

**MINIMALLY INVASIVE COLON SURGERY
ST. MARY'S MEDICAL CENTER
DULUTH, MINNESOTA**

January 24, 2007

00:00:10

ANNOUNCER: Welcome to St. Mary's Medical Center in Duluth, Minnesota. Today's presentation, a laparoscopic hemicolectomy, is the second live webcast from the St. Mary's campus. Dr. Melissa Najarian of the Duluth Clinic will perform today's procedure while Dr. Thomas Wiig moderates. A minimally invasive hemicolectomy involves the removal of a portion of the colon through a 2-inch incision in the abdomen. Patients see many benefits from this less invasive procedure.

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MELISSA NAJARIAN, MD: The advantages of laparoscopic surgery include smaller incisions, it's more cosmetic, people recover faster because their incisions are not as large, and people have less pain, and there's a trend towards people spending less time in the hospital because the recovery's just a little bit faster.

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ANNOUNCER: Patients suffering from a number of conditions can all benefit from this procedure.

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MELISSA NAJARIAN, MD: Different reasons to have this procedure could include either colon cancer or a large colon polyp that they can't remove with the colonoscope. Or if somebody has Crohn's disease and has a narrowing at this particular part of their small or large intestine then they would need this procedure done.

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ANNOUNCER: Today's presentation will also include valuable information about colonoscopies and the comprehensive patient pathways programs at St. Mary's.

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THOMAS WIIG, MD, FACS: And we know that we have improved our length of stays, we have reduced complication rates, we have reduced costs, and we have improved patient satisfaction surveys.

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ANNOUNCER: To request more information or make appointments, press the appropriate buttons on your screen. Also, you can email your questions to the O.R. by pressing the MDirectAccess button. Now let's go live to the O.R.

00:01:53

Good evening from the operating room at St. Mary's Medical Center, one of the operating rooms at the St. Mary's Duluth Clinic Hospital System. St. Mary's Duluth Clinic Hospital System has four hospitals, and we're in one of those operating room tonight live for the presentation of our patients and the education for the public regarding invasive – minimally invasive colon surgery. I'm Dr. Tom Wiig. I'm the chief of the section of general surgery. With me here in the comment room is Dr. Jay Lenz, my associate in the department of general surgery and one of the surgeons who does a great number of minimally invasive procedures. Tonight we're going to be presenting you with a minimally invasive, or laparoscopic, colon resection. And in the operating room we'd like to join Dr. Melissa

Najarian, our colorectal surgeon who has been in the process of getting the operation underway. Dr. Najarian?

00:02:57

MELISSA NAJARIAN, MD: Good evening. Welcome to the operating room. I'm Dr. Melissa Najarian. I'm here with my assistants Chad Chordowski and Terry Sweeno, and we are going to be performing this minimally invasive right hemicolectomy, which means removal of the right side of the colon. And we've gotten things underway already. So far we have inserted the laparoscopic trocars, which are small ports through which we can put our small instruments and do the surgery. Right now I'll just give you kind of a little tour of where we are from the inside of things. Right now we are looking at the very beginning of the large intestine called the secum. Right here you can see the appendix, which attaches to the large intestine. And the small intestines right here comes in to meet the large intestine. This patient has two polyps, one around here in the secum and one in the ascending, or colon on the right side. And the colon here now comes up, meets at the hepatic, or flexure, or where the liver goes. This right here is the liver. Underneath that, the gall bladder. And then this would be about the point – the stopping point of our dissection. I want to emphasize that this patient had a screening colonoscopy, which means that he had these polyps found when he had no symptoms of any changes in his bowel habits or bleeding from his bottom. And he had two large polyps found, one of which contained a precancerous type of material and needs to be removed now with surgery. This would bring us to the point of the importance of doing screening colonoscopies. And Dr. Wiig, I'll turn it over to you for that point, and we'll continue working while you're discussing colonoscopy.

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THOMAS WIIG, MD, FACS: Thank you, Melissa. During recent polls, the public have been asked if there are things they can do to reduce or minimize their risk of getting cancer, and unfortunately, a great number of the public answered that they didn't really feel there was anything they could do to avoid or reduce the risk of getting cancer of one type or another. And the fact of the matter is, that simply isn't true. There are things that we can do in our lives that will reduce our risk of developing cancer or improve the chances of discovering an abnormality before it actually becomes cancer. We have a video that demonstrates and discusses the value of screening colonoscopy, and it involves one of our gastroenterologists at SMDC, Dr. Theresa Smith. Let's go to that video now.

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ANNOUNCER: The importance of screening for colon cancer is stressed at St. Mary's Duluth Clinic.

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THERESA SMITH, MD: Colonoscopy is a procedure where we look in the colon, or sometimes called the large intestine, with a flexible instrument. The scopes we use now have a video chip on the end of them and they project an image on a television screen so we can see where we're going. Our goal with colonoscopy is to get to the end of the colon and examine the entire lining of the colon, looking for polyps or other abnormalities. For colon cancer screening purposes, our goal is really to find and remove any polyps in the colon. It's thought that most colon cancers arise from polyps that are initially benign or noncancerous growths, but then they grow over time and can degenerate into a cancer.

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ANNOUNCER: Patients at St. Mary's benefit from the vast experience of the staff.

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THERESA SMITH, MD: We try and take a multidisciplinary approach to screening. We obviously involve our primary care physicians. They're the physicians who see the patients first and talk to them about their family histories and the need for colon cancer screening. We do have eight board-certified gastroenterologists on staff here doing many, many colonoscopies. We have a very large patient population, a large volume of procedures done here. We also have two genetic counselors on staff who can help us ferret out a family

history of colon cancer and appropriately direct genetic screening and testing if that's indicated.

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ANNOUNCER: All the staff at St. Mary's is involved in keeping patients aware of the importance of colon cancer screening.

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MELISSA NAJARIAN, MD: So this button here on my lapel represents the fight against colon cancer. By that I mean having your regularly scheduled colonoscopies.

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THOMAS WIIG, MD, FACS: I'd like to thank Dr. Smith for her comments. There are a number of avenues that a patient can take to get their screening colonoscopy scheduled. Many times it can be arranged through their primary care provider, but as Dr. Smith indicated, there are gastroenterologists in most larger communities that are very knowledgeable and experienced in performing colonoscopy. Dr. Lenz, you're one of the surgeons in our department that performs colonoscopy. What can patients expect when they go to get that procedure performed?

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JAY LENZ, MD, FACS: Well, we certainly review their history with them and find out why they're there to have the screening colonoscopy and make sure we know their family history and what their medical history is. We do a brief exam, examining their heart and lungs to make sure they can undergo an anesthesia while we do the procedure, which is a significant sedation while they're having the procedure done. Once we confirm that they're a good candidate for the procedure, then we go ahead and begin sedation and perform the exam. And it's done with them really not realizing what has been – what's been done to them. And we keep it as comfortable as possible, and most patients actually experience minimal discomfort and they wake up often asking us when we're going to start. And they usually have a little gas problem afterwards that they have to get rid of. We try to evacuate as much gas as we can during the procedure – or at the end of the procedure, but anyway, they end up with usually feeling pretty good by the – later on that day and often have no...by that evening. We can usually get a very good exam of their whole colon and biopsy things that look abnormal, take pictures and show them later those, and we send everything that we remove off to pathology. And I think it's a win-win experience for the patients because they—they find out if they're at risk for colon cancer, they found out if they have any other problems, and can seek out appropriate treatment based on that study.

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THOMAS WIIG, MD, FACS: Thank you for your comments. I would ask you, what can patients expect regarding the preparation to get ready for the procedure?

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JAY LENZ, MD, FACS: Well, they do have to do a bowel prep, which requires them being on clear liquids and usually drinking a certain amount, usually a half-gallon of liquid that's designed to clean out their colon, so it's a mechanical cleansing of the colon. And that's probably the most unpleasant part of the procedure, but once that's completed, the rest of it is really very straightforward. And most patients after they've completed it say, "Oh, that wasn't so bad." And I think that that's, you know – and we're getting better and better at giving them more things that are more easily tolerated, too.

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THOMAS WIIG, MD, FACS: I would point out that in our ongoing surveillance of our statistics here in the northern Minnesota region, as the incidence and numbers of colonoscopies have increased from year to year as patients have become more knowledgeable about the procedure and as we've had more providers available to perform the procedure, our numbers of colonoscopies have gone up. And interestingly enough, over the last several years the numbers of actual colon cancer operations has gone down because many times the colon – the precancerous colon lesions can be dealt with colonoscopically. So I'd like to

emphasize that this patient is on the table today because of having a screening colonoscopy finding a polyp before it actually turned into a colon cancer. So in this particular situation, a patient *can* reduce their risks of getting colon cancer. And if they *really* want to reduce their risks of getting colon cancer, I might say they should stamp out their cigarette, eat their bowl of oatmeal, and jog down to their friendly colonoscopist to set up their colonoscopy. I'd like to turn this back now to Dr. Najarian to see where she's gotten us in the operative procedure. Melissa?

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MELISSA NAJARIAN, MD: Well, we've been working away here, freeing up the large intestine from its attachments along the side wall of the abdomen. Here we can see the kidney back down behind there, and here we see the colon again. And go ahead and pull this back. Once we get it freely – fully freed up, then we'll be able to remove it from the abdomen. Here you can see some of the attachments of the colon to the other organs in its vicinity. And...it just takes a little bit of time and patience, and then we're able to get things freed up. The experience that these patients have in the hospital is that they'll spend on average about 3 to 5 days in the hospital after their laparoscopic surgery procedure, and then when they go home they have a few more weeks of recuperation, which in my experience with treating patients has been a lot less time for them to recuperate when they have the procedure done laparoscopically. I believe that is because they have had less – less invasive surgery, they have minimal incisions, and patients do very well with recovery. Perhaps, Dr. Wiig, you'd want to talk some more while we continue to free this up about our bowel pathway and how that has changed the experience that the patients have while they're in the hospital.

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THOMAS WIIG, MD, FACS: Yes, thank you, Melissa. First, I'll answer a couple of questions that have been sent in. I'd emphasize that there is a button on the website that you can click on to submit questions. We will attempt to answer as many of these as we can. Dr. Lenz, there's a question here from a listener who says, "Can this procedure be performed by any surgeon or physician, or does it require special training, and is it better to have it done by a specialist?" I know that there are a variety of physicians who may perform these procedures, and many of them are not necessarily considered as surgeons, but how many of these you perform is an important statistic.

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JAY LENZ, MD, FACS: Well, it certainly is. You want your surgeon to have done many of the procedures that he's planning to do on you. Obviously that's going to result in a better outcome. And in fact, if we're talking about laparoscopic procedures like this colon resection, many general surgeons and colorectal surgeons are trained to do this operation. And as long as the surgeon you're seeking attention with has done many of these operations, you should have a safe and good outcome with your operation. You certainly should ask your surgeon always if he's done this operation before, and how many has he done, and what kind of results he's had. It has to be a special interest to the surgeon to learn how to do this, and there are several courses we can go to, etc. to find out and perform these well.

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THOMAS WIIG, MD, FACS: And then in addition, as Dr. Smith mentioned, gastroenterologists can perform this. And in some communities where there might not be gastroenterologists or surgeons available there are occasionally primary care physicians who have been trained in this procedure also.

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JAY LENZ, MD, FACS: That's correct. For the colonoscopy, certainly gastroenterologists, general surgeons often have been trained. And we have – of the, I think, nine general surgeons we have here, four of us do a significant number of colonoscopies, and I think we do a very good job. And we understand the anatomy of the colon both inside and out, and

we certainly understand the disease process we're after and, I think, appropriately take care of the patients, as do the gastroenterologists.

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THOMAS WIIG, MD, FACS: To get to Dr. Najarian's question regarding our pathway, it's been known by most of us who take care of patients with colon cancer and other colon diseases that there are many things we can do to offer the patient an improved surgical and hospital product. We know that patients do better in their recuperation if they've been well informed and prepared for the surgery beforehand. This pathway that I'm talking about involves an assessment of the patient before the hospitalization; it involves education for the patient and their family about what to expect with regards to the surgery and the recuperation; it's been put together by RNs, by our surgeons, by our anesthesiologists; and it involves care of the patient while they're in the hospital and then coordinating their care after the hospital. We have a video that helps explain this pathway process, and I'd like to cut to that video now if we could, please.

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ANNOUNCER: The pathways program at St. Mary's Duluth Clinic is designed to educate patients about what to expect before, during, and after surgery.

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LICIA CONNOLLY, RN: For any pathway procedure at the Duluth Clinic, I think the underlying philosophy is that an educated patient has a better outcome. We believe in educating our patients for what the procedure entails, how it's carried out, how it will affect their body, and how their body may react to it, from a normal outcome to various complications that may ensue. We just feel like the more that the patient knows and understands, the better equipment they have to deal with it psychosocially, emotionally, and physically.

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ANNOUNCER: This emphasis on patient education and care has led to statistically proven shorter hospital stays, fewer complications, and better long-term outcomes.

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THOMAS WIIG, MD, FACS: After we initiated those pathways so that patients got a common amount of information, they got prepared optimally and they got managed similarly in the hospital, we have gone back and re-looked at the data and compared it with previous data. We've also compared it with the data that all Minnesota hospitals share through the Minnesota Hospital Association, and we know that we have improved our length of stays, we have reduced complication rates, we have reduced costs, and we have improved patient satisfaction surveys.

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THOMAS WIIG, MD, FACS (live): Our devotion to a quality care product for the patient continues throughout their surgical intervention. Let's return to the operating room now and see where Dr. Najarian is in the course of the procedure. Melissa?

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MELISSA NAJARIAN, MD: Well, we're still here, still freeing up the colon from its attachments. That's what keeps all our guts from falling out whenever we just roll around is all these attachments. And sometimes they can be somewhat tedious to take down. This is going along fine, but this is always the longest part of the operation is to remove these attachments so that the colon can become free and come out through small incisions.

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THOMAS WIIG, MD, FACS: Melissa, we've had a question submitted, "Why is there so much air space in the abdomen that is visible during this procedure? What does that accomplish?"

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MELISSA NAJARIAN, MD: Well, that's a very good question. The abdomen otherwise would be flat up against your intestines, but we have insufflated the abdomen, meaning pumped some air in that is carbon dioxide that helps raise up the abdominal wall and allow us to

see. Without that insufflation it would be almost impossible to get a window in order to see into the—whatever parts we're working on.

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THOMAS WIIG, MD, FACS: So the carbon dioxide, which is an inert gas, from the perspective of using your surgical instruments allows the organs to float apart so that you can accomplish your work with good visibility and safety.

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MELISSA NAJARIAN, MD: That is correct. And it's readily absorbed by the abdomen within 24 hours with few side effects to the patient.

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JAY LENZ, MD, FACS: Melissa, there's been a question about the gas you can see, that little smoke that you can see. Can you explain that to us a little bit?

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MELISSA NAJARIAN, MD: I'm sorry. I missed your question, Dr. Lenz.

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JAY LENZ, MD, FACS: There was a question that came through about the smoke you can see, or the mist. Do you want to explain that a little bit to viewers?

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MELISSA NAJARIAN, MD: Sure. That is just the—essentially the steam coming off of the instruments. The instrument that I'm using here uses a high frequency of sound waves, essentially, to divide and coagulate the tissue. It does create a bit of heat and steam, and that is what you see coming off in the abdomen here. That also readily dissipates and doesn't cause the patient any harm.

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THOMAS WIIG, MD, FACS: Thank you. How long does it take to prepare a patient for this type of surgery, Dr. Najarian?

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MELISSA NAJARIAN, MD: Um, just a day, really, and that is only to do bowel preparation, which is very similar to what is done for colonoscopy. And then, of course, they have to make sure that their physical condition, their heart and lungs and everything, is safe for undergoing surgery.

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THOMAS WIIG, MD, FACS: And when can the patient expect to resume bowel movements after the surgery?

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MELISSA NAJARIAN, MD: On average people resume bowel function about three days after the procedure. Everyone's a little bit different. Some people have bowel function within one to two days and other people's it takes more like a week. But on average it's probably three to four days.

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THOMAS WIIG, MD, FACS: We've had one question submitted about what factors might raise your risk of developing colon cancer. The question specifically relates to obesity. Does obesity raise the risk of colon cancer, and what other factors might raise the risk of colon cancer?

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MELISSA NAJARIAN, MD: Well, there are many factors that relate to the increase in colon cancer risk. Most prominently is a family history of colon cancer, colon polyps. Other things such as inflammatory bowel disease can raise your risk of colon cancer. Also hereditary syndromes. Smoking raises your risk. Thought of having a low-fiber diet raises your risk. To my knowledge, obesity hasn't been particularly linked to colon cancer but it may be indicative of an overall poor diet, which would likely raise your risk just due to lack of fiber in the diet.

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THOMAS WIIG, MD, FACS: So the issue of a healthy diet I think is important to emphasize. The diet that we tend to be subjected to in the United States is not really very healthy for our digestive tract as a whole. It tends to be quite bland, and it tends to be highly refined, and it tends to be high fat and cholesterol, and all of that raises the risk of some significant digestive issues, all the way from gastroesophageal reflux to gall bladder disease to colon cancer. So, Dr. Lenz, one patient has sent in a question here about whether or not most of these operations today are done laparoscopically or are they done still with surgery of the standard fashion using an incision, and what factors might lead you to choose one way or the other?

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JAY LENZ, MD, FACS: Well, that's a great question. There's really several factors that play a role in that, and they include the body habitus of the patient, how big the patient is, whether they've had previous surgery -- which is a very important thing because, as we know, surgery leaves scar tissue behind and that scar tissue can make an operation like this more difficult and lengthy and less safe. Other things that can happen would be the stage of the disease predicted preoperatively. In other words, if they have extensive colon cancer, laparoscopic or a minimally invasive approach might not be appropriate. Also, if they have had other coexistent conditions that could make it difficult. In other words, if they have problems with bleeding or if they have problems with, you know, if they're immunosuppressed for some reason. There are several reasons, other reasons, to avoid this type of surgery. We always try to do the best operation for the patients that seems to be will give us the best outcome, and if a patient sees me and they want an operation, I'll explain to them that I can't do the best operation but I'll get them to somebody who can, and usually one of my partners can do that, or occasionally we refer patients out of this system, but that's rare.

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THOMAS WIIG, MD, FACS: I'd like to point out that this patient -- in terms of your comments about scar tissue and previous procedures, this patient is getting this operation, or is able to get this operation, because he's been the beneficiary of a previous minimally invasive procedure. This particular patient has been operated upon in the past by our vascular surgeons here at SMDC. And the vascular surgeons performed a repair of an abdominal aortic aneurysm on this patient, and they were able to do it entirely endovascularly, which means two small incisions in the groin and inserting the new aortic graft from the inside rather than have to make an extensive incision. That—having had that surgery open with a large abdominal incision before might have meant that this particular procedure couldn't even be considered to be done with the laparoscope. I have a diagram here I'd like to help out with to show exactly kind of diagrammatically where we're at with this patient's procedure. Dr. Najarian has freed up the right side of the colon here. She's working across this area now to complete the freeing up. The polyps are located here and here. But notice that there are many structures that are quite close in relationship to the colon. The liver is here, the gall bladder is here, the pancreas and the stomach are here. These structures can also be involved with various disease processes, including malignancies. We can have primary malignancies in the liver, we can have malignancies that spread from various areas of the bowel to the liver. We have quite a comprehensive cancer service here at SMDC, and I'd like to move to a video that demonstrates the value of a multidisciplinary approach to the treatment of cancers. If we could move to that video, please.

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ANNOUNCER: St. Mary's Duluth Clinic Pathway Program includes its oncology department.

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STEVEN TENG, MD: Cancer care can be quite complicated. It -- it requires the coordination of different specialties for the delivery of both chemotherapy, surgical resection, and radiation oncology, and it's best when all those services can coordinate together at the

beginning and throughout that patient's care to design a treatment plan which is going to function most effectively in the best interests of that patient.

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ANNOUNCER: SMDC provides the best in cancer care in a setting second to none. From breast cancer, melanoma, colon cancer, to the more complex procedures such as surgical resection, radio frequency ablation, complex pancreatic procedures, and esophageal procedures, the emphasis is always on the patient.

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STEVEN TENG, MD: We participate in multidisciplinary tumor boards, where we coordinate with other services such as the medical oncology, gastroenterology, and radiation oncology services and developing treatment plans for patients with complex oncologic problems. We also have a multidisciplinary breast clinic where we use the same approach for patients with breast cancer. Every patient with breast cancer gets presented at this clinic and we formulate a plan for that patient's care so that we can deliver the finest and state-of-the-art care for these patients.

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THOMAS WIIG, MD, FACS: Well, thank you for those comments. I'd like to go to a couple of questions here. One question was sent in about what might be the length of time from the finding of a problem to the management of a problem, that is, from the diagnosis that there is in fact a problem until that problem can be managed. That length of time can vary a great deal. It can be as short as having a patient all prepared and getting their colonoscopy one day, and the surgeon gets a call from their gastroenterologist colleague explaining they've found a problem, the patient is prepped, and could they perform surgery the next day. So it could be as short as one day. And many times that's the case. We try our best to expedite the management of these patients for the sake of the patient's benefit, reducing their number of colon preparations they need to do, and so on, although many times there are issues that a patient might have with regards to either optimal medical – optimum medical preparation or dealing with family issues that might need to be squared away before they commit themselves to a significant recuperation time. So that gives you a little idea about the length of time that can be – that it can take. We might return to the operating room now to see where Dr. Najarian has gotten to with regard to the procedure, and I do have a couple of other questions, Melissa, that have come in, so let us know where you are and then I'll give you the questions.

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MELISSA NAJARIAN, MD: Well, I am just about done freeing up the colon from the inside part of things, and then once I have accomplished that then we can do what's called exteriorize the colon, meaning bring it out through small incision, and then finish the part of removing the colon outside the abdominal cavity.

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THOMAS WIIG, MD, FACS: Yes, one of the questions that came in was regarding freeing the colon up. You're removing the attachments to the colon that have been there naturally now. How do those attachments get reestablished after the colon has been removed?

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MELISSA NAJARIAN, MD: There's just some natural scar tissue that forms again after the colon has been freed up, and then it – excuse me a second here – it just seems to go back into its normal home and attachments.

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THOMAS WIIG, MD, FACS: Yes, thank you. I have a couple questions here related, Dr. Lenz, to what the risks of this surgery might be. There obviously, any time there are surgical procedures performed, there are risks, just like driving home in the car involves risk. We can't make surgery totally risk-free. Our education processes and pathway processes try to reduce risk, but patients have an interest in what the risks might be for this procedure.

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JAY LENZ, MD, FACS: Well, certainly that is one of our biggest concerns to make the operation as safe as possible. And the way that we do that is to explain to the patients that there's a small risk of infection after surgery, there's a risk of blood clots after surgery that form in your legs and can travel to your lungs and cause what we call a pulmonary embolism, which can be a very serious problem. Those two things are both handled by medications that are given in the perioperative period to prevent those things, and they work very effectively. The other things are that you can certainly have bleeding after an operation like this, and that we try to control as adequately as possibly in the operating room and monitor that after surgery to make sure there's not a bleed that happens after surgery that requires attention. Very few of these patients will require a transfusion, as you know, in our experience here. Other things that can happen: the patients can develop what's called an ileus, or a sleepy bowel that'll happen after surgery, requiring several extra days in the hospital until their bowel sort of wakes up. One way we prevent this is by giving pain medication in a way that affects the bowel less, and that's done through what's called an epidural catheter. Finally, things that can happen that we sometimes see are, like, internal hernias or scar tissue that happens right after surgery which can cause problems which require re-operation, including sometimes hernias that happen in somebody's incisions. That's one of the reasons that laparoscopic, or minimally invasive, surgery is so nice is because we virtually eliminate the risk of hernias after the operation.

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THOMAS WIIG, MD, FACS: One patient sent in a question about the possibility that the area where the bowel is reattached or hooked together, what happens if that doesn't heal together or if it comes apart?

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JAY LENZ, MD, FACS: Well, that's certainly a big problem, and we again do everything that we can to make that connection, which we call an anastomosis, as safe as possible. We check it in surgery to make sure it doesn't leak air or fluid, and then we monitor the patient for evidence of an infection or a leak. If that happens, we would re-operate on the patient almost immediately as soon as we discover that and we would have to repair that surgically, which would possibly even require a diversion of the bowel, including what's called an ostomy, for a short period of time. Fortunately, that happens rarely and we're usually able to avoid that, so that's one thing that we're very aware of and try to avoid.

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THOMAS WIIG, MD, FACS: You've mentioned some potentially fairly serious problems that can arise out of such an operation. What might be the statistical odds of this actually? You hear these potential complications, but in reality what are the numbers?

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JAY LENZ, MD, FACS: Well, the numbers, for instance, of pulmonary embolism are very small, I think less – well less than 1 in 1,000. I think things like heart attacks are rare after an operation like this with a good preoperative evaluation. Things like infection after an operation like this should be less than 10%. I think the numbers – the book would say even less than 25%, but I think our numbers are well less than 10% and probably more like 1% or 2% or significant infection. Sometimes wound infections – wound infections are probably more like 10%. But the rest of the problems are fairly rare in the less than 5% range, for the most part.

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THOMAS WIIG, MD, FACS: I'd like to point out that Dr. Najarian in the operating room now, what you're seeing here is the fact that this operation involves the removal of a fairly substantial segment of the patient's anatomy, that is, a segment of their bowel. A lot of laparoscopic procedures are done to either repair structures or remove small segments and don't require creation of an incision, but Dr. Najarian, you've now created a small incision in order to complete resection of the bowel. Is that what you've done?

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MELISSA NAJARIAN, MD: That is correct. And so, now, this is all the intestines that I have freed up. And here again is our appendix, our starting point, and then here is the colon, normally surrounded by fatty tissue like this, called the mesentery. And I've freed it all the way up and now I am bringing it outside of the abdominal wall, and I'm just going to free it up a little bit more in a few more places, and then we'll be ready to remove this segment.
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THOMAS WIIG, MD, FACS: Now, I might point out that you have made an incision, but it is a substantially smaller incision than you would have had to make if you did the whole procedure open, is that correct?
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MELISSA NAJARIAN, MD: That is correct. Yep, otherwise the procedure required for this, or the incision required for this, would be probably two to three times as long.
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THOMAS WIIG, MD, FACS: Dr. Najarian, we've had one question submitted as we watch you operate about would laparoscopic surgery be appropriate for some cases of adenocarcinoma of the rectum?
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MELISSA NAJARIAN, MD: Yep. It would be appropriate as well. Please put a clamp in there. Laparoscopic rectal surgery is somewhat more challenging than laparoscopic right hemicolectomies, but with experience in doing this, we can do that as well.
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THOMAS WIIG, MD, FACS: And in fact I know in your own practice you've performed laparoscopic removal of entire colons when the disease process indicated so.
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MELISSA NAJARIAN, MD: That is correct. The techniques may vary but all involve using smaller incision than has been traditionally been performed.
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THOMAS WIIG, MD, FACS: Dr. Najarian, when you perform the anastomosis in this case will you be using other specialized instruments?
00:37:41

MELISSA NAJARIAN, MD: Yep, we'll be using surgical staplers, which have been helpful in that they speed up hooking together the colon. But you can also use sutures, which both have been shown to be good for putting the parts back together. Okay, so...this up here.
00:38:08

THOMAS WIIG, MD, FACS: Yeah, you've got quite an extensive area freed up.
00:38:12

MELISSA NAJARIAN, MD: Yep. So now I'm just trying to select the place that will be to put the colon back together. I've freed up a piece through here, and then I will have to free up another major blood vessel around this area, and then select a place on the small intestine, and then hook the two pieces together and remove the whole right side of the colon. We'll go right here.
00:38:42

THOMAS WIIG, MD, FACS: We have a question about the carbon dioxide used. Carbon dioxide is infused from a gas canister under a certain pressure so that the abdomen is inflated but there isn't too much compression applied to the other abdominal organs. The nice thing about the use of carbon dioxide is in fact that it is an inert gas; that is, it doesn't react to the cautery and doesn't offer any dangers or risks of explosion. It also is a gas which is very diffusible in the body, so the body tissues pick it up quickly and remove it via the bloodstream and the patient's respiratory functions afterwards.
00:39:30

MELISSA NAJARIAN, MD: That is correct. Harmonic, please.
00:39:32

THOMAS WIIG, MD, FACS: We've had a question, Dr. Lenz, about when should somebody start the issue of colonoscopy screening. When in their life is it important to look at that potential problem?

00:39:44

JAY LENZ, MD, FACS: Well, certainly the standard answer to that is at age 50 you should have your first screening colonoscopy. That's a very good idea to start at age 50. If there's a family history of colon diseases that predispose you to colon cancer, you should certainly have that sooner. If you have a relative that has had colon cancer at age, say, 45, you should probably have your first colon cancer at age 35, 10 years before that tumor appeared, which is unusual, but we do see patients like that. If they have – if there's evidence of inflammatory bowel disease, they'll certainly have had a colonoscopy sooner than that. If they have other problems like family history of polyposis or other tumors that can also increase the risk of colon cancer, they should have it sooner. So you should talk to your doctor carefully, but age 50 is the minimum age, and certainly everyone should have one by age 50.

00:40:36

THOMAS WIIG, MD, FACS: And the frequency would be...

00:40:37

JAY LENZ, MD, FACS: Again, depending upon the risk factors for the patient. If they have their first one at age 50 and it's clean, they could be told to come back in 10 years or 5 years, and that depends upon the surgeon or the doctor who did the procedure, how adequate he thought the procedure was, and how he assessed your family risk factors. If he thought the procedure went very well and was very confident that you're at low risk, he wouldn't offer you a colonoscopy for 10 years. Some people get them every 3 years, depending on these extenuating circumstances.

00:41:08

THOMAS WIIG, MD, FACS: Yep, very good. We've had a question about colon ischemia, a comment on colon ischemia. Colon ischemia can occur as a primary issue or problem related to reduction in blood flow to the colon. There are certain conditions that can predispose to that. One of them might be vascular disease, another might be high pressure situation in the abdomen that reduces the blood flow to the colon. It is not a common problem and fortunately for patients is usually one that is—that doesn't always require surgical resection. If the colon ischemia is severe enough so that the segment of colon is irreversibly damaged, then that segment of the colon would need to be surgically removed and gotten back to an area of bowel on either side that did have good blood supply. Dr. Lenz, we've had a question about what is the incidence of recurrence of colon cancer, and once someone has had a diagnosis of colon cancer does that change how they need to be followed?

00:42:23

JAY LENZ, MD, FACS: Well, it certainly does, and that has to do with the age of the patient and the extent—how extensive the disease is at presentation and what were the predisposing factors for the tumor. Patients that have had a colon cancer operation should certainly have another colonoscopy, another study of their colon with a scope, within a year of their operation. And if that's clean, they may not go again for another three years, but they often will repeat that for the first two or three years after the operation, then go to every three years surveillance.. If in fact they are at higher risk for developing more tumors because of the extent of the disease or another predisposing factor, they'll probably have pretty frequent colonoscopies.

00:43:03

THOMAS WIIG, MD, FACS: I'd like to go back to my diagram here, now, for a moment, if I could. We've had a question about what is the root, or the pathway, of a colonoscopy. This being the lower rectal opening, the colonoscope is a flexible instrument nowadays, and it would be inserted here, it would traverse this area, which is a bend in the colon called the sigmoid colon, it would rise up through the descending colon here, pass through the

transverse colon, and go all the way down to the tip of the secum here. So we're talking about a total distance there of several feet, and the procedure needs to be done carefully and with a good concept of visually examining every nook and cranny of the colon to make sure that polyps haven't been missed or other problems haven't been missed. So that would be the pathway of the average colonoscopy. It does involve inflation of the colon so that, again, the colonoscopy performer can see the entire aspect of the colon for its entire circumference and its entire length, and that leads to some of the gas cramping after the procedure that Dr. Lenz alluded to, although there's a very sincere effort on the part of the colonoscopist to try and remove the gas as the colonoscope is removed. The – another reader sent in a question about are these colon surgery procedures ever performed robotically? Dr. Najarian, would you have a comment on that?

00:44:45

MELISSA NAJARIAN, MD: Not to my knowledge around the country. At our society of colorectal surgeons, there's not been a big interest or ploy for doing them robotically. I think at this point, people are sticking with the straight laparoscopic technique rather than robotics.

00:45:04

THOMAS WIIG, MD, FACS: Yes, and we've had one question about recurrence of colon cancer as it relates to the laparoscopic approach. I know that initial learning curves when laparoscopy was very first being used for this procedure, it was thought that there might be an increased risk of colon cancer, either recurrence or persistence, if the procedure was performed laparoscopically, but as experience has been gained with the procedure, as knowledge has been gained about the techniques, and the knowledge – and the instrumentation has involved, I think there is no increased risk of colon cancer persistence or recurrence if the procedure is done laparoscopically. Would you agree with that, Dr. Najarian?

00:45:57

MELISSA NAJARIAN, MD: Yes, I do agree. There was a large study headed up by Mayo Clinic Dr. Hayden Nelson called the call study that determined that laparoscopy is as safe as open surgery is for treating colon cancer. And that has finally put to rest the issue of whether or not laparoscopic colon surgery is safe. What I am currently doing now here is about to remove and repair – or reassemble the colon. I have made a small hole in the colon on this side and a small hole in the small intestine on that side, and I'm sliding a surgical stapler down each side. And you just have to take a second here to get it set just so. And this creates a common channel down the intestines and puts them together. It's like welding them together, essentially. And I'll take a reload and some Alice and Babcocks. And then we'll take another load of the stapler and we'll complete the resection, and then we'll be close to finished, actually.

00:47:15

THOMAS WIIG, MD, FACS: Dr. Najarian, somebody sent in a question saying during the laparoscopic portion of your procedure things looked really quite normal and I must say aesthetically pleasing, but now once it's outside on the front of the abdominal wall there, it does appear more red and bloody. Do you have any comments about the difference in appearance?

00:47:39

MELISSA NAJARIAN, MD: No, I don't have much comment about the difference in appearance other than it probably looks just more up close and personal on the outside.

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THOMAS WIIG, MD, FACS: Yes, I understand your comments there. I think that one must understand that in the laparoscopic view, we're looking at somewhat of a magnified view, we're looking at it closer in, and there's a gas pressure of about 15 mm mercury that the abdominal cavity is inflated to, and so there is a little bit less oozing with that gas pressure. Once the gas pressure is relieved by the bowel being exteriorized like this, then there would

be a little bit more oozing. I'd also say that color accuracy of the digital imaging might make this appear a little bit more red than it actually is, and if you actually quantified the amount or volume of blood that would be contained there on the surface of the abdominal wall, it wouldn't really be all that much, although it looks a little impressive when you see it from the surface.

00:48:46

MELISSA NAJARIAN, MD: So here I'm taking the final steps to remove the colon. And we'll put this in the pan here. We can show you a little bit more what it looks like. Can I have the suture scissors?

00:48:59

THOMAS WIIG, MD, FACS: So you've removed the specimen and that's it in the specimen pan there.

00:49:03

MELISSA NAJARIAN, MD: Yep. We'll just separate things from the staplers. Here's the end part of the small intestine right here...coming into - here's our appendix. Remember, we started there. Here's the large intestine here. All the way up. This is the whole right side of the large intestine. So right now we are going to change a pair of gloves since we had open intestines on the field. We'll pass that off. And then we will complete the rest of the procedure as we tidy up a bit.

00:49:33

THOMAS WIIG, MD, FACS: Dr. Lenz, we've had a question about can laparoscopic colectomy or, in fact, open colectomy be done for what might be called redundant bowel or lazy bowel?

00:49:48

JAY LENZ, MD, FACS: It certainly can be. There's some people that do have a colon that doesn't function normally and actually it seems that it just won't push the - its contents downstream, and the patients end up with sort of a functional obstruction there. And we do colon resections for that reason. That could be done by either method. Sometimes the colon gets very large by that method - or by that disease process, and it could require a fairly large incision to remove it. And if that's the case, it may not be very beneficial to remove it by that method, just because of the incision required to remove it anyway - actually exteriorize the bowel.

00:50:23

THOMAS WIIG, MD, FACS: Thank you. We do have many other procedures that are available to be done nowadays with this minimally invasive approach. Not every operation is possible to be performed that way, as we've discussed a little bit already, but one of the more common ones that's done nowadays in this country is obesity surgery. And we do have a bariatric, or obesity surgery program, and I'd like to go to a video that discusses that a little bit now, please.

00:51:03

WALTER MEDLIN, MD, FACS: A lap band procedure is a procedure done with laparoscopic approach where we use a small TV camera through a very small incision and we fill the abdomen up with carbon dioxide, much like we do with laparoscopy for any type of procedure. And we are able to put small instruments through some other small ports and access the top part of the stomach. And the band part of the procedure we have a little tool called a lap band that we put around the upper stomach and secure it in place around the upper stomach, and then bring out a thin piece of tubing to just under the skin on the abdominal wall, and that allows us to adjust fluid inside the band. There's a little balloon inside the band that with fluid adjustments can be tighter or looser around the upper stomach, and that helps control feeling of fullness after meals and between meals and lets people eat a lot less but feel just as full as if they had eaten a lot more. We have people, though, not mix liquids with their meal. They take their liquids at a separate time so that that food goes through a little slower, gives them a feeling of fullness. We have people take more high-protein food that increases their feeling of fullness. And also, if they feel full after

just a few bites of food and they don't have any protein, they can actually have malnutrition problems. We have everyone get on an activity program. They don't have to become athletes, but to have regular daily exercise is a very important – first of all, to manage that feeling of fullness but also for long-term health, daily activity is as important as where the actual scales are. You can make adjustments lifelong on the band after that if somebody has a need in later years, if they become pregnant or have another illness where they need to have more calorie intake then we can take some fluid out of the band so they can eat more. On the other hand, if people get used to where the band is and are getting hungrier, we can put more fluid in. So we can adjust that over time, and it's a lifetime procedure. The band stays in forever, so it's always adjustable.

00:53:17

THOMAS WIIG, MD, FACS: Well, I'd like to thank Dr. Medlin for those comments, and now let's return to the operating room to see what stage the operation has gotten to at this point. Dr. Najarian?

00:53:29

MELISSA NAJARIAN, MD: So, yes, we're back and we've removed the specimen, as you recall. And then now here are our two crossing staple lines. And here I can pinch my fingers, and then now the intestinal contents will come from here in the small intestine and that will flow freely into the large intestine. And we have completed our anastomosis, so we're going to put it back inside the abdomen, take a look, and make sure everything looks okay. All looks fine. So then we'll take our wound protector out and we'll begin to close. Can I have two trocars, please?

00:54:05

THOMAS WIIG, MD, FACS: Dr. Najarian, we had a question about the fact that the colon does have a function in the body. That is, it is involved with the reabsorption of water and other nutrients, and the questioner wonders what happens when part of the colon is removed. Are there bodily deficiencies that are possible?

00:54:29

MELISSA NAJARIAN, MD: The right colon's particular job is to absorb some salt and chloride, but yet without it your body learns to adapt and functions normally. Your small intestines can take over the job or the remaining part of the large intestines can take over the job. So you can actually live a normal life without any amount of colon at all, though certainly your bowel habitats afterwards would be quite different.

00:54:55

THOMAS WIIG, MD, FACS: Yes, and would this surgery require any kind of a special diet postoperatively. Dr. Lenz?

00:55:04

JAY LENZ, MD, FACS: Well, initially the patient will notice – you know, we'll start them on liquids, what we call full liquids, while they're still in the hospital. But after they're discharged to home, they should be able to eat normally. They should have relatively normal bowel movements. They may lose a little more water in their bowel movements initially, but that's minimally. It has a minimal effect, and usually they're back to normal eating relatively certainly within a week or so after getting home.

00:55:28

THOMAS WIIG, MD, FACS: Yep. Very good. Dr. Najarian, I noticed that you're now using sutures to close the muscular tissue of the incision there. What would be left with the rest of the procedure from your perspective after this point?

00:55:41

MELISSA NAJARIAN, MD: After this point it's just a matter of closing up the skin and then the procedure is essentially finished.

00:55:51

THOMAS WIIG, MD, FACS: From the completion of the operation from your perspective, then, the patient then has dressing applied and leaves the operating room to go to the recovery room. Anything further in the next few days from your perspective?

00:56:08

MELISSA NAJARIAN, MD: He'll begin to start ambulating, meaning walking around. That's very important to prevent postoperative surgical complications. He'll begin starting on a liquid diet starting tomorrow. We used to wait until they started to pass gas before starting them on a diet – next suture, please – but now we've found that actually they do better with early feeding, meaning starting right after surgery. It's easier on their stomach and their bowel function returns a little bit sooner than having to wait until they start passing gas.

00:56:46

THOMAS WIIG, MD, FACS: Very good. I'd like to thank you, Dr. Najarian, for allowing us in the operating room with you. I know that that can be a little additional challenge to any operative procedure. I appreciate you and your team's commitment to this project. Thank you very much.

00:57:01

MELISSA NAJARIAN, MD: Well, thank you for joining us, and I hope that everyone remembers to go get their colonoscopies.

00:57:06

THOMAS WIIG, MD, FACS: (chuckles) Very good. Dr. Lenz, I'd ask just briefly, we mentioned in the video that we do have other laparoscopic or minimally invasive procedures, such as the lap band procedure. How can patients get more information about that kind of procedure?

00:57:25

JAY LENZ, MD, FACS: Well, they certainly can talk to their doctors, who should be able to get them the information. The doctors can refer them to us if they have questions about certain procedures. We certainly do, or offer, a full list of laparoscopic or minimally invasive surgeries, including hernias; splenectomies; adrenalectomies; gall bladders, or cholecystectomies as we call them; and appendectomies are five common operations we would do laparoscopically, as well as of course the bariatric surgery, including the Roux-en-Y gastric bypasses and the lap bands. So we have a full service and we also offer other departments -- of course, other departments offer kidney removal that way, etc.

00:53:01

THOMAS WIIG, MD, FACS: And with regard to the lap band, or bariatric, or weight loss surgery, we do have information sessions, we do have information hotlines, we do have specialized nurses who can answer any of their questions and would be happy to see patients at any time.

00:58:17

JAY LENZ, MD, FACS: Absolutely.

00:58:18

THOMAS WIIG, MD, FACS: We'd like to thank you for being with us tonight at St. Mary's Medical Center operating room, component hospital of SMDC. I'd like to thank the OR-Live staff and their support people who have helped bring this project to completion. There are many people that have been involved in this project to give us an opportunity for patient education and exposure of our services that we allow to patient—that we offer to patients in northern Minnesota, so I'd like to give every one of those people my own personal thanks, and I'd like to thank you for viewing and have a good evening. Thank you very much.

00:58:56

ANNOUNCER: Thank you for watching this laparoscopic hemicolectomy from St. Mary's Medical Center in Duluth, Minnesota. To require more information or make appointments, press the appropriate buttons on your screen. St. Mary's Duluth Clinic, the soul and science of healing.

00:59:22
[END OF PROGRAM]