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Permanent Contraception: Utilizing Transvaginal Ultrasonography to Confirm Appropriate Insert Placement

Dr. Hector Chapa:

I want to welcome everybody to this presentation, this program, which is vital as we move forward in the area of female sterilization. This program will cover permanent contraception, but specifically utilizing transvaginal ultrasound as a confirmation test as an alternative, as a complement, or as a second version of the old standard, which is a modified HSG. So again, as part of the introduction, my name is Hector Chappa, I'm part of the clinical faculty at Texas A&M College of Medicine for the department of OB/GYN.

Well, as we move on, let's move on to the second slide and review the purpose of our meeting. What are the objectives? Well, of course, the main objective is to review how to do this. This is to review the protocol or the employment of transvaginal ultrasound in order to allow a patient to rely on the microinserts placed by the physician. We have to understand the benefits and the disadvantages of TVU in the confirmation process of these microinserts, and where does this whole algorithm fit in, and did modified HSG go away? How does this algorithm, this new flow, look like? We'll cover that. And then, the third is to bring some awareness, to bring some resources, to anybody who's doing transvaginal ultrasound for this purpose. In other words, to bring awareness to resources that can help physicians, sonotechnicians, or any provider who is going to be doing this procedure to allow reliance for a patient, and that will happen at the end of this presentation with a couple of references that I think will be helpful.

All right. Well, let's get into the basics here. On slide 3, we have the real crux of the problem here, and that's that women remain at risk for unintended pregnancy. So, in the U.S. 43 million women who are of child-bearing age are at risk of unintended pregnancy. That's a lot of women. Now, of women who currently use contraception, more than half about 67%, use some method of nonpermanent methods; that includes birth control pills, the vaginal ring, or injectables, but 25% of women relied of female sterilization. Now, the oral contraceptive pill and female sterilization have been the two most commonly used methods since 1982. So, that's why we have to do better.

Well, how does this permanent contraception arena or theater look like? Well, historically, of course, that was all done by laparoscopy. Laparoscopy entailed the patient going to day surgery or an outpatient surgical center and getting placed under general anesthesia and entering the abdomen to occlude the fallopian tubes. But, more recently, as of 2002, the hysteroscopic method came to be. So, the hysteroscopic approach is a non-incision method of going through the natural orifice of the cervix, of the uterine opening, to occlude the tube from the uterine cavity out towards the tubal lumen. Well, this happened, as we just mentioned, with FDA approval in 2002.

Now currently, there is only one FDA-approved medical device for hysteroscopic sterilization. This device uses a combination of nitinol and fibers called polyethylene terephthalate. Because that's too big, everybody always calls it PET fibers, and that's fine. This nitinol-PET fiber combination will make up the microinserts which are placed hysteroscopically, bilaterally into the tubal lumen, and after a slow, natural process of about 12 weeks, there is tissue ingrowth through those microinserts, which results in tubal lumen occlusion. Now, here's the catch, though. Because this is done hysteroscopically, and unlike the laparoscopic approach that's done and patients are told to rely, this is the only method that has a confirmation test. So, that can be attractive to some patients; rather than just taking our word for it, there is a confirmation test that is done at 12 weeks to not only assure the physician that it's occluded, but more importantly, to give the patient the peace of mind that she can rely.

Well, that brings us to our next slide, which is slide 6. So, let's talk about this confirmation of placement. Because historically, there was a modified x-ray, modified for a thoroscopic exam, called a modified HSG. Now, traditionally, an HSG was an infertility test, looking for tubal occlusion, but using a variant of that with lower volume and lower pressure, this instilled a little bit of contrast into the uterus to see if there was any spillage through the tubes. Now, in July of 2015, this transvaginal ultrasound approach was approved by the FDA as an alternative confirmation test for hysteroscopic sterilization. What does that mean? It means patients now, if they qualify, and if they want it, now have the choice, rather than just having to be mandated to go to the modified HSG, they have a choice to choose that or an office ultrasound for confirmation. Now, physicians have to advise the patient about the type of confirmation test that is required; we can't force one toward the other. They have to be given the options. Now, they can have the modified HSG or the TVU, but they have to pick one of those two, because without the confirmation test, the patient cannot have reliance and must use an alternative method of birth control.

Well, let's jump into this, because this is really what we're here for, this confirmation test, and the next slide kind of breaks this down a little bit further. In the past, before July of 2015, the traditional method used a modified HSG, or hysterosalpingograph, which put the patient under fluoroscopy. Now, the benefit of that is that that was considered the gold standard, that was the definitive. In other words, if the HSG said you can't rely, the game was over. There was no second opinion to the HSG. However, the con, the disadvantage, is that it does expose patients to radiation, and it uses an outside facility, not one that's familiar to the patients like the physician's own office. And, here's the catch though, just because you don't see dye leakage, doesn't mean the tube is occluded. How is that possible? Well, we know from published studies that HSGs can be falsely positive for occlusion because sometimes tubal spasm can occur, and it looks like it's occluded, and it's not. So, there's issues with the HSG.

Now, bring us to 2015 and forward. The transvaginal ultrasound provides this present alternative. What's the pro here, what's the advantage? Well, the advantage is it's less invasive, there is no radiation, it's just an ultrasound, and it can be performed in an area that's familiar to the patient, like the physician's own office. Now, here's the biggest advantage; so, remember, the modified HSG is a photo negative, it's an x-ray. So, you really don't see the uterus, you're looking at the uterine cavity filled with dye and the microinserts. But only TVU provides the relationship between those microinserts and the soft tissue surrounding it, to get you a better idea of where they lie. But what's the con? Well, the con, of course, is that we're looking for a location, which is okay, but it doesn't tell us anything about occlusion, because the assumption is if they're placed right, we know from the data it should work right. However, about 15-20% of patients, based on the data, can get an inconclusive ultrasound report. Why? Well, uterine lie, uterine position, equine; there's several reasons that every sonographer knows sometimes give you an inconclusive picture, and these patients need to continue down the path to the modified HSG. So, unlike the HSG that was the end-all-be-all referee, the TVU is not the end-all, end say in this reliance algorithm. If a patient cannot get a definitive allowance, based on TVU, it's not over for her, but she needs to continue on in the diagnostic path and proceed with the HSG.

So, let's talk about this a little bit more, because I'm kind of a visual person. And so, slide 8 really breaks it down a little bit better. Here's how it looks. First of all, there is bilateral placement of the microinsert. Remember, if she has two tubes, which she needs for this procedure to occur, she has to have two inserts placed. Then, the option can be given to patients who meet the procedure criteria—in other words, just because she has the microinserts placed doesn't mean she goes right to TVU as an option. She has to qualify, based on procedure characteristics. What are those? Well, the physician is charged with knowing those qualifications, those indications, and so that's on his or her part. Once the patient qualifies, then she can be offered either the TVU at 3 months or the modified HSG, both, again, at 3 months. So, they shouldn't pick one because they think one's faster; they're both done at 12 weeks post-procedure.

Now, let's take a look at this a little bit further. In slide 9, we kind of said this already, but it's nice to break this up because you can't mention this enough. If the patient meets the procedure requirement at placement, and she wants the TVU, then offer it. And remember that this is TVU, transvaginal ultrasound, not TAU, not transabdominal ultrasound. So, make sure you have the right transducer, which is anywhere from a 5.8 to about a 6.5, based on the study, but of course we know that those vary. If the T results, or the TVU results, allow reliance, she is fine. But if the TVU results are not appropriate for reliance, she must continue down that path, that's the side box, to continue on to the modified HSG for a final determination. Okay.

Well, let's keep going here. On slide 10, we have some information about confirmation test training, because there is nothing worse than doing a great placement, but the whole thing falls apart because we have inadequate training, and it's not fair to allow a patient to rely, when it wasn't done correctly. So, the confirmation test, by either TVU or the modified HSG, should be performed only by those who have the experience and the training; that's a gynecologist, an ultrasonographer, a radiologist, whoever's trained to do this. So, make sure that we don't just give this to anybody, they've got to know what they're doing. Basic TVU skills are required and, of course, AIUM online has those guidelines, and that's, of course, the American Institute of Ultrasound in Medicine.

All right, having covered the basics of training and why that's important, let's now get into the specifics and some of the anatomy review. Now, just bear with me, I know that you know this already, but we have to do this for quality measures. So, let's take a look at some of

the basic anatomy and terminology that will apply for this TVU confirmation. Now, what we all know, one of the big advantages that we already stated is that the microinsert has spatial relationship to the soft tissue surrounding it. So, let's take a look at that soft tissue that's around the insert. Number 1, we have to orient ourselves, and we'll get into that step in a minute, of the uterus in sagittal view and, of course, where the fundus is. Now, this microinsert crosses the interstitial portion coming from the tubal ostia at the internal structure of the cavity, through the muscular area, through the SUTJ, of course that's the serosal uterotubal junction. This is visible only on TVU and not on x-ray.

Our next slide kind of reviews the same thing. We have to remember what we're talking about here, the cornua, or the cornu, is where these microinserts should be placed. Once we talk about the protocol itself, any variance in symmetry, if they're not symmetrical, that patient may have an indication to go for confirmatory tests with HSG, the modified HSG. This is what we're talking about here. These microinserts have to span that interstitial zone from the endometrial cavity, optimally it touches it, and we'll talk about that in a minute, through the muscular area without kink or coil, and then through the SUTJ. And again, that's only visible on ultrasound. Taking what's discussed here, we just mentioned the ostium or the tubal opening that's visible hysteroscopically, not on ultrasound, but what you can see on ultrasound is the uterotubal junction where that insert leaves the serosa as a contour of the uterine structure, the external uterine serosa is seen, is vital to determining the location of this insert for reliance. And those are images, it's better to kind of talk about it with an image itself. And so, let's take a look at that on slide 14.

So, here's what we're talking about. Taking those schematics and putting it in real-life practice, of course what we see off to the left-hand side is the globe structure of the uterus. The echogenic line, of course, is the microinsert. Now, on the left, there is a small echogenic dot, or speck; that is the proximal band, the platinum band, but that's not necessary for confirmation. What we see here is that the proximal end of the insert abuts the endometrium. We see the linear axis of the insert come out and through, or past, rather, the serosal edge and cross the SUTJ, the serosal uterotubal junction. Now, if you can see distal, you see that other little echogenic dot. That's the distal ball tip of the microinsert itself. That may or may not be visible, this is just seen on this image. What is vital, though, is the location of that linear axis, which must be without bend or kink, and must be through the SUTJ.

All right, now, on our next slide, please bear with me, because we know that you understand planes of view, but they're vital to understand this TVU. Now, I know you all know this and you're keenly aware of it, but the phases or the planes that are vital to this test really are three. The TVU confirmation test will use a sagittal uterine plane, and transverse and an oblique view for each insert, all right? So, three planes, that's all we need; sagittal, transverse through the fundus, and oblique view of each cornu for each insert.

The sagittal view is separating the uterus into right and left planes. Now, the sagittal view must be done in the midline of the uterus. We'll show you that in a minute. The transverse view separates the top half from the bottom half of an image, and that transverse view is going to be vital to make sure that there's two inserts to begin with, and that's called identification, and we'll talk about that in a minute. Now, the oblique view of each cornu is where it's at, because the oblique view is necessary to find the location of the insert that will give the patient reliance. Now remember, if one is good but the other location on the other side isn't, it's all over. It's not about one being good enough, both have to be good enough to allow reliance. So, sagittal, transverse, and oblique, with oblique providing reliance with the location of the insert.

All right, well let's take a look at this in a real image. What we see here, of course, is our sagittal uterine view. I want to stop here for a minute because I want to introduce a concept that is vital, the concept of OIL, that's O-I-L, OIL. OIL stands for the acronym that we can't forget for this TVU. O is for orientation of the uterus, not orientation of the inserts, but orientation of the uterus, and that's first. Why? Because we have to know if the uterus is anti, retro, or mid to prevent us going any further and giving a wrong diagnosis. So, let's start with O, and this is this image here. The orientation of the uterus, as you all know, is done by a sagittal uterine view. So, the probe is placed into the vagina in a sagittal view, and the entire body and cervix of the uterus should be visible in one plane.

Now, the endocervical canal and the endometrial stripe should be continuous as one line. When we have that in one view, that's our sagittal view, and the orientation, the O of OIL of the uterus, is done. Is it anti, retro or midline? Now, why is this important? Well, you've got to remember that these inserts are in the cornu, they're on either side of the midline. So, if we ever see a microinsert echo, if we ever see a microinsert shadow in the midline sagittal view, that microinsert is probably in the fundus, and we need to send that patient for a definitive modified HSG for confirmation, okay? So, the sagittal midline view is not just for orientation, it's to make sure that there's no microinserts in that midline view, which would be concerning for an abnormality. Now, if you pan the probe to the right and to the left, you can see each microinsert as you move the beam towards the right and left cornu. But in the midline sagittal plane, no microinserts should be seen.

All right, now let's go from sagittal to transverse. By rotating the sagittal transducer 90 degrees, of course, you get a transverse view of the fundus. Now, we're going from O of orientation, in OIL, to I, which is identification of the inserts, okay? OIL, O-I-L, now we're on the I, so we're moving on. For identification, we have to see two inserts. Why? Well, because in order for her to qualify for this, she needs two

inserts placed, and if one is only found, one is missing and expulsions have occurred; we stop right there. That's an indication to send the patient to modified HSG, because an abnormality has been found on TVU. In the transverse view, we should see two microinserts, but not only the number, we should also look for their symmetry. In other words, they should be symmetrical, they should be mirror images, and this should be contiguous without any break in either shadow. For example, on the right-hand image, we see the transverse spoke of the view of one cornu, where we see the microinsert leave the endometrial cavity, transversing through the myometrium and out through the SUTJ.

Now, we're going to pause here for a minute, because sometimes we're looking at these images and then realize that if you are a sonographer or a technician or radiologist, you may never have seen this insert, so you're saying, "What is that white line?" Well, here's what we're talking about. Slide 18 is the anatomy, so to speak, of the microinserts. Now, of course, this is not to scale, but the microinsert itself, wound down to 0.8 mm, completely expanded within the tube at about 2 mm, 2 mm, and the entire length of the device is 4 cm long. It is an inner stainless steel rod, surrounded by an outer nitinol coil, which provides stability.

So, let's understand the specifics in the next slide. How do we perform the confirmation test? We know the basics, we've talked about sagittal, transverse, and oblique, but what does this mean? What do we do when we get some images? How do we interpret these results? Well, let's jump right into that, because we're short on time. Okay, so let's get into the FDA requirements of how to do this right. The TVU confirmation test, just like the modified HSG, has to occur at 12 weeks, that's 3 months, post-placement. This is not a 6-week or 8-week; they are both at the exact same time. Now, by requirement, by the FDA, there are three required images; that's our first kind of clue here. The whole topic here, the whole theme of this 30-minute presentation or so, is the number three. There's three images, there's going to be three planes of view -- sagittal, transverse, and oblique -- and then three possible outcomes. Remember, three.

Well, what are those three images captured? Well, the first is the scout image. That scout image is looking for, or scouting for, those microinserts. So, we've already covered that. That's done in the transverse view for the identification of them. And then, the other two images are the oblique views of each insert, one for the right and one for the left. Again, three views, three pictures, three possible outcomes.

The next slide goes over what we've already introduced. Here are our three components for TVU. We need to know the uterine orientation, determined in sagittal view. We need to scout out these inserts. We need to identify them in transverse view. And then, the L in OIL is we need to see their location. And remember, both of them have to be correct, either optimal or satisfactory, to allow reliance. We'll show you what that means in a minute. But, their location is based on a cornual oblique view, which is between sagittal and transverse, to find that linear axis of each insert in relation to each specific cornu. Location is how we determine reliance. Location is how we determine reliance.

Okay, so let's get into orientation first, not location, but orientation. Remember that orientation, or the O in OIL, is the first step in this algorithm. Placing the endovaginal probe in a sagittal view, we see the sagittal plane of the uterus from cervix to fundus, all in one image. The endocervical canal must be continuous with the endometrial stripe for this view. If you pan from right to left, each insert can be visible. However, in the midline, sagittal view, which is required for orientation of the uterus, no microinserts should be seen. Visualization of the proximal end of one or both inserts in cross sections may indicate trailing coils in the uterine cavity when you look to the right or left. I can't stress that enough, that the linear axis of either insert should not be visualized in the midline sagittal view. So, the whole point here is that orientation is only to know which way the uterus is headed. Is it mid, anti, or retro, so we get our correct labelling in the next step.

Next is identification, or the I in OIL, which is our scout image, going from the sagittal view, rotating the transducer 90 degrees will give us our transverse fundal view. The goal is to visualize a portion of each insert simultaneously within the cornu. What does that mean? It means one picture, transverse view, two insert shadows. Both have to be seen for this step to work. Slight probe rotation and adjustment can be required to get this right image, or gentle endovaginal probe pressure can be applied to improve the tissue contraction and the visualization. So, don't just think that by moving the probe 90 degrees, they're going to pop up. Sometimes it takes a little bit of manipulation.

Now, continuing with identification, the next slide breaks this up a little bit more. Both inserts must be identified in the fundal transverse view to reduce risk of a duplicate image. That's the purpose of the I in OIL, to make sure that we see two so we don't label the right microinsert both the right and left by accident. A portion of each insert should be identified within the myometrium in each cornua. The linear axis of the inserts should appear relatively symmetrical, and in opposite directions, all, right? So, listen, if you have a transverse view and there's two inserts all on the right side, stop right there. One has to be on the right and one on the left. If there's two on one side of midline, she needs to go to definitive HSG, because that suggests an abnormality. And the location of these inserts on TVU may appear to be more distal than noted at time of hysteroscopy, but don't worry about that, because remember that at hysteroscopy, at placement, the uterine cavity is distended, and so the difference in visualization can look a little bit different. It's okay, and we'll talk

about this location, coming up next.

Well, here's what this image looks like, not in sagittal, because we shouldn't see one, but the first time these inserts come into play is in this transverse fundal view for identification. Here, which is the transverse fundus, and both inserts visible in the cornua. Now, don't get worried about giving somebody ability to rely based on this. This is not the job of this image. We just want to make sure that they're symmetrical, two are there, and they seem to be grossly in the correct position.

All right, now let's get into location, because location is really where it's at. Location will determine our three possible outcomes here, either satisfactory placement, optimal placement, or unsatisfactory. Now, in order for the patient to have reliance, the microinserts should be in either optimal or satisfactory, but if it's anything either than that, in other words, unsatisfactory, the patient should go to modified HSG for definitive confirmation testing. Now, the goal here is to determine the location of each insert with a targeted oblique view of each cornua. Now how is this done? Well, maintaining a transverse orientation of the probe, moving toward each cornua, and looking at it by the oblique angle, find the entire linear axis of each insert.

Each linear axis of each insert should be seen as a contiguous echogenic structure, without bend or kink. Mild pressure, sometimes it can be needed, to tug on the abdominal wall in order to get a better visual image. Now, if you suspect an unsatisfactory location, meaning it's got bend, it's a kink, or just can't get a good linear axis, a modified HSG is required. Now, the position of the insert within the cornu and the relationship of the endometrium and the SUTJ should be noted here. In other words, we can't just find each insert and say, "Well, they're there." It's relationship to the endometrial cavity and the UTJ is how we determine the three outcomes.

All right. Well, on the next slide, we go into this a little bit further. The image of a linear axis of the left or right is done, again, in the transverse oblique view. Make sure to label each one left or right accordingly. We don't want to duplicate an image, calling it the right when it was really the left, and get the same image twice. We have to demonstrate the linear axis without bend or break. Now, repeat the process on the contralateral side in order to find each microinsert category as either optimal, satisfactory, or unsatisfactory. Now, both inserts don't have to have the same category. In other words, one microinsert can be satisfactory and the other optimal, and that still allows for reliance. But, if one microinsert is unsatisfactory, she must proceed to a confirmatory test, that's a modified HSG. Let me say that again, both inserts do not have to have the same category. They both don't have to be optimal, or they both don't have to be satisfactory. One can be optimal and satisfactory, and that's okay for reliance.

Well, what does this mean, optimal and satisfactory or unsatisfactory? Well, it's on our screen now, on slide 29. Optimal means that the microinsert, the proximal end abuts or touches the endometrial stripe and is seen in one linear, contiguous shadow through the SUTJ without break or bend. Satisfactory means that the proximal end, while not abutting the endometrium, is still seen from within the myometrium and not past the UTJ. In other words, we can't have a suspicion that it's too distal. Either optimal or satisfactory allows reliance on the microinserts, and they do not require further alternative contraception. However, unsatisfactory does not mean the patient can't rely, it means she can't rely yet, until the modified HSG, the next step in the algorithm, is performed. Now, I want to clarify the slide, because it looks like the yellow is kind of cautionary there for satisfactory. It is not. Optimal and satisfactory are both good to go for reliance. It was just a nice visual, as we're all familiar with a typical stoplight sign.

Let's break this down a little bit more in the next slide, and take a look at optimal location. Remember, this is a transverse, oblique view of the fundus, and the image here is going to qualify or describe what I'm going to narrate. Each microinsert here, for optimal, should be seen in each cornu, each perspective cornu, with the proximal end of the insert abutting or touching the endometrium. The linear axis should be seen in a continuous line or shadow, without bend or break, transversing through and past the edge of the uterine serosa. That is optimal. So, optimal, it touches the endometrium, crosses through the SUTJ without break.

Now, what about satisfactory? Well, it's similar to optimal except the microinsert has moved away from the endometrium just a tad. In other words, the proximal end of the microinsert, now here it is, does not touch the endometrial stripe. However, it's still within the interstitial zone. In other words, it's still within the myometrium, and then transverses in the linear continuous shadow, without break or bend, through the SUTJ. And I can't say this enough, optimal and satisfactory are both okay for reliance. We all want the endometrium to touch the microinsert because it looks nice and makes us feel fine, but satisfactory is not inferior, it is okay for reliance.

Again, slide 32 kind of brings this back home, and this is a nice image of satisfactory. And you can put this in perspective to what we just saw when it touches the endometrium. As you can see here, the proximal end of the microinsert on the sonographic image does not touch the endometrium. However, as you can see, where the UTJ is, the serosal uterotubal junction, is past that proximal tip. In other words, it's about halfway towards the microinsert. This means that microinsert is still within the interstitial canal, transversing through the SUTJ and can still rely.

The last one is easy, guys. If it's not satisfactory or optimal, if it's not the either two that we've discussed, it's the red box. Any other variance outside of satisfactory or optimal is unsatisfactory, and the patient must proceed to a modified HSG. For example, if an insert

location is bent or kinked or we can't get a good linear axis or, of course, if one is missing, all of that is problematic and requires a definitive HSG for determination of reliance ability. Insert location is unsatisfactory if a portion of each insert cannot be visualized in the cornu in the transverse oblique view, in one scout image. All right?

So, let's take a look at this again in this other example. On the next slide, we see an example of an unsatisfactory location. Take a look at the sonogram image. Of course, we see the globular structure of the uterine fundus, we see the myometrium, but look where the insert is. That insert does not begin in the endometrial cavity; it is exterior to the uterine serosa. So, this is concerning, concerning, for distal placement. I didn't say it is distal placement, it's concerning for distal placement, and the only way to make that determination is with modified HSG.

All right, now as we move toward the end of our program, let's take another look at an unsatisfactory location. Well, this is just the opposite. Here, we see a microinsert not too distal where it's suspected, but too proximal. Here, the microinsert is totally within the endometrial cavity and still within the myometrial zone. So, we see it is not crossing the SUTJ. That's evident on the left image, but on the right image, when you see it in sagittal view, we said we shouldn't see any microinsert in the fundus, well forget that, this microinsert is in the endometrial cavity. This is a prime example of unsatisfactory, and they need to continue for definitive modified HSG.

Well, what about perforation? Remember we talked about at the beginning, in that sagittal orientation view, there should not be a microinsert seen in the midline. Well, take a look at this image. Here we see the endometrial stripe continuous with the endometrial stripe, but look what's continuous further on. Toward the fundus, we see the echogenic structure of the microinsert. They're all in one plane. Unless this microinsert is in the fundus, which is incorrect, this is highly suspicious, and the patient cannot rely and, then, needs to go on to modified HSG for definitive determination. During the identification step—remember, that's the transverse fundal view—if there's only one microinsert seen, or none at all, that also is unsatisfactory and she needs to go for further testing.

Well, talk about no microinserts, look at the next slide. This is a transverse view, and there is no scout image mobilization here. So, where is the location here? Where is the identification? It isn't. This is a transverse fundal view where the patient had two inserts placed, but no microinserts seen on ultrasound. That stops right here, and the patient must go to definitive HSG because this is unsatisfactory.

Well, let's now reemphasize the importance of how to manage an equivocal or an unsatisfactory TVU. If the TVU is equivocal or unsatisfactory, there is two things we have to remember. Number one, she has to proceed directly to that modified HSG for the definitive word, whether she can rely or not. But we have to counsel the patient that she has to remain on alternative contraception; she needs other backup birth control until that modified HSG says yes or no.

So, this is it, we're at the end. What's our summary? Remember the rules of three; there's three images, there's three tissue planes, and then there's three possible outcomes. The rule of three. The three images, of course, are the scout film in transverse fundal view, and then the right and left oblique transverse view for location. Those are our three images. The three planes to do this whole procedure are transverse, sagittal, and transverse oblique. And remember the three possible outcomes for OIL, uterine orientation, identification of the inserts, and then location of the inserts for our three possible outcomes of satisfactory, optimal -- both of those are okay -- or unsatisfactory.

And I told you at the end I would provide you with some resources for further training or education on this. We can always go to AIUM and get guidelines for basic ultrasound and interpretation. Also, the instructions for use of the microinsert provides these steps for more clarity. Remember to also go to esuremedicalresources.com to review this at your own time, and always remember you can contact the representative of the microinsert for further training or resources to help us do this correctly.

Thank you for your time, and thank you for your attention.