the node. And when I put the probe on it, if you can hear the…the neoprobe, it's really going crazy there. So that's a very high reading and that indicates that's…that's probably our sentinel node, or one of them.
JOSEPH LOHMULLER, MD, FACS: Okay.
00:47:35
DAVID J. AANESTAD, MD: So now we're going to dissect around that and I try to look for the lymphatic channels and occlude them with a clip, if I can, to try to…
00:47:50
JOSEPH LOHMULLER, MD, FACS: That shows us the picture very nicely there.
00:47:54
DAVID J. AANESTAD, MD: Yeah. I'm trying to stay out of the…so…
00:48:05

JOSEPH LOHMULLER, MD, FACS: Now, with this then, we may find that if this patient has a negative sentinel node and she goes home today, and she doesn't require any more surgery, she may actually never spend a night in the hospital for surgery for her breast cancer.
00:48:18
DAVID J. AANESTAD, MD: That's true. This can be managed completely outpatient.
00:48:23
JOSEPH LOHMULLER, MD, FACS: We might comment to people watching that this was a completely different story even just twenty-five years ago when really the standard of care was to do a mastectomy. And it wasn't until studies were done in the 1970's and the data retrieved in the late 1970's and early 1980's that it became apparent that this breast conserving method worked just as well as a mastectomy and patients being cured of their breast cancer. And it has been demonstrated that the survival with either mastectomy or breast conserving therapy, and properly selected patients I might say, is equal.
00:49:03
And so, in days of old, when patients would come in and have a mastectomy, they might spend a week in the hospital while they heal from that. And…and now, of course, this patient will probably go home the same day that she came in, have just two small incisions, which may hurt a little bit but probably not very much and hopefully never have to spend another day in the hospital because of this breast cancer as an individual.
00:49:30
DAVID J. AANESTAD, MD: Do you want to do that in vivo count there? Did you do that? Dee? Did you do an in vivo count there?
00:49:41
JOSEPH LOHMULLER, MD, FACS: We can sure hear a beeping. It sounds like you have a radioactive---
00:49:43
DAVID J. AANESTAD, MD: Yeah, we're…we're just measuring the radioactivity here before we remove this. I think I have a chain, actually, of lymph nodes which…which sort of corresponds to what we saw on the…on the lymphocentigraphy. And, again, I think it may be hard to appreciate, but there's a little bit of green staining here. And I think it's in a lymph node that's just a little further up. It could also be in the lymphatic. This way.
00:50:09
So…it seems to have faded a little bit since I first uncovered it, but in here we also see some green. So…so I'm pretty confident these are going to be the lymph nodes that we need. And in a just a minute here we should have them out and we'll send them down to our pathologist.
00:50:31
JOSEPH LOHMULLER, MD, FACS: Now you just said something that we might talk a little bit more about. You said that the…the blue dye faded a little bit from the time you…you first saw it. It had sort of a green appearance in the tissues, because of the mix with the yellow fat and all. What…what do you mean it's faded a little bit? Do you have just a certain amount of time in which to work to get this procedure done?
00:50:52
DAVID J. AANESTAD, MD: Well, you do sometimes see some changes. The lymphatic system never stops doing what it does and so over a length of time this…this stuff will work it's way out of the lymphatic system. Now usually it's there plenty long for us to identify the places that we need to identify. But, it…it's usually not an issue for us. Let me have another clip.
00:51:19
JOSEPH LOHMULLER, MD, FACS: We might even comment that at…at some centers where they have a little bit more of a logistical problem with coordination of services than we have here at Genesis, some centers they actually inject the radioactivity the night before. And

they…it can stay in there much of the day; anywhere from eight to twelve hours, so that…or…or even longer, so that these lymph nodes may remain somewhat radioactive even into the next day.
00:51:47
We have a pretty smooth system here, so our radiologists are able to do this just a few hours ahead of time. And with the coordination of the services that we've been able to establish, these patients don't have to make two trips to the hospital. They don't have to come the day before. They can just come in the day of their surgery a little bit earlier than might normally be required for an outpatient operation, have their injection of the radioactive material and then have the procedure done right then.
00:52:17
So it looks like you're…you're cutting things apart to get ready to take this out.
00:52:20
DAVID J. AANESTAD, MD: Yeah. I can feel…There's actually one node in here that's.... feels a little bit enlarged and is slightly suspicious clinically. Again, here's some more green. I don't know if you can appreciate that, but that tells me we're working in the right area. Can you see that green?
00:52:35
JOSEPH LOHMULLER, MD, FACS: It's a little bit difficult to see in this projection. So if…if you see a clinically suspicious lymph node that's…that's neither green or stained with the…the dye, or it's not radioactive, what do you do with that lymph node?
00:52:51
DAVID J. AANESTAD, MD: We still remove those lymph nodes. And I always sort of palpate what I can of the axilla to make sure that I don't feel anything that's clinically suspicious. Most of the time the accuracy of the sentinel node is good. But, again, if you had a lymph node that was filled with tumor it might not light up with green dye or radioactivity, as you had mentioned earlier. So we always…I always check and make sure I don't feel anything . We do that preoperatively as well when we examine the patient to make sure there's no palpable lymph nodes.
00:53:25
JOSEPH LOHMULLER, MD, FACS: Now what…what do you mean it is clinically suspicious? What is it exactly that you're looking for that tells you that that lymph node may already have cancer cells in it. even though it's not stained or radioactive?
00:53:37
DAVID J. AANESTAD, MD: Well, lymph nodes that are enlarged or that have a consistency that are…that are more dense than you would expect them, to me are…are nodes that are clinically suspicious. So…that's kind of what we pay attention to, typically.
00:53:56
JOSEPH LOHMULLER, MD, FACS: So it's somewhat similar to when you excise the breast cancer itself and you are just carefully checking with your finger repeatedly to make sure that you were cutting through soft normal tissue. The lymph nodes that may have cancer in them that would be suspicious may actually be quite hard and firm, just like the cancer itself was.
00:54:17
DAVID J. AANESTAD, MD: That's correct.
00:54:18
JOSEPH LOHMULLER, MD, FACS: Okay. Okay.
00:54:28
This…this looks like you're…you're just about around this…this group of lymph nodes. And do you have a sense as to how many lymph nodes you're actually taking out or is it difficult to tell based on the fact that there's some fat and it…it may be not exactly sure?
00:54:47

DAVID J. AANESTAD, MD: Well, I think I…I think I feel two distinct nodes here. This is the main lymphatic channel that I'm putting a clip across now. I'll try and who you again. There's green in this lymph node right here. So, I don't know if you can appreciate that.
00:55:04
JOSEPH LOHMULLER, MD, FACS: The retractor in the lateral parts…There we go. You can just see a little bit of the green channel.
00:55:07
DAVID J. AANESTAD, MD: Just a little bit of green and it's going up this direction. And I've just occluded that last little lymphatic. Go ahead and see…
00:55:19
JOSEPH LOHMULLER, MD, FACS: So this idea of a touch prep, maybe we could describe that.
00:55:25
DAVID J. AANESTAD, MD: Well, you may be more familiar with that than I am. I'm not sure I know all the pathologic details of a touch prep.
00:55:31
JOSEPH LOHMULLER, MD, FACS: Okay. There is a…there's a technique that one can use to do a very rapid assessment of the lymph node. And, the lymph node is actually taken by the pathologist and with a knife the lymph node is just cut right down the middle. And then the…the edge of the lymph node itself is touched onto a glass slide. And when one does that, the cells that are on the surface of the lymph node will actually stick to the slide. The lymph node is pulled off and the slide is immediately fixed and stained so that those cells that have actually stuck to the glass can be examined.
00:56:08
Now the pathologist can then look at those cells and determine whether they look like benign lymph node cells or whether there are any breast cells that might be present. If they're breast cells in the lymph node, we know immediately that they're malignant. Normal breast cells are generally not in the lymph nodes at all, and so if the pathologist sees cells that should be in the breast or that are obviously malignant in their appearance, then they can tell us that that is positive.
00:56:37
Now a touch prep has a…a few limitations and they are not looking at a whole slice of this lymph node itself. They're just looking at the cells and not the pattern of them, and that can be a little bit difficult for a pathologist to interpret based on the appearance of these cells.
00:56:52
Dr. Aanestad also mentioned a frozen section, which is exactly the same as when we discussed the breast itself. The lymph node can be cut into small pieces and a…a piece of that frozen and a slide made of that and the lymph node itself examined.
00:57:11
Generally we use touch preps because they're very quick and they're generally accurate. And then frozen sections if there's a concern or some ambiguity by the pathologist. So, our pathology department is prepared to do either one so that hopefully we can come to an accurate assessment of the lymph nodes and avoid having the patient have to come back for a second operation. So with that, we hope to have an accurate information from the pathologist by either touch prep or frozen section relatively quickly during the operation.
00:57:48
DAVID J. AANESTAD, MD: There's one here. Really, you can feel them better than you can see them. There's another right here. Okay?
00:57:56
JOSEPH LOHMULLER, MD, FACS: Are they radioactive?
DAVID J. AANESTAD, MD: Right there is a…is a lymph node.
JOSEPH LOHMULLER, MD, FACS: Yeah.

00:58:03
DAVID J. AANESTAD, MD: Now, again, we'll put the neoprobe on to confirm that we…we've got it. And right there we have that high count again.
00:58:12
JOSEPH LOHMULLER, MD, FACS: Right. We can hear the beeping from the machine.
00:58:13
DAVID J. AANESTAD, MD: So that's clearly our sentinel node. And we…we found green initially. It doesn't look as green now anymore, but I'm pretty convinced. And the other side of the specimen, let's see, there's a little bit of radioactivity. Quite a bit less, but still some activity there, so that's probably another sentinel node. And these are kind of in…in a chain together. So we're going to send these down as sentinel lymph nodes number one and two.
00:58:35
JOSEPH LOHMULLER, MD, FACS: Now you can…you can sort of get an appreciation, I think, by looking at that, how difficult it could be to actually find these small lymph nodes, because….they look a lot like the fat around them. And, particularly if they're normal, they're very soft and pliable just like the surrounding fat. So the mechanism to find them and making them either radioactive or turning them this blue-green color with the blue dye injection is really essential, because you could dissect right over top of a normal lymph node and have no idea that it's there. It's just disguised by the surrounding fat.
00:59:11
And so even in…in the picture that we just saw of the specimen that Dr. Aanestad's sending to the pathologist, really you know specifically that the lymph node is in there, because it's either a blue-green in color or it's radioactive. The fat itself will not turn radioactive.
00:59:27
DAVID J. AANESTAD, MD: I think I have one more node in here with neoprobe that I can find. So, after the first lymph nodes come out we look around a little bit more to see if we find anything else that's radioactive. And there's still some…still some radioactivity here.
00:59:42
JOSEPH LOHMULLER, MD, FACS: What does that imply?
00:59:43
DAVID J. AANESTAD, MD: Well, that implies that there's still a sentinel node to remove. And so, I think there's one right here. And, actually, I can feel this one as well, so I'm going to go ahead and remove a little bit more of this tissue.
00:59:58
JOSEPH LOHMULLER, MD, FACS: Now, how many nodes were you suspecting, based on the preoperative scan, the lymphocentigraphy by the radiologist?
01:00:05
DAVID J. AANESTAD, MD: It was either two or three. It was a little difficult to tell. He said, again, they were sort of in a chain. Actually, here…now that I've put my finger in, this is…this is a real good picture right here. Once again, here's…here's a green channel. This is one we were looking at earlier, okay? Can you see that green channel at the tip of my---
01:00:20
JOSEPH LOHMULLER, MD, FACS: I think just barely. With the video it's just a little bit---
01:00:22
DAVID J. AANESTAD, MD: And it's heading right down to this lymph node behind it.
01:00:28
JOSEPH LOHMULLER, MD, FACS: You get a…a sense that there's a bump there.
01:00:31
DAVID J. AANESTAD, MD: Exactly. But the channel goes right down to this node and it's definitely a green stained channel.
01:00:38

JOSEPH LOHMULLER, MD, FACS: So if it's either green or it's radioactive, it still counts as a sentinel node, correct?
DAVID J. AANESTAD, MD: The node counts, that's correct.
JOSEPH LOHMULLER, MD, FACS: Okay.
01:00:47
DAVID J. AANESTAD, MD: And so even there it's sort of subtle, but there is some green here in the lymphatic channel. There's green in this lymphatic channel. And, there's this node right over the tip of my finger.
01:01:00
JOSEPH LOHMULLER, MD, FACS: I wonder if that one's radioactive also?
01:01:02
DAVID J. AANESTAD, MD: Well, I…this is in the area I was just checking with the probe.
JOSEPH LOHMULLER, MD, FACS: I see.
01:01:05
DAVID J. AANESTAD, MD: I think it is. Now, I just divided the green channel. So we've about got this one out. Let me have that clip applier again.
01:01:14
JOSEPH LOHMULLER, MD, FACS: Okay. So, again, you're using the clips to try to minimize any bleeding or leaking of the lymph channels so the patient has very minimal swelling afterwards.
01:01:25
DAVID J. AANESTAD, MD: Exactly.
01:01:26
JOSEPH LOHMULLER, MD, FACS: Okay.
01:01:31
DAVID J. AANESTAD, MD: Yeah.
01:01:33
JOSEPH LOHMULLER, MD, FACS: Yes, they both go? Either one if it were positive would be…a reason to do a complete dissection?
01:01:41
DAVID J. AANESTAD, MD: Okay. This one's out. So there's the lymph node. Yu can appreciate that. You can see that a little bit better.
01:01:49
JOSEPH LOHMULLER, MD, FACS: So you're also going to send that…You're going to send that to the pathologist right away as well, am I correct?
01:01:53
DAVID J. AANESTAD, MD: Absolutely. Sometimes we sign…we find them in succession like this. So, again, we'll check this and if you can hear the neoprobe it's also----
01:02:02
JOSEPH LOHMULLER, MD, FACS: Boy, we sure can. It sounds like another radioactive lymph node.
01:02:04
DAVID J. AANESTAD, MD: So, another one that's green and radioactive. So the techniques work pretty well in this patient.
01:02:09
JOSEPH LOHMULLER, MD, FACS: So with these preparations by the pathologist, we might expect an answer back probably within about ten or fifteen minutes from the touch preps. They don't generally take very long to prepare. And, again, with our system, the pathologists are essentially on standby, understanding that these specimens should be in route and they're…they and their team of techniques who help them in the pathology department are prepared to process them immediately. Which makes for a relatively efficient operation.
01:02:43

Now, total lymph node removal then for this patient is probably just three lymph nodes, as opposed to the ten to thirty lymph nodes we talked about if the patient were going to have a full dissection. Is that right?
01:02:55
DAVID J. AANESTAD, MD: Correct.
01:02:56
JOSEPH LOHMULLER, MD, FACS: Okay. Well, hopefully, that will leave her with very little chance of swelling in the arm or problems with strange nerve sensations or discomfort under the arm. Now do you wait to hear from the pathologist before you start closing up the wound, or do you just go ahead and close it up at this point once you get the lymph node?
01:03:16
DAVID J. AANESTAD, MD: No. It's certainly in this situation where I felt a couple of lymph nodes that are…Actually, always I wait until the pathologist calls me to decide whether to close the wound. We've just received word back from the pathologist. They've evaluated the sentinel nodes that we identified and have indicated that all the sentinel nodes are negative for any evidence of metastatic disease. So that's excellent news for the patient. That means our procedure is complete. I'm going to close the wound and she…she's done.
01:03:48
I'll go out and talk to the family and they'll be happy to hear, I'm sure, that…that those lymph nodes have come back negative. So, I'm going to go ahead and close the wound. I'm going to send you back to Dr. Lohmuller to close tings out for us. Thanks a lot for coming.
01:04:05
JOSEPH LOHMULLER, MD, FACS: Thank you very much, David. That certainly is very good news for the patient and we'll hope that the final reports from the pathologist will confirm that there's no sign of any cancer in those lymph nodes. That will hopefully determine that the patient has an early stage breast cancer as opposed to one that's more advanced. And that would help then determine some of the treatment she would get in the future.
01:04:25
We certainly thank you for your attention and for visiting today here at Genesis Medical Center. And we'd like to thank all of the staff, both at the Center for Breast Health and here at the Genesis Medical Center, Davenport Operating Suite, as well as the production staff.
01:04:44
NARRATOR: Thank you for watching this breast cancer lumpectomy and subsequent sentinel lymph node biopsy performed from Genesis Medical Center in Davenport, Iowa.

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01:05:11
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