ENDOSCOPIC ULTRASOUNOGRAPHY AND ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY WAKE FOREST UNIVERSITY BAPTIST MEDICAL CENTER WINSTON-SALEM, NC

00:00:02
ANNOUNCER: Welcome to Wake Forest University Baptist Medical Center in Winston-Salem, North Carolina. You're just moments away from a live endoscopic ultrasonography, and endoscopic retrograde cholangiopancreatography. Dr. Jerry Evans will perform these procedures under a single sedation, as doctors John Baillie and Girish Mishra will moderate. The procedures will utilize an endoscope to examine the lining of the walls of upper and lower digestive tracts, as well as diagnose and treat problems involving the bile ducts, gall bladder and pancreas. ORLive makes it easy for you to learn more. Just click on the 'Request Information' button on your webcast screen, and open the door to informed medical care. Now, let's join the doctors.
00:00:50
GIRISH MISHRA: Good afternoon. My name is Girish Mishra and this is my colleague, Dr. John Baillie.
00:00:55
JOHN BAILLIE MB ChB, FACG, FASGE: Thank you, Girish. Pleased to be here. Dr. Mishra is our director of endoscopy and also director of our endoscopic ultrasound program here at Wake Forest University Baptist Medical Center. Girish did his training in gastroenterology at Gainesville in Florida and then spent time at the Medical University of South Carolina in Charleston learning this very specialized technique of endoscopic ultrasound. And you've been here what, seven years?
00:01:13
GIRISH MISHRA, MD, MS: Yes, John, thank you. And if you haven't gathered by the accent, Professor Baillie originally hails from Scotland and is an international expert in pancreatic disorders as well as the procedure we're going to do, ERCP, which is endoscopic retrograde cholangiopancreatography. And so, today is a very unique day -- special day -- in that we're going to have a wonderful case of a woman in her middle age who presented several weeks ago with increased liver enzymes, slightly jaundiced, meaning yellow. And at the outside facility, she had an attempt at ERCP, a procedure that allows us to visualize and actually gain access to the bile duct. Unfortunately, the gastroenterologists were unable to gain access to her bile duct, and therefore, she presents to us here today. And we'll go through this case in detail in terms of why we do the procedure, and what it offers for the patient. So, what I'm going to show is a... switch over to a PowerPoint schematic. Here is the pancreas. And you can see, this entire organ here is the pancreas, and the procedures that we're going to show today -- the endoscopic ultrasound and ERCP -- are used to better visualize this area, and the bile duct would be in this area. So, we'll now show the procedure. My colleague, Dr. Jason Conway, is an assistant professor of internal medicine and gastroenterology, and has done special training in endoscopic ultrasound. Trained -- did an extra year of special training -- at the Medical University of South Carolina in Charleston.... Yes. Okay. So, he's getting ready to put the scope into the patient's mouth and esophagus, down into the stomach, to get a better visualization of the pancreas and bile duct.
00:03:37
JOHN BAILLIE MB ChB, FACG, FASGE: I might mention that we do many of our procedures with the support of our anesthesia providers, either under general anesthesia or under what we call MAC, which is monitored anesthesia care. And that allows us to do a lot more, because the patients are truly asleep. And often, we combine the endoscopic ultrasound and the ERCP tests. I think it's fair to say that a common complaint we have from patients who come, having had these procedures attempted elsewhere, is that they wake up in the

middle of the procedure. And that's part of the problem with so-called conscious or moderate sedation, and it's hard to keep people asleep for long periods with that kind of sedation. So it's one of the advantages -- I think we have, here, Girish, at Baptist, that we can really get the people asleep, and that allows us to do things when they're not moving. And we're really aiming at a very small target, here. So let's go back over, see what Dr. Conway's doing.
00:04:38
GIRISH MISHRA, MD, MS: That's an excellent point, John. The ability to do intricate movement really depends on the patient being very comfortable and adequately sedated, and we're very fortunate to have our anesthesiologists pretty much throughout the day to tackle all our procedures and challenges that we face in the endoscopy unit.
00:05:04
JOHN BAILLIE MB ChB, FACG, FASGE: All right. Just take a few moments and talk about what we might expect to see here. Patients get jaundiced for a whole lot of different reasons, and one of the things that makes managing liver and bile duct disease interesting is working out where the abnormality is. And there are certain things that point us to mechanical obstruction of the bile duct. The bile duct is a tube that runs from the liver into the intestine a few inches beyond the stomach. And it empties through a little nipple that we call the papilla or the ampulla. And we can visualize that system with a variety of imaging ranging from ultrasound to CT scans to MRI scans. So before we ever get to the stage of doing the kind of specialized procedures we're doing today, we have a fairly good idea of what the plumbing looks like. And if the bile duct is enlarged or what we call dilated, it's a little smoking gun -- little red flag -- that maybe there's a mechanical obstruction to flow of bile.

So what kind of things would we think of as obstructing the bile duct? The commonest is stones; gallstones are extremely common. It's a disease mainly of western countries, so in the U.S. we have a lot of it. Over half a million people a year have their gall bladders out in this country for stone disease. Ten to 15 percent of them will have a stone or stones in the bile duct at the time of the surgery, and you can also form stones after gall bladder surgery and I think I'm right, Girish, in saying this lady's had her gall bladder out in the past.
00:06:45
GIRISH MISHRA, MD, MS: Correct.
00:06:46
JOHN BAILLIE MB ChB, FACG, FASGE: So just the fact that you've had your gall bladder out doesn't mean that you can't have a stone. And so you can either have a stone that perhaps slipped into the -- the bile duct at the time of the surgery, or if it's years later, you may just make a whole lot of new stone material -- junk -- in your bile duct. So, we certainly think about stones. Depending on the age of the patient, we also think about tumors and malignancy is a lot of our work. That little nipple or ampulla that the bile empties out can become obstructed with tumors. The commonest tumor we see is a tumor of the... the head of the pancreas. The bile duct runs down through the front part of the pancreas -- what we call the head of the pancreas -- and if we go to the PowerPoint presentation, Girish can show you how we look at this with endoscopic ultrasound. So we could flip over for a moment, Girish will just tell us what he does if he has a EUS scope and we see a mass in the pancreas.
00:07:44
GIRISH MISHRA, MD, MS: Thank you, John. That was very nicely summarized. Fortunately for us and our patients, the stones do comprise the major cause for jaundice or blockage in the bile duct. But unfortunately, as gastroenterologists and subspecialists that deal with disorders of the pancreas or the biliary tract and bile duct, often there are other causes, namely, that of a pancreatic mass or cancer. And that will block the bile duct and cause the patient to turn yellow or jaundice. So, you can see from this schematic, here, that this is

our endoscope. This is called the echoendoscope or endoscopic ultrasound. And right -- in this particular schema, the scope is sitting in the stomach, and the pancreas lies just underneath or posterior to the stomach, so we're able to actually visualize what the endoscopic ultrasound, the entire pancreas -- this would be called the body of the pancreas; this is the tail of the pancreas; and this is the head of the pancreas. We're able to visualize the pancreatic head with the scope traversing through the stomach into the first part of the intestine, right about so. From this orientation, we can see the bile duct going this way. Sometimes there will be a plastic stent to help drain the bile duct. If a more permanent fixture is needed, or drainage, then one can place a metal stent. And we have some diagrams to show that later on in the broadcast. But you can see very nicely and why this procedure is so useful for visualizing the pancreas, right here. We're literally millimeters away from the area of interest. Now, in this patient, we don't expect to find a mass in the pancreas, but if there were a mass in the pancreas, that's what it would look like, and we're able to do a needle biopsy and get tissue. Okay, so let's switch over and have my colleague, Dr. Conway, demonstrate to you, in a patient, what he's seeing.
00:10:00
JASON D. CONWAY, MD, MPH: Well, thanks, Girish and John. That was a -- an excellent explanation of both obstructive jaundice as well as the basics of endoscopic ultrasound. What I'll show you today is sort of a basic examination using the endoscopic ultrasound probe. We'll be looking primarily at the pancreas, but we'll see the adjacent structures. We'll be focusing on the bile duct, as well, as this patient had a history of abdominal pain and elevation of the LFTs, and one of the questions is, is there anything in or obstructing her bile duct. I'll start the exam where we start all of our exams, which is by inserting the scope down into the stomach. We're down just at the very beginning of the stomach, right where the esophagus -- the swallowing tube -- and the stomach meet. The first thing that we see when we push the tip of the scope against the wall of the stomach is -- is the liver. That's the structure that you're seeing down below me, or down below the transducer. Our scopes have Doppler capabilities, so you can see that... the area which is red is actually a blood vessel where there's flow of blood within -- within this blood vessel. And all this tissue, right here, where the cursor is, below me, is actually the liver.

Now we move on to the -- to the next part of the exam where we'll... we'll look for what's called the aorta. The aorta's the major blood vessel which supplies blood to... to the majority of the body. The aorta is this linear, anechoic or very dark black structure immediately beneath the transducer. And you can actually see the -- the red of the -- the Doppler showing the flow of the blood within the aorta.
00:11:52
GIRISH MISHRA, MD, MS: So Jason --
00:11:53
JASON D. CONWAY, MD, MPH: And this is all about finding landmarks. It's -- it's a little challenging, as you might imagine, sometimes, to know exactly where you are, so we always find landmarks and follow them to other landmarks. So, after I found the aorta, the thing that I looked for is the structure that's immediately beneath the transducer, here, which is the crus of the diaphragm, which lays right on top of the aorta. Right beneath that is the first artery that comes off of the aorta after the aorta becomes abdominal, and that is what we call the celiac artery. Right where the crosshair is, there, I'll label C-E-L. And again, this is the aorta, down here.
00:12:34
GIRISH MISHRA, MD, MS: So Jason, this is a beautiful anatomy. I think you're doing a... it's a great demonstration of what endoscopic ultrasound allows us to see in the pancreas. Are there other areas besides the pancreas that you use endoscopic ultrasound for?
00:12:51
JASON D. CONWAY, MD, MPH: Sure. The... we will frequently use -- at the end of the case, I'll try to show you [indistinct]. But we can see anything that is within about four or five

centimeters of the -- of the GI tract. Where we can get the transducer down into is what we can see. So, while most of the work that we do here at Wake Forest is looking at the pancreas, we could also look at the bile duct, the majority of the liver. We can biopsy needles which are in -- we can biopsy, I'm sorry, lymph nodes, which are in the chest. We can also insert the scope into the rectum, and what we do there is staging a lot of rectal cancers.
00:13:33
GIRISH MISHRA, MD, MS: Excellent. Well, I think, since the million-dollar question in our patient is, is there a stone or is there not a stone, and what exactly is in the bile duct, can you answer that question for us and show us?
00:13:47
JASON D. CONWAY, MD, MPH: Sure. The first thing I'm going to do is -- is follow the celiac artery, here, which, again, is right below me, to the body of the pancreas, which is now immediately beneath the transducer, and I'll -- I'll zoom in on that a little bit. This tissue in here is -- that I'll sort of highlight with the crosshairs, here -- this is all of the... this is all the -- the body that the [indistinct] or the tissue of the body of the pancreas. This little, this small little dot here in the center, is actually her pancreatic duct, in the body of the pancreas, which is very small, about 0.8 millimeters. Anything less than about two centimeter-- two millimeters, I'm sorry -- or less, is... is normal.
00:14:28
GIRISH MISHRA, MD, MS: Can you tell if there's been any damage to the pancreas?
00:14:31
JASON D. CONWAY, MD, MPH: That's a good question. One of the -- one of the powers of... or one of the strengths of endoscopic ultrasound is our ability to gain these really high-resolution images of the pancreas. And you can see -- while I'm showing you this pancreatic duct here -- you can see that if this -- if there was even a very small lesion within the pancreas, we'd be able to see it quite clearly. What we use the endoscopic ultrasound for a lot is diagnosing what Girish was referring to which is chronic pancreatitis or -- or inflammation in the pancreas. And there are very -- certain characteristics that we look for, which are primarily caused by ongoing inflammation and scarring in the pancreas. This patient -- fortunately for her -- has a pretty normal-appearing pancreas, actually. The... the parenchyma is quite homogeneous, in that it is all... this very typical salt-and-peppery echo texture. There aren't any -- any abnormalities that really stand out within -- within this tissue at all. So, this patient, I believe, her pancreas, from what I've seen here -- certainly, the body and the tail -- looks... looks quite normal.
00:15:49
GIRISH MISHRA, MD, MS: So that's a wonderful demonstration of the... body and tail of the pancreas. Dr. Conway, can you now go to the head of the pancreas, because that is the area of interest, and show us what the bile duct looks like, whether there's a mass, whether there's stones, that would be very informative for us.
00:16:08
JASON D. CONWAY, MD, MS: Sure. In order for me to image the head of the pancreas, we have to advance the scope into the duodenal bulb. So we have to advance the scope deeper into her stomach, and into the duodenal bulb which is the very first part of her small intestine.... Okay. Now, the scope has been advanced into her duodenal bulb, and I think we're going to get some really nice images here. Let me stop, or just sort of freeze the image right here, after I put the Doppler on to show everybody what we're seeing.... So, this is a pretty classic image of what we see when we're looking at the head of the pancreas. I use the crosshairs, here, to kind of demonstrate what I'm looking at. The first structure is black or anechoic structure that's closest to the transducer which is this sort of semicircle here at the top of the screen. This is actually the common bile duct, and this is how bile or digestive juices get from the liver down into the small intestine. Right behind the bile duct is this larger anechoic structure, that's actually a valve for [indistinct] to flow in

this structure. This is actually the portal vein. This is how most of the blood gets into the liver. This tissue that's over in here, where the... where the crosshairs are now is actually the pancreas head. And what I'll measure here is actually the pancreatic duct in the body of the pancreas.
00:17:39
GIRISH MISHRA, MD, MS: So, Dr. Conway, are you seeing a mass in the pancreas, or no?
00:17:44
JASON D. CONWAY, MD, MPH: What I've seen so far, this actually looks quite normal. I don't see any evidence of inflammation or chronic pancreatitis, and the brief images I've gotten of the bile duct look normal as well, but I've -- I've just sort of, just begun the exam. EUS is a very dynamic imaging modality, so it requires finding a structure, and then maneuvering the scope so you're standing over the structure multiple times and in multiple plains, because we're using a two-dimensional imaging modality to image what, really, are three-dimensional...
00:18:18
GIRISH MISHRA, MD, MS: Now, Dr. Conway, I did not see evidence of stones in her bile duct on the brief... briefly in your wonderful demonstration. Now, she very well could have had stones that migrated down her bile duct, and passed, so that makes a clinical decision challenging: did she have stones and will she form stones again and what should we do about this.
00:18:42
JASON D. CONWAY, MD, MPH: Sure. What I -- what I'm trying to do now is, just trying to get better images of... of the bile duct. And what I want to do is be sure that I examine the entire bile duct, from where the bile duct empties into the small intestine. And that's right where I'm looking right here, and I'll keep the Doppler on so you can see the portal vein which is pulsating with that red Doppler flow behind us. And the bile duct, which I'm going to try to keep right beneath the transducer, right where the crosshairs are. And, as you'll see -- as I torque a little bit to the right, here -- you can see that the bile duct and another black structure come very close together. And that's actually the pancreatic duct. So, where these two ducts come together and meet right about here, this is where the two structures actually enter into the small intestine. So I know that that is the... what we call the very most distal aspect of the bile duct. And then, as I try to keep the bile duct beneath the transducer, and I'm torquing sort of counter-clockwise now --
00:19:39
GIRISH MISHRA, MD, MS: Excuse me, Dr. Conway. Just by my eye, from a distance, it does appear that the bile duct is slightly dilated. Again, I'm not -- I don't have the ability to measure, which you can. But just from looking over here, it appears to be somewhere in the six- to eight-millimeter range, which would suggest that perhaps there's some chronic obstruction, and she might benefit from an ERCP with sphincterotomy.
00:20:03
JASON D. CONWAY, MD, MPH: Sure. Her -- her -- her bile duct, here, does measure about eight millimeters or so, which is what I'm measuring right now....
00:20:08
JOHN BAILLIE MB ChB, FACG, FASGE: Jason, John Baillie here. Some of our viewers may not be familiar with the term 'Doppler,' or they may have heard it --
00:20:16
JASON D. CONWAY, MD, MPH: Sure.
00:20:16
JOHN BAILLIE MB ChB, FACG, FASGE: -- on the weather forecast. Is there a storm coming, or can you tell us why we're using 'Doppler' as part of your test?
00:20:22
JASON D. CONWAY, MD, MPH: Well I -- I've been told that EUS images do look a lot like a hurricane map at times. And believe me, it takes a little while to understand exactly what

you're looking at. But, what Doppler does is it actually measures flow, so it measures -- it measures flow coming either towards or away from the transducer. And that is interpreted by the processor, and expressed on the screen as color. So, what we're seeing here is flow, represented by the color or the red here, in the portal vein, and up above that, in the bile duct, where there's relatively no flow, we're seeing a Doppler-negative, anechoic or black structure, so there's no flow there. So, again, Doppler helps us identify where there's flow in a structure, and helps us discriminate between what might actually be, say, in this case, the bile duct versus the portal vein.
00:21:18
JOHN BAILLIE MB ChB, FACG, FASGE: That's a very nice explanation about a difficult concept. One other question for you, Dr. Conway. There's a lot of interest, now, in the role of what we call sludge in causing symptoms and complaints that we used to think were due to stones. Can you tell us what bile duct sludge is, and how you would recognize it?
00:21:39
JASON D. CONWAY, MD, MPH: Sure. Bile duct sludge -- and this patient, of course, has had her gall bladder removed -- but gall bladder sludge looks like what we call a starry night appearance. And what that is, is the gall bladder, of course, being full of bile, will be a large bla-- sac, almost, on the ultrasound screen. And what you'll see within that sac are very small, sub-millimeter, intensely bright or white, hyper-echoic specs which are actually the -- the -- the micro-crystals or these micro-stones that are actually in the bile duct. So... they're -- they're very tiny. They're usually less than a millimeter in size. And because of that, they're actually frequently missed on trans-abdominal ultrasound images. But you could see -- on... -- you could see how, with endoscopic ultrasound, by putting a transducer very close to the gall bladder and scanning the very high frequencies, we have tremendous resolution. And something which is even sub-millimeter in size would be something that we could see quite easily, actually. So what I'm doing now is just trying to get a complete exam of her bile duct, and... and where I am right now is... is up at her -- up at her, what we call, the liver hilum, which is where the bile duct splits or comes together, depending on your -- your perspective. What I -- what I'm seeing right here is... this structure down in here is the bile duct, and -- where the crosshairs are now. And this tissue that's all behind us is the liver. So, basically, what I'm trying to do is get images of the bile duct from all the way up here, where the bile duct is up, and going up into the liver, keeping this... the black structure of the bile duct, again, below me, which I'll keep -- try to keep the crosshairs on it. And as I slowly... as I slowly torque the scope down to the right, we're following that bile duct all the way down until it empties out into the small intestine. So, that -- that sort of assures me that I've gotten a nice, good, thorough examination of the bile duct, all along its length. Stones, of course, can be found anywhere along the bile duct. Usually, they're found in the bottom portion, but you always want to be sure you have a nice thorough exam. And that's what we're getting here, actually: a very nice, thorough exam of her bile duct, all the way from this part, here, where we -- where we're going -- where the bile ducts are actually going up into the liver, and then following them down, as they come down with the portal vein behind it there, coming down through the head of the pancreas, and then exiting out into the common bile duct. So, what -- what I'm seeing so far is that her pancreas appears to be normal; she doesn't have any signs of chronic pancreatitis. There are certainly no masses in her pancreas. Her bile duct is slightly -- slightly enlarged, to eight millimeters, but I don't see any evidence -- any obvious evidence, here -- of stones or sludge within her bile duct.
00:24:38
JOHN BAILLIE MB ChB, FACG, FASGE: Jason, we're going to thank you very much for -- for the tremendous commentary on your endoscopic ultrasound. You make it look very easy; it is a technically complicated procedure, and it's a testament to your training and your skill in this, how easy you make it look. So, given that the patient has a somewhat dilated bile duct, and the suspicion that she had or has, or recently has had, stone disease, it would

seem reasonable to ahead and do the ERCP part of the test. We'll cannulate, as we call it, put a little plastic cannula into the bile duct, inject some contrast, and see what we see. And, as part of that, we may open up the bile duct, and doing what we call a sphincterotomy -- the little muscle that controls the opening of the bile duct is a sphincter, and cutting that's a sphincterotomy. And we'll be getting up with Dr. Evans, my colleague, who does the ERCP part of this test. We have a couple of questions here, Girish, that have come in from our viewers, and maybe I could ask you to address one or more of them.
00:25:44
GIRISH MISHRA, MD, MS: Sure. So, one of the questions that our viewers has asked is how often does ERCP get cancelled after an endoscopic ultrasound. I think that's an excellent question, and one that Wake Forest University Baptist Medical Center and our own group, the Digestive Health Center, and section in gastroenterology, we had specifically asked this question in a research format in -- from a research question. And this was recently presented by one of our fellows, Dr. [indistinct], in Orlando. It won the presidential award of distinction as a poster, asking this question specifically. The other thing, before I answer what the results of that study were, is that at most places, patients have to come back on two separate occasions, two different anesthesia or sedation settings. At our university -- at our medical center, and at Baptist -- we're very fortunate that, with the setup that we have, we can often do both procedures in the same setting, and depending on what the endoscopic ultrasound exam shows, they get -- the patient gets an ERCP or not. The reason we don't go straight off for the ERCP, or straight to that procedure, is, there's a slight increased complication risk of pancreatitis. Now, that's still quite rare in our hands, but anywhere from the range of one to five percent of the time, will the patient suffer pancreatitis -- from pancreatitis -- after the ERCP, and therefore, the need to try to avoid an unnecessary procedure. None of us want to expose our patients to an increased risk of pancreatitis. And so, with that question in mind, we have performed close to 200 procedures where the patients were consented for both procedures. And depending on what the ERCP showed, they went on to an ERCP or not. And in approximately 25 to 30 percent of the time, we cancelled the ERCP, so one could extrapolate and say, in 25 to 28 percent of the time, we potentially avoided a more invasive procedure such as an ERCP, if our patient did not need that -- that test done.
00:28:07
JOHN BAILLIE MB ChB, FACG, FASGE: Well, if we could check in before we go on to the next question, whether they're ready for us in the ERCP room or not? Okay, well they just [indistinct] more time, so we're going to take the second question was, who the candidate [indistinct] for this procedure. I'm going to let Dr. Mishra answer, who's a candidate for the endoscopic ultrasound. With regards to ERCP test, it is more invasive, and so we're very selective in who we do this procedure on. We do it in the people who have obstruction of one or both of the ducts -- the bile duct or the pancreas -- because we can do therapy. And in fact, over 90 percent of our procedures, now, are done for therapeutic indications, which greatly reduces the risk to the people who just need a diagnosis. We use non-invasive or less invasive imaging for that. And now that we have ultrasound, MRI scans, CT scans, and of course, endoscopic ultrasound, we have a lot of information, going in. So, basically, if you have obstruction of your bile ducts, you have obstructive jaundice, if you have pancreatitis, if your pancreas is obstructed, you may be coming to see me or one of my colleagues for ERCP. Dr. Mishra, do you want to tell us who the candidate for endoscopic ultrasound?
00:29:23
GIRISH MISHRA, MD, MS: Sure. Thank you, John. We briefly touched upon this when I asked my colleague Dr. Conway, indications for endoscopic ultrasound. And the majority of cases that we perform here are for determining or evaluating the pancreas or pancreatic biliary disorders. Whether it's a benign condition or a malignant condition, we see a lot of cancers. And originally, endoscopic ultrasound was developed to stage gastrointestinal cancer tumors, such as esophageal cancer and rectal cancer. As you might gather, the

endoscope only allows for an endoscopic view. The beauty of endoscopic ultrasound is that, at the very tip of the endoscope, there's an ultrasound device. Therefore, we can see through the wall of the gastrointestinal tract, approximately five millimet-- five centimeters or so. So from the middle of the chest, to the area where the intestine wraps around the third portion of the duodenum, that's a significant area around the digestive tract that we can not only see within the GI tract, such as the stomach or esophagus, but through there. So things such as a small nodule or bump, we don't know what it is endoscopically. Perhaps this growth is arising from the layers underneath the superficial layer, which we can see with an endoscope. But with an endoscopic ultrasound, we can see all sorts of extra-gastric diseases, such as a growth outside the stomach, or a growth within the lining of the stomach or esophagus or rectum. And certainly, for esophageal cancer, for gastric cancer, for rectal cancers, it is of the utmost importance that one undergo an endoscopic ultrasound, to see how far along that tumor is before they undergo surgery or chemotherapy or radiation. And certainly, for benign conditions such as a stone, we can almost the same accuracy as an MRI scan, or an ERCP, tell whether an individual has a stone. And Dr. Conway nicely demonstrated, in this case, that he didn't see a stone at that time. So hopefully that gives you an idea of the indications for endoscopic ultrasound.
00:31:40
JOHN BAILLIE MB ChB, FACG, FASGE: Okay, a few more questions here. I'm going to let Dr. Evans jump in when he's ready, but I'm going to keep going with the questions. Basically, between the procedures, we have a little downtime... with changing the instruments, sometimes changing the patients' position, but they'll be with us shortly. Another question that came in for us was, you know, what's the success rate for these procedures. Pretty high. As you can imagine, if there are anatomical problems that prevent us getting to the area of interest, just beyond the stomach for ERCP, or the stomach -- any part of the GI tract -- for endoscopic ultrasound. That may make it difficult. And some patients have surgical rearrangements of their gut. For example, if you had surgery 30 years ago for a stomach ulcer, they basically chopped part of the stomach out and re-hooked up your intestine, and we have ways of getting around some of those things. But I would say that the -- the... our inability to do these is down in the one, two, three percent range. One of the things we do a lot at Wake Forest University Baptist Medical Center is take cases from colleagues in the community who've had failures. And some of that is related to equipment; we have state-of-the-art equipment in these specialties. As I like to say to the patients, we've got more toys than the community physicians have. But there's no doubt that experience is also important, and we do a very large volume of these cases, so we may be a little slicker at some of the most difficult cases than our colleagues who are maybe perhaps only doing one or two a month of these in the community.

I'm told that we're ready to go over to the ERCP case, so I'd like to introduce Dr. Jerry Evans, who's assistant professor of medicine. He recently joined us from Duke University. We're delighted to have him. He has the admirable qualification of both training in endoscopic ultrasound that you just saw, and ERCP. So, Dr. Evans, I'm going to give this over to you to tell us what you're doing.
00:33:56
JERRY EVANS MD, MMSc: All right, thanks, John. So, basically, we're doing the exact same thing that Dr. Conway has just done. We're introducing a side-viewing endoscope -- otherwise known as a duodenoscope -- into the stomach, and then we are going to work this down into the small intestine to visualize the papillae. Right there, we're looking at the pylorus which is the exit of the stomach, and we can localize this -- or we need to localize this -- before we get into the small intestines. Pop right through that, and then we do a small little maneuver to try to get our way down into the sweep or the second portion of the duodenum. And --
00:34:28
JOHN BAILLIE MB ChB, FACG, FASGE: What's all that bubbly stuff?

00:34:30
JERRY EVANS MD, MMSc: The bubbly stuff is probably bile, or just stomach secretions. Here we are -- those are just simply stomach secretions. Once you shorten our endoscope, we can visualize the papilla which is the exit of the bile duct, and the pancreatic duct, right here. We can -- then, we will start getting ourself prepared to do our ERCP, and that is... what I like to do first is looking at our fluoroscopy. When -- we'll acquire that, I can get some images of our papilla before we do anything to it, so that we can mark it for future use.
00:35:09
JOHN BAILLIE MB ChB, FACG, FASGE: It looks like this bile duct might actually be talking to you? Is that little opening winking open and shut, or is that my imagination?
00:35:14
JERRY EVANS MD, MMSc: Yeah I think that's it -- no, I think that's it, and that's usually an unfortunate sign because it tells you that it's ready to be cannulated and then... you're so prepared to get in there quite easily and then it shuts its -- shuts its door on you.
00:35:26
JOHN BAILLIE MB ChB, FACG, FASGE: Well, we have a lot of confidence in --
00:35:28
JERRY EVANS MD, MMSc: I know, exactly, and setting up for failure here, rather than success. So, once I get a catheter in place, what we're trying to do now is... I'm showing you the endoscopic view of the papilla. What we're going to do here is flip over our -- our imaging to the fluoroscopic view. But we can't quite get that. Let me try working on getting our fluoro over, so you can see it.
00:35:51
JOHN BAILLIE MB ChB, FACG, FASGE: Maybe I can ask you a question while you're doing that. What's different about this particular instrument that you're using to -- you know, a regular endoscope that you might have like a colonoscopy with?
00:36:01
JERRY EVANS MD, MMSc: Right. So, as I was describing to you earlier, that... the... this is a side view of the duodenoscope, so this instrument is built with all of its visualization mechanics really at a -- kind of at 180 degrees, really, essentially, from the tip. So, our instruments... as it comes out -- as our visualization comes out the sides, we also have an elevator, here, which you kind of see coming out of the three o'clock position of the endoscope. There's a little elevator that I can control from my handle endoscope that allows me to work in a different plane than other instruments. So --
00:36:36
JOHN BAILLIE MB ChB, FACG, FASGE: So you're really looking at -- at the side wall of the intestine --
00:36:40
JERRY EVANS MD, MMSc: Exactly.
00:36:40
JOHN BAILLIE MB ChB, FACG, FASGE: You're looking sideways and you're poking this little cannula out, and you can make it move up and down... have you got a button there, or a wheel or something?
00:36:48
JERRY EVANS MD, MMSc: I do have a -- I have a lever on my endoscope that allows me to move the elevator up and down to control my... my cannula tone. I also have, on this endoscope, wheels that allow me to move in a right and left position, and then I also have a second wheel, which allows me to move back and forward, backing away from the papilla. So, I can achieve pretty much 360 degrees -- or at least -- of my visualization, within these sort of maneuvers of my elevator endoscope and wheels. So straight down that way is the rest of the remaining intestine, so that's pretty much a straight shot. The tip of our endoscope is really at the six o'clock position of our endoscopic visualization. I --

00:37:33
JOHN BAILLIE MB ChB, FACG, FASGE: You look -- you look like you're coming form underneath it. Is that intentional?
00:37:36
JERRY EVANS MD, MMSc: Exactly. It is. So, if you look up on the fluoroscopic view, my dictum, as I teach fellas how to achieve cannulation, is, the three most important things are position, position, position. So, you try to get underneath the papilla; aim up, really, in an 11 o'clock orientation of your papilla. You can see I'm approaching the papilla, here, with my papillatome, to demonstrate where I believe the orifices are. We can usually find the orifice of the common bile duct up here at the 11 o'clock position. Really, I'm covering it with the tip of my papilla -- papillatome right now. I back away from the instrument, again...
00:38:16
JOHN BAILLIE MB ChB, FACG, FASGE: Jerry -- Jerry, we're going to take a -- just a very brief break to answer a couple more questions, here. I think there was something technical he wanted to do in the room, so that will allow excitement to mount, getting ready for your cannulation, here.
00:38:28
JERRY EVANS MD, MMSc: Okay.
00:38:29
JOHN BAILLIE MB ChB, FACG, FASGE: So we'll be back to you in a couple of minutes. I'm going to go over to Dr. Mishra, who's got another hot question on his hands.
00:38:34
GIRISH MISHRA, MD, MS: Sure do. These are hot questions from the audience. One viewer is asking us, what are the risks of endoscopic ultrasound or ERCP. I'll answer the EUS risk first, and then my colleague, Dr. Conway -- sorry, Dr. Baillie here -- will address the ERCP issue. Endoscopic ultrasound, for the most part, poses no additional risk than that of a standard upper endoscopy, and these include infection, bleeding, the risk of sedation or anesthesia risks. Now, any time one takes a scope and inserts it into the body, there's a small risk of a perforation, but that risk is extremely low: less than one in 1,000, one in 2,000. Actually, for an endoscopic ultrasound, that risk is no greater than one in 3,000 cases for a perforation. Now, the pancreatitis risk only occurs if we were to do a fine needle aspiration or a biopsy or a mass, and even then, the risk is less than one percent. And hopefully we'll have some time or opportunity to talk about fine needle operation or biopsy for pancreatic masses and how powerful that is, with endoscopic ultrasound. One of the questions that we asked is what's our success rate. Well, the success rate of actually doing the procedure is nearly 100 percent. The only time that we're unable to be successful in the procedure is if we can't get the scope down to the patient. And that occurs for anatomical reasons. But since the seven or eight years that I've been here, I would say there's no more than seven or eight times, out of thousands of procedures that we've done, that we couldn't get the scope down.
00:40:19
JOHN BAILLIE MB ChB, FACG, FASGE: We're getting the message that can go back live to the case, so we'll keep a couple of these questions for later. Dr. Evans, we're back with you, I think?
00:40:27
JERRY EVANS MD, MMSc: All right, very good. So we've -- I think you can -- can you see our fluoroscopic image, now, John?
00:40:31
JOHN BAILLIE MB ChB, FACG, FASGE: Not quite yet. We're get-- we're -- we've got the room image right now, but.... We have -- we have the fluoro image now.
00:40:39
JERRY EVANS MD, MMSc: You do have it now?

00:40:41
JOHN BAILLIE MB ChB, FACG, FASGE: Now I understand -- I understand that you can rotate that image so it's more up-and-down, is that right? We're using a digital type of imaging, which is very nice. It reduces the amount of radiation to which the patients are exposed. And we can actually control the right-left and up-down. So we can orient this image any way we want, I think, so...
00:41:02
JERRY EVANS MD, MMSc: Okay, so you've got a fluoroscopic image there. John, do you want to demonstrate what we're looking at, as the endoscope versus the -- I see some clips in there, as well, and.... And you can see the tip of my catheter coming out there --
00:41:15
JOHN BAILLIE MB ChB, FACG, FASGE: Certainly, I can describe it, but the -- we're back on to the endoscopic image, here, now, so why don't you just go ahead and get your -- yeah. We're back on the fluoro image. Just let me take one second. The large black snake down there is the endoscope, and you can see just off -- looking like the leaning tower of Pisa -- the axial spine. Sort of halfway up the endoscope, you'll see a kind of white sausage area, there, and that's air that's mainly in the stomach. And just above the -- if you like -- the turn in the endoscope, a number of little black lines that look like staples. Those are actually clips that were placed at the time of the patient's gall bladder surgery. So we would recognize this fluoroscopy as indicating a patient who previously had their gall bladder out. And once Dr. Evans injects some contrast, we will see that flowing north into the bile duct, we hope.
00:42:12
JERRY EVANS MD, MMSc: Yeah, we're just getting our -- our cameras set up, here. You've got fluoroscopy, right, now, John?
00:42:17
JOHN BAILLIE MB ChB, FACG, FASGE: We're back on us, right now. You need a few more moments?
00:42:21
JERRY EVANS MD, MMSc: No, we're ready to go. We just wanted to make sure you guys have the...
00:42:24
JOHN BAILLIE MB ChB, FACG, FASGE: We don't have the fluoroscopy in front of us at the moment, but we'll -- I think it would be easiest that the fluoroscopy comes up for you just do describe it rather than --
00:42:31
JERRY EVANS MD, MMSc: Okay.
00:42:32
JOHN BAILLIE MB ChB, FACG, FASGE: -- rather than us. There's the fluoroscopy back.
00:42:34
JERRY EVANS MD, MMSc: Okay. So, if you're watching then endoscopic view, then you can see the tip of my papilla-- I mean my cannulatome, right there, again, at the two o'clock, about three o'clock, position. I'm looking at it fluoroscopically to make sure that I'm kind of in an upward position. I really want to start cannulating up towards -- not really towards the clips, but in that general direction, rather than at a...
00:42:59
JOHN BAILLIE MB ChB, FACG, FASGE: Can we flip back on to the endoscopic view, because we're only getting one at a time here, so, it would probably be more interesting -- here we go, we're looking at what you're doing now. So you're aiming for a very small target.
00:43:08
JERRY EVANS MD, MMSc: I'm aiming at a very small target up there at the tip, so... I'm now going to see what I can do about getting up there, so...
00:43:14

JOHN BAILLIE MB ChB, FACG, FASGE: Is that little guide wire poking out, there, too?
00:43:15
JERRY EVANS MD, MMSc: It is. Yeah....
00:43:23
JOHN BAILLIE MB ChB, FACG, FASGE: So this looks like the space shuttle docking, and it looks like the docking may have been successful. We're going to go back to fluoro and -- you've got a guide wire, are you going to push that in to see where it goes?
00:43:32
JERRY EVANS MD, MMSc: We have a wire up there, looks like it's actually going into the pancreatic duct.
00:43:36
JOHN BAILLIE MB ChB, FACG, FASGE: Okay.
00:43:37
JERRY EVANS MD, MMSc: So, we're going to pull our wire out. I think that winking at us was probably, actually, the pancreatic duct. So I'm going to try to work a little bit closer here, get up on top of it...
00:43:49
JOHN BAILLIE MB ChB, FACG, FASGE: While you're doing that, Jerry, I might just address, very briefly, the issue about risks of this ERCP test. This test has been around since the 1970s, and it's been recognized from very early on that the pancreas, in particular, can take offense to being instrumented, even if you're not actually in the pancreatic tube or duct, just being around it can irritate it. So, the main risk of ERCP, historically, has been pancreatitis. Because we now avoid using it for anything, really, except therapy, by using other imaging modalities, we've greatly reduced the number of patients who get pancreatitis. And we also, if we keep going into the pancreatic duct, we can place a little stent in there, which is a little plastic wick to ensure the drainage is preserved. So, Dr. Evans is doing exactly the right thing which is being very slow and methodical and careful, to try and find the right direction of access to get into this patient's bile duct.
00:44:56
JERRY EVANS MD, MMSc: What I'm going to end up doing, I think -- it looks like, the way she's oriented is... the way she's oriented, it appears the pancreatic duct is the predominant duct to be entered into. So what I may end up doing is trying a small little trick to allow myself to get access to the preferred duct. And that is, if I can get deep access to this -- this wire -- I may switch to a different wire, leave that one in place, switch to a different wire and then try to cannulate over that wire. I can see why he had a lot of trouble -- this patient had some trouble in previous ERCP attempts. He certainly does look to be in a very favorable bile duct cannulation position, however, it's just -- does not appear to want to go into the proper duct.
00:45:37
JOHN BAILLIE MB ChB, FACG, FASGE: I would say for the audience, particularly those who've never seen this before, it looks like there's a lot of bleeding there, but this is grossly magnified. This is a very tiny little nipple in the wall of the bowel, and so, what looks like a lot of blood there is actually just a very small ooze. Because his tissue is tender and what we call friable, and... just touching it with anything will make it do that. This will not cause the patient any problem. This is not blood loss that's of any significance. So while you're doing that, we're going to take a question or two. The question I have here -- and maybe, Girish, you can answer this -- what's the average EUS procedure time, as part of the combined approach, so what percentage or what time would we devote to that.
00:46:27
GIRISH MISHRA, MD, MS: Well, thanks again. It's almost as if someone has prompted our audience, because again, this question was addressed and answered in our study which hopefully will get published sometime soon. On average, the EUS portion added 17 minutes to the entire combined procedure. So, not a whole lot, but certainly, some additional time

was needed when we combined these proce-- the two procedures. But certainly, 17 minutes is so -- such -- less time compared to if the patient had to go home, come back, get a driver, get sedated again, and for another procedure. So we feel that the 17 minutes are worth the investment, really, for the patient to have this done in a combined format.
00:47:18
JERRY EVANS MD, MMSc: John, I don't know if you can hear me now, but to interject, we have gotten ourselves into the bile duct.
00:47:24
JOHN BAILLIE MB ChB, FACG, FASGE: Dr. -- Dr. Evans is back on and he's indicated that... it's a bit like those cooking shows where, you know, they prepared it before the show and now the cookies are ready. He -- a miracle occurred while we weren't watching and he got into the duct, but...
00:47:38
JERRY EVANS MD, MMSc: Thanks for those kind words.
00:47:39
JOHN BAILLIE MB ChB, FACG, FASGE: [laughs] Can you tell us how you did that?
00:47:41
JERRY EVANS MD, MMSc: Well, I think it's just a matter of getting in a better position. I was able to put a little bit more angle on the wire, and it was just really a matter of finding the right entry point on the papilla, making sure I was above a small fimbria.
00:47:54
JOHN BAILLIE MB ChB, FACG, FASGE: I might make a brief editorial comment that sometimes when we have failed cases that come here, this papilla looks like a boxer's ear after 15 rounds and that's because people get a little rough and they get frustrated. So, what Dr. Evans has done is exactly the approach, which is to be very slow, methodical, careful... try different techniques. And really, you can see, he hasn't traumatized this opening. So, that's a great help for the patient because that greatly reduces the likelihood that she will suffer pancreatitis as a result. Do you have fluoro image to show us?
00:48:30
JERRY EVANS MD, MMSc: Yeah, well we're about to inject for you. We're going to do this real time. So, we've gotten ourselves into the bile duct; I'm quite certain of that because we have the wire deep into her... into her intrahepatic ducts. And so I've asked Michelle, here, to go ahead and inject, and as we can see, we're filling the bile duct with this dark contrast medium. And we're looking for any sort of stones or strictures or anything that might be in there that's causing her discomfort. And you can see from the cholangiograms, that actually looks very good. The -- can tell where I have my cannula, my papillatome, I'm traversing up into the ducts in the area of their cystic duct. Right there, where you see the tip of the cannula, the very small, dark thing sitting right on top of the endoscope, I put that right next to the cystic duct to just highlight the cystic duct, which is the duct that has been cut and separated as the gall bladder was removed.
00:49:25
JOHN BAILLIE MB ChB, FACG, FASGE: Well let me just ask you to share your thought process, in real time, here. Here's a lady who had transient abnormalities of her liver tests; was reported to have a dilated bile duct at that time. They normalized... she previously had a cholecystectomy. It kind of sounds to me like she had a stone that she passed, and... your nice demonstration, here, convinces me there's not a stone. So, is there any indication, in your mind, for opening up this duct and going trawling in it, or are you done?
00:49:58
JERRY EVANS MD, MMSc: Well, so, yeah, I'm kind of thinking about that as you're talking. The presence -- so, our ultrasound told us she had a slightly dilated common bile duct, and in that -- in the setting of a dilated common bile duct with abnormalities of liver function tests, that takes us to an entity of sphincter oddi dysfunction. The sphincter, I think, has maybe been previously described as the type of muscle that sits there at the exit of the bile

duct, and really guards entrance of intestinal fluid, and prevents it from going up into the bile duct, keeping it somewhat sterile area. With the presence of sphincter oddi dysfunction, specifically type one, we know that an [indistinct] sphincterotomy will improve the presence -- will improve their abdominal pain to a very good degree with some long-term success. So, I believe I will make a small -- an incision here, and likely we'll look for any stones with a sweep of a bile -- of a biliary gland. We should be able to achieve this in the next couple of minutes. I'm not going to do a very large sphincterotomy, but I think it's going to be one enough so that we will be able to open up her duct and relieve her from any symptoms.
00:51:05
JOHN BAILLIE MB ChB, FACG, FASGE: Can you tell us just in simple terms how you're going to do this cut?
00:51:09
JERRY EVANS MD, MMSc: Absolutely. So, you see the papillatome has a small wire, there, that's traversing from the blue area on the endoscope down onto the black little band on the endoscope. And that is going to be our cutting wire. We're going to use that and electrify that using electrocautery. We're going to heat that up to... I don't exactly know what temperature, but good enough that we're going to make an incision that's going to go up the length of this -- of that wire. And I'm going to aim in a certain direction that's going to be in the bulge of that area that is kind of lying over the wire. I do that because I know that is going to be the intraduodenal segment of the common bile duct, and I can cut up that area, oh, maybe about a centimeter or so, maybe not that much, maybe a half a centimeter, without causing any serious complications including bleeding or perforation.
00:51:56
JOHN BAILLIE MB ChB, FACG, FASGE: So are we going to see, like, an explosion, here, or flashes of lights, or is it going to be noisy or...?
00:52:00
JERRY EVANS MD, MMSc: No, it's going to be nice and -- you'll see maybe a little bit of heat, little bit of smoke, maybe a touch of blood, but it should be not too problematic. What I'm going to do is --
00:52:09
JOHN BAILLIE MB ChB, FACG, FASGE: Is the patient going to be aware of this?
00:52:11
JERRY EVANS MD, MMSc: The patient will feel nothing of this. They'll have no idea this is going on. I'm going to make a small little cut here using just pure coagular-- pure electrocautery, and that's just to allow this area to open up a little bit. And you see a little bit of smoke. And now I'm going to change the settings on my -- my electrocautery, pull into the duct a little bit, express the extra portion -- extraduodenal portion of the ampulla, and I'm going to continue cutting in an upward fashion. Tighten. So probably one...
00:52:51
JOHN BAILLIE MB ChB, FACG, FASGE: So but, the -- you're using a kind of current that, that will -- that actually seals the blood vessels so they won't bleed, is that correct?
00:52:57
JERRY EVANS MD, MMSc: That's exactly right. And you can see, we've made an incision here and there's no bleeding. Tighten up a little bit.
00:53:03
JOHN BAILLIE MB ChB, FACG, FASGE: That knife, you do this... Dr. Evans, it doesn't mean that your lunch can go up your bile duct?
00:53:09
JERRY EVANS MD, MMSc: It does not. Now, there are -- it really does not. There are some issues, maybe, with relay-- creating very large sphincterotomies and long-term -- relax, let's go ahead and...
00:53:22
JOHN BAILLIE MB ChB, FACG, FASGE: So most patients don't know that they've had a

sphincterotomy, they don't get problems from making a hole like this?
00:53:27
JERRY EVANS MD, MMSc: They have no problems.
00:53:28
JOHN BAILLIE MB ChB, FACG, FASGE: Now that's interesting, it looks like there's some -- some little particulate things coming out.
00:53:32
JERRY EVANS MD, MMSc: It sure does. So --
00:53:33
JOHN BAILLIE MB ChB, FACG, FASGE: Stone debris?
00:53:34
JERRY EVANS MD, MMSc: Yeah, it does look like it's a little stone debris. See if we can... close in on that a little bit, but...
00:53:39
JOHN BAILLIE MB ChB, FACG, FASGE: Yeah, we get quite a good view of -- are you going to trawl this stuff --
00:53:42
JERRY EVANS MD, MMSc: I am.
00:53:43
JOHN BAILLIE MB ChB, FACG, FASGE: -- to a basket or a balloon, or...?
00:53:44
JERRY EVANS MD, MMSc: We are going to now exchange our instruments, and we're going to put -- well, we went ahead and came out. But... we're going to put our wire back up in place to make sure -- go ahead in on the wire... all right, good. Now we're --
00:53:54
JOHN BAILLIE MB ChB, FACG, FASGE: So just -- just to explain, Jerry, or maybe you'd like to explain, what is that debris? Is that actually a stone, or is it sludge, or...?
00:54:01
JERRY EVANS MD, MMSc: I think it was -- I think it was a small stone, John, to be quite -- to be quite honest with you. I didn't... you can see large stones on the cholangiogram; sometimes you cannot see smaller stones. There's been a recent editorial in one of our leading journals, *Gastrointestinal Endoscopy*, from a gentleman named Pat Pfau who's up in Wisconsin who's debating the ideas of [indistict] sphincterotomies and sweeping in patients who have [indistinct] as our patient here. And the jury's really out. I mean people sometimes feel like if they do not see stones on a cholangiogram, they still feel that, with the indication being as high as... within the patient, being certainly high, that it's worthwhile. And certainly in my experience... my clinical acumen tells me that there is a stone in the bile duct, I will go ahead and do a cut and do a sweep of the bile duct, and I have gotten out stones where my cholangiogram did not really demonstrate those stones.
00:54:55
JOHN BAILLIE MB ChB, FACG, FASGE: We have an image on the PowerPoint of what an industrial-strength stone would look like --
00:55:00
JERRY EVANS MD, MMSc: Mm hm.
00:55:01
JOHN BAILLIE MB ChB, FACG, FASGE: -- so this -- if we can go over to that, just for therapy's sake, and while you're getting prepared. This image here, on the PowerPoint presentation, this is... I'm -- with the arrow, I'm showing the scope. It's the other way around to where you were seeing it on our fluoro, but this big structure here, with some white in it, and a little air in, is a bile duct. And here is a faceted stone that has been grass with what we call a basket, and he has a bunch of wires forming a little basket, and we're pulling the stones out. So sometimes these are -- are very large stones, and the larger stones we actually have to crush with a special mechanical device before we even pull the

stones out. So, on a scale of one to ten of stones, what you took out would be small, but they can still cause plenty of symptoms. Dr. Mishra, any comments?
00:55:53
GIRISH MISHRA, MD, MS: No, I think that that's a beautiful demonstration, Jerry, of how you make that incision, and I do feel that -- you know -- that the endoscopic ultrasound showed that the duct was about eight millimeters, which is a little bit greater in size than one would expect. And perhaps these small, tiny fragments is what was causing chronic dilation. And fortunately for our patient, there is no suggestion at all of any malignancy, and if we have some time I would like to share how endoscopic ultrasound is very powerful in -- in determining what we can answer for a suspected mass in the pancreas.
00:56:35
JERRY EVANS MD, MMSc: Well Girish, let me tell you -- real quick, let me just complete this exam, because we're about done. Why don't you just look up on the endoscopic view real quick and we will blow up the balloon and show you what we're using here to sweep her duct.
00:56:46
JOHN BAILLIE MB ChB, FACG, FASGE: So that -- that's a balloon catheter that you're inflating now, and so that will be inflated inside the duct, is that correct? and then --
00:56:52
JERRY EVANS MD, MMSc: That's right.
00:56:53
JOHN BAILLIE MB ChB, FACG, FASGE: And you will pull back, and that will help trawl any junk that's out there.
00:56:57
JERRY EVANS MD, MMSc: Correct. Yeah, we're going to watch on the endoscop-- the photoscopic view, now. We're running our catheter up to where her [indistinct] ducts take off. Go ahead and ask Michelle to expand the balloon.... She's going to expand the balloon to the size of the ducts, and as we...
00:57:14
JOHN BAILLIE MB ChB, FACG, FASGE: Can we watch this on the fluoro? Can we switch over to that? So, that little... light area up near the clips is the balloon...
00:57:23
JERRY EVANS MD, MMSc: Yeah.
00:57:24
JOHN BAILLIE MB ChB, FACG, FASGE: And Michelle, our head nurse in the ERCP room, is locking that so it stays inflated, and you're going to pull it?
00:57:31
JERRY EVANS MD, MMSc: I'm going to -- yeah, I'm going to pull it slowly through the bile duct, and Michelle is going to inject contrast on the... on the opposite wall of that balloon. So we're going to do what we call an occlusion cholangiogram to make sure we didn't miss any stones, and... if we pull this basket out or this balloon out, we have no stones as we pull it out, we're going to be done with our exam.
00:57:48
JOHN BAILLIE MB ChB, FACG, FASGE: I -- just as you're getting ready to do that, we're almost out of time here, and I would be remiss if I didn't thank everybody who've been involved in putting this together. As you can imagine this is a... a very labor-intensive procedure. Here we come with the balloon, now. Can we get the endoscopic view as you come out of the bottom here? Here we comes. Here comes the balloon... and do we see anything out there? Not really. Normally we do this for a couple of times just to make sure we didn't miss anything. To finish my thanks, there's a whole anesthetic team keeping this patient asleep. We have our excellent endoscopy nursing assistant team. We have all of our colleagues from -- who are doing the audiovisual work today. And obviously our colleagues who've been involved in the presentation. So we'd like to thank them all. I'm sorry we

haven't been able to get to all of the questions. If you have additional questions or would like information about either a self-referral or a physician referral, please use the buttons in front of you on the webcast, and we will get back to you.
00:58:53
GIRISH MISHRA, MD, MS; It's -- John, I think, excellent demonstration, and we really are very fortunate, at our institution -- at Wake Forest University Baptist Medical Center -- to have physicians who have expertise, such as yourself, Dr. Conway, Dr. Evans, and myself. As -- like anything that is worthwhile and is done right and well, it's a team approach, and having the physicians who take the time to devote extra training, and do a high volume, that helps. But we could not do this without the special training of our nurses who do this on a daily basis. So it's -- that, and pathology, and our equipment that's available to us, that allows us to perform these very complex procedures on a routine, daily basis. And we're fortunate for that. I don't know if we have some time just to… do we have any time to address another scenario in terms of malignancies of the pancreas? So, we -- today we demonstrated a benign condition such as stones, and that is what I, as a physician, hope to find every time, but unfortunately, doing endoscopic ultrasound and ERCP, often we're faced with malignancies. And what's powerful about these two techniques and technologies is, the patient comes to us suspecting that they have a malignancy, and we're able to answer that question, know what the cell type is, and often, suggest how far along this tumor is. And I'm talking about endoscopic ultrasound. So if we can switch to the PowerPoint, there are very salient questions that we ask, that -- is this a mass? What is the mass? Is it benign or malignant? Does it need to be resected, and is it resectable? And often we're able to answer all of these questions with endoscopic ultrasound. And our EUS col-- sorry, our ERCP colleagues can help us for palliation purposes. This is a -- a case that was presented to us not too long ago: a young woman -- a middle-aged woman -- with dilated ducts, weight loss, a stricture on ERCP, but a CAT scan, did not show a mass. And, very similar to what Dr. Conway showed today, you can see that, by endoscopic ultrasound, we did see a mass right here. Again, the CAT scan did not show a mass. So then we performed a needle biopsy. We were unable to show you that today, but we can do all this via endoscopic ultrasound, and the plastic tube and stent that this patient had is right there. So, within minutes of this individual who we suspected had a mass, although the CAT scan did not show a mass, we did a needle biopsy, and we also showed that the patient had some dilated ducts. And on-site, I think you saw this on the promo for our procedure that was shown earlier on the webcast, this is a cytology that we put the tissue that we get from the procedure right on the slide, and outside of our room, our pathologists and cytopathologists can come in and these are malignant cells. Again, our individual today -- thankfully; fortunately -- did not have cancer, but we are often faced with patients that present as such.
01:02:15
JOHN BAILLIE MB ChB, FACG, FASGE: Just before we wrap this up and really are done now, one last question that was a very good question is how long does it take to recover from these procedures. And the answer is pretty quick. Particularly with anesthesia, it wears off quickly; we have to keep the patients about half an hour, legally and medically, to make sure they're awake. But almost all of our patients who are outpatients go home the same day. They can't drive the same day, but they can do their other activities, and people are pretty satisfied with this kind of sedation. So I'm going to thank my colleague, Girish Mishra. Again, thanks to the whole team, and a special thanks to you for -- for watching.
01:02:53
GIRISH MISHRA, MD, MS: Thank you again.
01:02:58
ANNOUNCER: Thank you for watching this presentation of a live endoscopic ultrasonography, and endoscopic retrograde cholangiopancreatography, from Wake Forest University Baptist Medical Center, in Winston-Salem, North Carolina. ORLive makes it easy

for you to learn more. Just click on the 'Request Information' button on your webcast screen, and open the door to informed medical care. ORLive: the vision of improving health.
01:03:30
[end of webcast]