Chapter 13, which is basically the breast and female reproductive system. All right. So the breast is a modified sweat gland, basically, specialized to produce milk for nursing infants and there's two main types of tissue. There's the glandular tissue and then there's the stromal tissue, the supporting tissues, and it's the supporting tissues that give the breast the size and shape, all right, and the glandular tissues basically are broken up into lobules and then smaller areas of ducts. And let's see, so -- and then the changes in the breast are either benign or non-cancerous changes or the malignant or cancerous changes. There's also minor changes with pregnancy and lactation. So the breast is basically composed of 20 lobes of glandular type tissue. All right. And then there are branching ducts that drain the lobes and lobules, okay, to bring the milk to the nipple, and also there's -- within the breast there's going to be some connective tissue, some adipose tissues, blood vessels and lymph.

As I mentioned before, the stroma contains ligaments, the suspensory ligaments, which are bands of fibrous tissue, that give the breast part of its shape and also connects it to the chest wall muscles. And of course there's abundant blood supply and lymphatic drainage to the breast. And the lymph nodes are very significant in diagnosing or staging breast cancer, all right, as to which lymph node, group of lymph nodes are positive, if they have tumor metastasis, and underneath the arm is one group, the axillary group, supraclavicular is above the clavicle or the collarbone, all right, and also there's mediastinal nodes, nodes within the chest, which obviously are not that accessible, but are easily visualized with CAT scan. So breast cancer cells reach the axillary nodes and continue to grow. The nodes swell and the cancer becomes more likely to spread to the other organs. There's different levels. Usually there's different levels of axillary nodes. Closer to the lump and then further up into the axilla or armpit. Okay?

So the breast, what happens in puberty, it enlarges in response to estrogen and progesterone, and post pubertal changes, there's proliferation of the glandular tissue, fibrous tissue and accumulation of adipose tissue. As you all know, there's going to be variations of breast size, depending on the amount of adipose and fibrous tissue that's present. All right? Much more than the glandular tissue. Grandular tissue doesn't really affect breast size that much
and of course the breast is responsive to hormonal stimulation, right? The menstrual cycle, which we'll go over later on in the chapter, and then, of course, pregnancy and lactation with hypertrophy of the glandular elements and ductal tissue, and then after menopause, the estrogen levels fall, they decline, and the breast also can change. All right. So here, all right, on the left you have the normal non-pregnant breast, and the purple areas, okay, are going to be the ducts. I'm sorry. Actually, are the glands. And then the white area is the adipose tissue. Then the middle, you'll see the increased number of glands, and that's glandular hyperplasia. Remember the term hyperplasia is increase in number, all right, and then on the far right is the post-menopausal change associated with decrease in estrogen levels. So the glandular content of the breast does change. There's more stroma present, and if you notice on the top right, there's still the adipose tissue, okay, that clear tissue up there, that clear area up there is going to be adipose tissue, same with the lower left.

All right. So mammogram, all right, what's the story on mammograms? The recommendation for a mammogram is basically age 35, okay? The first mammogram should be done at age 35, and mammograms are a screening tool. The incidence of breast cancer, the author quotes one out of ten. There are other authors and other statistics that say it's one out of nine, okay, for the purpose of this class, we're going to say one out of ten. All right? But if anybody tells me one out of nine, then, you know, that's acceptable, too. But for this class, we're going to say one out of ten. So, and to bring it close to home, one out of ten means one woman out of ten women in their lifetime, okay, will get breast cancer, and being more realistic, there are more than ten women in this class statistically, so it's a very scary statistic.

So the purpose of the mammogram is to detect abnormalities, and the mammogram works best at detecting masses or tumors within the breast. They tend to appear more white on the mammogram. And as I mentioned, the screening age starts at 35. Now, women with a family history of breast cancer may start their mammograms earlier. Might start them at 30. All right? And so sometimes that's sorta individualized, and part of the reason for that is because of patients' anxiety. Cancer in the breast feels like a stoney, hard pebble. It's a rough -- it's like, you know, you walk in the parking lot and you pick up a stone, that's what it feels like in the breast, all right? It's a stoney, hard, rough texture to it. Benign lesions are very smooth, okay? They're very smooth.
They tend to feel like an almond or a pea in the breast. And we'll go over a breast exam in a minute. The malignant tumors, they have irregular borders. That's part of the reason why they feel jagged, and on mammography, you can see the irregular borders and they sometimes contain flecks of calcium. However, a benign mammogram can also have flecks of calcium, so that's not a great diagnostic factor. So on the right, you'll see the tumor, that white stellate appearance, okay, and then on the left, basically you see the breast with the darkness basically is the fatty tissue. Okay? Adipose tissue.

Now, here, all right, the arrow points to some calcification within the tumor. Notice the irregularity of that, and then on the right, you have the microscopic stain. It's probably an H & E stain and the arrows point to the areas of the cancer that has some necrosis and then calcification. So let's see, and we'll go over more about lumps in the breast in a little bit. So abnormalities in breast development, embryologically, the breasts develop from a column of cells. They call them mammary ridges, and they're anterior on the chest wall, and they extend basically from the axilla, the armpit, to the upper thighs, and most of them disappear during prenatal development, all right, except for the mid thoracic area, giving rise to the breasts and nipples, and of course this is going to be in men and women.

Occasionally, all right, people can have accessory breasts and nipples. They're most commonly found in the armpits or the lower chest and below the normal medial breasts. Also, there can be asymmetric development of the breasts. Okay? So the breasts start to enlarge at puberty, okay, and normally both respond to the hormonal stimulation. Gynecomastia is the term that we use to a rudimentary type of proliferation of duct and fibrous tissue behind the nipple in the adolescent male. It's due to hormonal changes that go on with puberty. Body builders who take a lot of anabolic steroids also may develop gynecomastia. And sometimes it's there for a long time and they'll have it removed. And what they do is they make like a semi-lunar, semi-circular incision right around the edge of the nipple and then it can be removed. Also, cirrhotics, severe alcoholics, men who are severely cirrhotic may have some gynecomastia, too, due to the hormonal changes that occur from the poor functioning of the liver.

All right. So here is the nipple line or the common -- the ridge where you can have accessory breast tissue. The breast tissue is really not common at all, but occasionally, you can have an accessory nipple and it may look like just a simple little mole or increased pigmentation, all right, but if it's in the line, that line, then it's likely that it
could be a nipple.

All right. So anyway, benign cystic changes in the breast. Let's see. What I'd like to go over now basically are the types of lumps in the breast. There's basically three types to be concerned about. One is -- three types that come for diagnosis. One is fibrocystic tissue. The second is a fibroadenoma, and the third is breast cancer. Okay?

So the first, the fibrocystic breast tissue, tends to occur in the upper outer quadrant of the breast. Right? And what happens is it tends to respond to the hormones of the cycle. So that right before the period's due, okay, is when fibrocystic breast tissue is the most tender, and at that time, the breast in the upper outer quadrant may feel a little bit lumpy or irregular, and then after menstruation, that lumpiness and that discomfort goes away. Okay?

Now, fibrocystic breast tissue, some women have a lot of fibrocystic breast tissue, some women don't. The best way to do self breast exam is that self breast exam should be done once the period is immediately over. Okay? Because at that time, the breasts are least, or less stimulated by hormones than any other time. And the way to do that is in a reclining position, lay in a couch or bed. You're going to examine the left breast, you put the left hand behind your head and what I always tell my patients, start the nipple, squeeze the nipple, look for any type of discharge, all right, bloody, clear or milky white, and there should really be no discharge. And then you think of your breast as a clock and you run your fingers out. Start at the nipple. You go to 1200, 1:00, 2:00, 3:00. The American cancer society recommends starting at the nipple and then going out in a circular motion. Sometimes with the asymmetry of the breasts, I'm concerned about when people -- patients missing a lump, so I think it's better if you think of it as a clock and you walk your fingers out.

When you get to the armpit you have to go all the way up into the armpit because there's a tail of breast tissue that extends into the armpit, so you need to make sure you walk your fingers all the way up there. Now, when should you start breast -- self breast exam? It should be started now. When I was in practice, I used to have women who were in their 50s and even 60s come in to me in a total panic, they had never done self breast exam before. They had a sister who was diagnosed with breast cancer. They realized that having a sister with -- diagnosed with breast cancer increased their risk, and they wanted to do self breast exam but they were so anxious about it, you know, will I find something, what if I don't, that they couldn't even do it so the best time to do it is starting now, and do it right after the period is over.

And then when you do it, you may diagnose a lump or you may
feel fibrocystic breast tissue. Okay?
So anyway, what fibrocystic breast tissue is, it's a benign condition, and it's areas of proliferation of glands and fibrous tissue and it responds to the hormones of the cycle. The best way to diagnose fibrocystic breast tissue is probably by ultrasound, and especially if it's a cystic type of lump. Ultrasound works well in diagnosing fluid-contained cysts. It doesn't do well with breast cancer. All right? Obviously breast cancer can occur at any age group, but for women in their 20s or 30s, breast cancer is not as much of a concern as it is for women in their 40s and 50s and 60s.

And then if a cyst is determined by either palpation or by ultrasound, they can put a needle in it, aspirate, take the fluid out. When they take the fluid out, it will contain cells in the cysts and then can be examined under the microscope to see whether they're benign or suspicious or malignant.

And the breast, the care of the breast is a very litigious area, I think it's getting better now, but part of the problem is that sometimes it's interpretive. And the best way to avoid, and this is a generalization for all medicine, the best way to avoid all lawsuits is to have a tissue diagnosis, okay? You have a tissue diagnosis. Years ago not now, but years ago, women would come in and they would tell their doctor that they thought they maybe had a breast lump and the doctor would say hey, you know what, I feel what you're feeling, I think it's benign, come back in six months or three months. They come back at three months later and it's grown, or six months later, and it's proven to be breast cancer. Insurance companies don't even take those cases to court. They just settle with them outside because any lump in the breast that really persists for more than a cycle needs to be biopsied, and the way you can do a biopsy is a fine needle aspiration. It's an office procedure, fine needle the size of a hair, goes into the lump, they attach a syringe to it and then they back on the syringe with a negative pressure, they get a little bit of cellular tissue, some plain cells. They're then examined by the pathologist and he can determine right there whether it's benign or suspicious.

And then once you do that, then the patient has peace of mind and you know better how to counsel the patient. Okay? So that's aspiration of the cyst, or surgical excision. Now, fibrocystic breast tissue tends to be cystic. Patients of ours who have it, what we would do is we tell them to cut all their salt out, drink a lot of water. No caffeine since those things seem to make fibrocystic breast tissue worse. And as long as there was no dominant lump that we're concerned about but just an area of the breast that felt
lumpy, we then would have them come back after their next period and examine them and if the fibrocystic breast tissue is still there, then we would do diagnostic tests, but if it was resolved or better, then we basically felt confident that we had established diagnosis.

The next lump in the breast is a fibroadenoma. The fibroadenoma is a benign tumor, and that's the one that feels like a lima bean underneath the skin. Sometimes they can get large. And basically a fibroadenoma should have a fine needle aspiration, confirm the fact that it's a fibroadenoma and then counsel the patient. They tend to occur in young women in their late teens, 20s and early 30s. And with fibroadenomas, there's no relationship with cancer. So a woman has a fibroadenoma is not at risk for getting breast cancer.

Now, there are some women who have a tendency to form fibroadenomas in their breasts, so the first fibroadenoma most the time women want to have removed. They don't want to have a lump in their breast. And sometimes very often the second one. By the time the third or fourth one forms, if, you know, the patient develops several of them over time, they may opt to not have them removed, but establish the diagnosis with a fine needle aspiration and then maybe do mammograms a little more frequently because every time you remove a fibroadenoma from the breast, there is some scarring, and there can be some deformity to the breasts. It's minor, but it can add up. So a fibroadenoma is basically benign. Most the time they're surgically removed and the patients are fine. It's rare that someone develops recurring ones but I have seen patients like that. The third lump is breast cancer. Okay? And that's what you screen for with mammography. If they have a positive mammogram, depending on the interpretation of the mammogram, they can go straight to surgery or -- and we'll talk about the ways that breast cancer is dealt with. Okay? Sometimes they'll get a fine needle aspiration to confirm it.

Let's move on here. All right. So here they show you a section of the breast, that the yellow is the adipose tissue with the cyst present and there's the ultrasound, and that cyst looks like it's just about a centimeter. Okay?

And the ultrasound of the breast cyst.

Then this is the fibroadenoma. Now, what I want you to notice is notice how really relatively well defined the borders are. Okay? Remember I told you with benign cancer, it expands. It pushes in on bordering tissue, surrounding tissue, but it doesn't invade. It's common in young women. Typically it's surgically excised and it's made up of glandular tissue. That's the adenoma term and fibrous tissue, which is the fibro. All right? Hold on. I thought I had a picture here.
Here we go. This is a picture of breast cancer. All right? Notice the contrast between that and the fibroadenoma. The fibroadenoma has well-defined margins. You can tell where it starts and where it stops. With this, you can't tell where it stops, and so we call the stellate lesion. It has tendrils that are extending, okay, it looks like there is a tendril that goes all the way out at 7:00. Okay? Typically with breast cancer, if you're going to do an excisional biopsy, you want -- your biopsy has to be larger than the anticipated size of the tumor because there's always going to be microscopic extension. And basically, when you do a biopsy like this, you want the pathologist to look at it and say that all the margins were clear of cancer. So you don't have to go back in and remove additional tissue. All right. So we'll go back here now. Okay. So that's the fibroadenoma. Once again, you can see the difference.

And then all right. Risk factors for breast cancer. Familial tendency. Mother and sister with breast cancer. Increased risk of breast cancer of a first degree relative has it. That's going to be the mother or sister. Grandmother is considered a second degree relative. Aunt is considered a second degree relative. Hormonal factors, certain hormonal factors that increase the risk of breast cancer. And what that is is first child after age 30, early period, onset of early periods, late menopause, all right. And the reason for the whole hormonal factors in the birth of her child after age 30 is that the breast is a hormonal organ, and then it responds to the cycles of the hormones. And so what happens is with the normal menstrual cycle. I'm going to go into this now, although this will also relate to the discussion later on in the chapter about reproductive organs. But with the normal menstrual cycle, we're going to say the normal menstrual cycle is 28 days. The first day of the cycle, the way we count it, the first day of the cycle is the first day of the menstrual bleed. Menstrual bleed occurs a couple days, and then it stops. Okay? So once the menstruation, right at the end, what happens is the hypothalamus says you know what, we got low estrogen levels present. We need to stimulate the ovaries to produce estrogen. So it stimulates the ovaries with FSH. Anybody know what FSH stands for? Right. Follicle stimulating hormone. So really we say it stimulates the ovaries, but the better answer is that it stimulates several of the follicles that start to grow. As they grow, they start to produce estrogen. Okay? So initially it may be seven follicles respond to the FSH, and then a couple days later, two or three of them die off. So we're left with four. But the body is still producing the anterior pituitary is still releasing FSH so these follicles are growing. The purpose
of them growing is to get ready to ovulate and release an egg that's capable of being fertilized. So we have a 28-day cycle. We're going to say classically ovulation occurs on day 14 and the FSH keeps on increasing the production of estrogen. Finally, two or three days before ovulation, the estrogen levels are very high, and that high estrogen level triggers what we call the LH surge. LH stands for luteinizing hormone. The LH surge occurs and then that triggers ovulation. So then one follicle is more dominant and more mature than the other follicles, and that releases the egg, okay? It releases one egg. And then what happens is the follicle that released the egg changes. It starts to shrink in and what we call involute. It has a yellow characteristic color to it and it becomes the corpus luteum. So from menstruation, the first day of menstruation to ovulation, we have estrogen present. Once ovulation occurs, that corpus luteum, the shrunken follicle, still produces estrogen but produces another hormone progesterone. Okay? Estrogen causes the lining of the uterus, which we call the endometrium, to grow. Progesterone causes the endometrium to mature and differentiate into mature cells so it's ready to receive a fertilized egg.

Okay. So the second half of the cycle, you have estrogen present and progesterone. Progesterone counteracts the effects of estrogen. Women who take prolonged estrogen without progesterone around, all right, they have continuous stimulus of the lining of the uterus and it can cause the lining of the uterus to become cancerous.

So now, for women who conceive their first child after 30, after 35, they have an increased risk for breast cancer because what happens is we postulate, is the cyclic stimulation of the breast that increases the risk of breast cancer.

For example, a woman who's 28 gets pregnant, okay. Once she gets pregnant, she doesn't have that waxing and waning of estrogen levels. The estrogen levels fall when they get their period, and then it goes up real high and then it comes down a little bit and then it falls, and -- okay, and of course I don't know -- I don't think I said this, but then after that ovulation, estrogen and progesterone produce for 14 days. If an egg doesn't get fertilized, hormone levels fall and when that fall occurs, there's the hormone withdrawal and onset of menstruation. So a woman who gets pregnant, okay, pregnancy is for nine months, all right, and then once they deliver, they don't get a period for at least six weeks, sometimes two or three months after delivery, and sometimes they're going to breast feed or nurse. If they're going to do that, they may not get a period for six months or a year.

So we postulate that that interruption of the menstrual
cycling decreases the risk for breast cancer. So women who don't have a child before 30 or 35, they have a child later on in life, have a great risk because they have more exposure of that stimulation. Same thing for women who start their periods at a very young age. They have a longer time of hormonal stimulation of the breast.

All right. Any questions on that?

Okay. Now, so hormones have been used for many years to treat menopausal symptoms. Yes.

All right. So let's talk about the menopause for a minute. Menopause is defined as one year without a period. Okay?

So in women, when they become menopausal, all right, their periods stop, and they have menopausal symptoms. Now, what are some of the menopausal symptoms?

>> STUDENT: Hot flashes.

>> PROFESSOR: All right. Hot flashes. Right. Hot flashes are where they suddenly become hot from the neck up. Absolutely. What else? Yes? I'm sorry. What?

>> STUDENT: [Inaudible].

>> PROFESSOR: Mood swings. Great. I'm glad a female student said that.

[Laughter]

Yes. Mood swings have been reported. Okay? Women in menopause will tell you they have mood swings. Absolutely. What else?

>> STUDENT: [Inaudible].

>> PROFESSOR: Who said that? Yep. Lack of sleep or difficulty falling asleep or they fall asleep, and then they wake up, so they can have disturbed sleep. Absolutely. What else? A couple other ones. Significant. One is night sweats, all right, they can wake up in the middle of the night and their pajamas, what they're sleeping in is totally saturated, okay, and they have to change their clothing, sometimes they change their sheets, whatever. So that is also a problem. It's called night sweats. And what else? Anything else? One more I'm thinking of. Actually, there's two more risks for menopausal women.

No menstruation because menopause is one year without a period, okay, so they have low hormone levels. But what are the consequences of low hormone levels? There's two still.

>> STUDENT: [Inaudible].

>> PROFESSOR: Good. Osteoporosis is one, and that's decrease in bone density, and typically the areas where the bone density decrease occurs is going to be in the wrists, spine, and also in the hips. So women who are post menopausal will sometimes have a bone scan to determine bone density.

All right. And of course with the osteoporotic changes, the greatest risk for women is a hip fracture, okay, because what happens is the head, or it's not the head, but it's the
neck of the femur bone, becomes -- the bone becomes so thin it becomes brittle, and we used to think that they would fall, or actually the hip would -- they would fracture their hip and fall, but now we know that the fracture occurs first, and then they fall afterwards. And so what happens is it's so brittle that it just breaks. And the concern about that is if you have a fractured hip, the treatment for that, the correction of that in the older age group, they become immobilized, and they're bedridden for a month, two months, and then they get permanent problems, they get a pneumonia, and there's a high mortality rate associated with fractured hip.

So another thing affects the spine. For example, anybody here have a grandmother who says that since she's gotten older, she's shrunken? Her stature has decreased a little bit? Okay. Some of you have that. Okay. And the reason why is because with the osteoporotic changes in the spine and the vertebral body, they tend to shrink. The bones get compressed.

Another interesting thing you can do, which I notice all the time, and I guess it's because I'm a doctor or a physician, but if you're in line at the food store, if you have an older woman, late 60s, early 70, in front of you, just look at her back. Is it totally symmetrical? Very often when you look at their back, you'll see one shoulder is a little higher. Okay? Or they may have like one of the scapula's more pronounced, or there may be a slight curvature to the spine. That's all due to osteoporotic changes.

Sometimes with severe osteoporotic changes, they have their that he had goes forward, and they can't really get their head up the whole way. All that's due to osteoporotic changes.

So the treatment for that is medications they can take, okay, which reduces the risk of osteoporosis. Sally Fields is always on TV advertising one called Boneva, and now there's a shot available, and also an intravenous medication that's given every six months. And the problem with the medication is that it upsets their stomach and they have to stay in an upright position for an hour to two hours after they take it. So some of them opt for the IV medication. So that's osteoporosis.

The other consequence for menopause is decreased vaginal lubrication so that when women have intercourse, it's more painful because they're less lubricated.

So these are a lot of complaints that really do change the life of a menopausal woman. And so one of the ways to treat that is to treat them with estrogen. So we used to give women estrogen replacement therapy called ERT, all right, and they would take a little bit of estrogen every day. And then, like the last seven days, the last ten days, they take
a little bit of a progestin. Progestin is similar to progesterone. Remember I told you progesterone counteracts the effects of estrogen. So as a result, sometimes they have a little bit of spotting, sometimes not. And then the recommendation was changed to giving them a combined pill, low dose amount of estrogen, low dose amount of progestin every single day. And it would be -- it would raise their estrogen levels a little bit, so it would retard osteoporotic changes, vaginal lubrication would improve, they wouldn't have night sweats or hot flashes.

When I was in practice, my office was right in New Jersey, right at the G.W. Bridge so I used to have patients who had very high profile jobs in the city, and they would tell me that they felt that they were losing ground to their, you know, male counterparts because of the menopausal changes, like, you know, if they woke up twice during the night on a regular basis, their sleep was interrupted. They didn't feel as sharp when they went to work. They were embarrassed sometimes if they had like a hot flash in a meeting. So we would place these patients on estrogen and progestin therapy. They'd feel great and they were very happy. However, what happened is we found out that combined hormone therapy, estrogen and progestin, increases density of the breasts, it complicates the interpretation of mammograms and it increases slightly the risk of breast cancer. So as a result, it's not recommended. You can get it for very short term, patients be aware of the risks, but that's it. The ideal patient for the menopause basically is a woman who has had to have a hysterectomy, so she doesn't have a uterus, and you can put them on low dose estrogen without the progestin component because they don't have a uterus and they don't have an endometrium, and as a result, the risk of breast cancer is only slightly increased by 1%. All right. So that's significant. Any questions on that? I went through it fast. Any questions? All right. Good. So now, another risk factor is the BRCA gene. I've mentioned it. It increases the risk of breast cancer 80%. All right? So it's two different gene mutation and a different chromosome, and the risk for breast cancer increases 80%. BRCA 1 increases the risk of ovarian cancer 20 to 40%. BRCA 2 increases it 10 to 20%. I had a patient who came to me and she was 32, and her sister was diagnosed with breast cancer, and this patient was a patient of mine. We delivered her three times, and her sister was tested, and she had the BRCA 1 gene and she was tested and she had the BRCA 1 gene also so she felt like she was doomed to have breast cancer. And so she came for a consultation because what she wanted to have was a bilateral prophylactic subcutaneous mastectomy with implants. Basically, because of the risk of breast cancer, she wanted to have her breast...
tissue removed, okay, and have breast implants inserted. And she felt like she was doomed to have breast cancer, and she wanted to be there for her children and raise her children. So we talked about all the risk factors. She went to see a plastic surgeon, and she had the surgery. And she's still doing well now.

Anybody know any celebrity that's had that procedure done? Because there is one. You know what, she might have had that. I'm not sure. Okay? I know she was diagnosed with breast cancer, I did hear that. Christina Applegate, okay, she was diagnosed with breast cancer. She carries the BRCA gene, so she elected to have the replacement surgery done. And so she's doing well.

All right. So let's see here. Clinical manifestations. Typically breast cancer presents as a lump in the breast. The breast cancer is fairly extended or aggressive. It's been there for a while before it usually causes nipple retraction or the texturing of the breast. It's called potolounge or skin of the orange, orange skin, and you see a picture of it. It's basically due a little bit to the edema, and it effects the skin. The tumor infiltrates the breast, and it can become fixed to the chest wall, and affects the ligaments so it can pull on the nipple. So a change in the nipple from being everted to inverted may be a warning sign.

All right. So most of the breast cancers are ductal carcinoma. All right? It's a cancer of the ducts, and the ducts are lined by epithelial tissue. Remember I was going to tell you, too, that ductal cancer or ductal carcinoma can be in situ. The two most common sites are of the cervix and the ducts of the breast, okay, where in situ cancer occurs. And with in situ, it's confined initially to the ductal lobule, but the concern is that it becomes invasive and extends to adjacent breast tissue. Now, I mentioned this in another lecture. I told you it's difficult to follow. You can diagnose ductal carcinoma in situ but how do you follow it? It's hard to follow with mammography. So basically, if there's no invasion, which means the tumor extends beyond the basement membrane, then we call it in situ.

So, of course, when the biopsy is done, you have to know whether it's well differentiated cells, which means it may not be that well aggressive, or they may be poorly differentiated, bizarre-shaped cells, that are much more aggressive.

All right. So the evolution of breast cancer. Of course, it starts from a small area, and it gradually enlarges. The feeling is that mammography can identify breast cancer up to
two years before it's palpable. Okay? As I mentioned, it can spread to the lymph nodes. Our cure rate with breast cancer is very, very good, and that's due to great treatment, aggressive treatment and early detection.

All right. Now, let's see, so the treatment for breast cancer used to be a radical mastectomy. Radical mastectomy is where they removed the breast, the pectoralis major and minor muscle and the lymph nodes. Gradually Taylor made to depending on the size of the lesion and the location of the breast. Greatest -- highest percentage area of -- in the breast with breast cancer is going to be the upper outer quadrant.

So the modified radical is where they take -- they remove the breast with the axillary lymph nodes, but they leave the pectoralis muscle.

All right. Partial mastectomy refers to removing only part of the breast with the tumor. When they call that a lumpectomy. When they do that, okay, they remove the axillary lymph nodes, and they will give radiation to the breast. Okay? Because when you leave part of the breast, the concern is there may be another early lesion there. All right? And sometimes they will give the patient chemotherapy.

All right. Now, chemotherapy, it's given to eradicate any tumors that may have spread beyond the breast. There's basically two types, anticancer drugs, which we call adjuvant chemotherapy, and anti-estrogen drugs, which are adjuvant hormonal therapy.

And one -- what happens is when breast cancer's removed at the time of surgery, it's sent to the lab, and the diagnosis of cancer is made, and they analyze the tissue for receptors. The receptors are talking about are the HER-2 receptor and estrogen receptors. Now, estrogen receptors on the tumor, what that means is that when they're circulating estrogen, it can bind to the tumor cells. The tumor cells have receptors to bind to the estrogen, and then that stimulates the tumor cells to grow. So one of the anti-estrogen drugs is tamoxifen, and what tamoxifen does is it binds to the estrogen receptor on the tumor. By binding to it, it blocks estrogen from binding to the receptor. Okay? And so that's tamoxifen.

Also, the HER-2 gene, which speeds the rate of growth, the HER-2 tumors have a less favorable prognosis. So typically, this is a generalization, but the hormone receptor positive tumors are better differentiated or more well differentiated so they're a little less aggressive so they may have a favorable prognosis.

All right. So basically whether the tumors have the hormone receptors is also used as a guide for treatment.

All right. Now, recurring metastatic carcinoma. Breast
cancer, metastasis can appear sometimes many years after the original diagnosis. Okay? You can think the patient is cured. They can be clear for five years, and then it can pop up. In a node or in a metastatic site. And at that time, it's difficult to cure it so you just try to control it.

And you can -- so methods of treatment will depend on the following factors, whether it's positive for receptors, the age of the patient, and how long the time difference from the initial treatment to metastasis.

All right. And also there are aromatase inhibitor drugs, and what they do is they inhibit the production of estrogen in the post menopausal woman from other steroids and other hormones, okay, because in the post menopausal woman, some corticosteroids or estrogen derivatives may be metabolized by the enzyme aromatase 2 estrogen type drugs. Hormones. So that's another way to treat it.

All right. And of course there's still tamoxifen. And local diagnosed metastatic areas can be treated with radiation.

So a lump in the breast, we basically have talked about this. Diagnostic possibilities, fibrocystic disease, fibroadenoma or carcinoma, and basically it needs to be diagnosed. It can either be diagnosed with a fine needle aspiration, which in some ways is a biopsy, or mammography. Okay. All right. Now, moving on -- any questions on the breast? No? Okay. Then we're going to do the female genital tract, vaginitis refers to an inflammation of the vagina, usually associated with discharge. Common organisms are candida albicans, trichomonas vaginalis and Gardnerella. Candida albicans produces -- yeast forms and it produces a thick, white type of discharge with vaginal and labial type itching. Trichomonas is caused by an organism with a flagella, so you can diagnose, take a sample of a discharge is look at the sample on the microscope and you see the organism moving because of the whip like nature of the tail, the flagella. Gardnerella is a bacteria. It's also given the name non-specific vaginitis, and that can be diagnosed by a look underneath the microscope.

The term cervicitis, inflammation of the cervix, is sort of going by the boards. We don't use it that much anymore. The real curve with cervicitis is if it's HPV related, okay? Human papilloma virus. HPV. What's the name of the vaccine against HPV, guys? Gardasil. What strains does Gardasil cover? It's a quadrivalent vaccine so it covers four strains of HPV. Six, 18 -- 6, 11, 16 and 18. Okay? So the six and 11 are responsible for venereal warts caused by HPV, venereal warts. The 16 and 18 are responsible for cancer of the cervix. All right? Yes. Okay. I'm sorry. I thought you had a question.
All right. So also, infection of the cervix can be caused by gonorrhea or chlamydia, and the concern is that, as mentioned before with gonorrhea or chlamydia, if it spreads to the tubes, it can cause a PID, pelvic inflammatory disease. We call that inflammation of the tubes salpingitis. When inflammation -- aorta more technical name for PID is bilateral salpingo-oophoritis. Okay? Salpingitis or oophoritis, inflammation of the tubes and ovaries.

All right. And so typically a PID will present with lower abdominal pain and tenderness. Sometimes fever. Sometimes leukocytosis. Leukocytosis, you first see an increased in white blood cell count. And the surgeons used to call the gynecologists in. I've been called in many a time to rule in a PID or rule out an appendix. All right? Because women come in with lower right quadrant pain, lower right quadrant. What's in the lower right quadrant? Basically the appendix, and also the tubes and ovaries. And if it's an appendix, it needs to be treated with surgery. Laparoscopic surgery. Hasn't ruptured, they can take it out. If it's a PID, it needs to be treated with antibiotics. So I used to be called in a lot to help do differential diagnosis.

And the concern with gonorrhea and chlamydia is it starts in the cervix and spreads to the tubes. When you get PID, you can get scarring of the tubes. When you get scarring of the tubes, it interferes with movement of the contraction of the tubes, and therefore, the concern is that women, when they ovulate, if the egg gets fertilized, normally fertilization occurs in the tubes, and the fertilized egg travels down the tubes to the uterus and implants in the uterus. With PID, and scarring, the fertilized egg can implant in the tube. When that happens, if it implants, it starts to grow, increased blood flow to the tube, and then eventually it ruptures the tube. When it ruptures the tube, women start to bleed internally, into the abdomen, and it can be a surgical emergency. Okay?

Every year, women die of a ruptured ectopic pregnancy in Florida. All right? They can be difficult to diagnose. And sometimes they have no symptoms at all. So when -- and the word ectopic means in an abnormal location. All right? So you can have an ectopic pregnancy. Sometimes you can have ectopic tissue. Okay? We mentioned, I think, the benign teratoma under tumors, and that has -- that can have hormonal tissue in it, thyroid tissue in it, and it's not supposed to be there. So ectopic means in an abnormal location in the body. We used to treat all the ectopic pregnancies with removing the tube, and then we've refined our skills, and now we very often don't have to remove the tube. If it's a ruptured, it's difficult to repair the tube.
totally, lots of times it has to be removed. But if you can
diagnose it without it being ruptured, we used to be able to
treat it very successfully with laparoscopic surgery.
Laparoscopic surgery, you make a small incision in the belly
button and you put a scope in, and in the lower right and
left quadrants you make a small incision about a quarter of
an inch. You can introduce two trocars and then we were
able to open up the tube, remove the pregnancy contents and
close the tube and patients go home the next day.
All right. So condylomas, HPV, venereal warts in the
genital tract. Let's see, common locations for warts, as
you know, the vagina, labia, around the anus, on the cervix,
and the treatment for these warts is to destroy them. They
can be destroyed with an acid called podophyllin, they can
be burnt with lector coagulation, they can be lasered, they
can be frozen, or if they're on the cervix and they cause
abnormal cervical tissue, they can be removed surgically.
Here's an example of a uterus with PID. Those tubes on the
right and left are very dilated. What happens is they get
scarred, and then they become sealed, and the secretions
stay within the tube, and they get kind of blown up, so
those are what we call hydrosalpinx, bilateral hydrosalpinx.
On the left you see the tube and the uterus sort of in the
middle. And what's in between the tube and the uterus, that
whitish area, is going to be an ovary. Okay? And then the
picture on the right is a cervix and what we call warty
excrescences. This person has HPV and she has warts on the
cervix. Endometriosis. Endometriosis is the condition
where the lining of the uterus, which is the endometrium, is
located outside the uterus. It can be on the surface of the
uterus, can be on the tubes, the ovaries. Typically women
with endometriosis have increased menstrual pain, and the
reason being that we postulate is that the spots of
endometriosis are hormonally sensitive so when women go
through menstruation, the hormone withdrawal, they have the
hormone withdrawal and they have menstruation occurring,
these little spots of endometriosis also release blood into
the peritoneal cavity and cause pain. All right? It can be
-- I mentioned the ovary, the tubes, it can be on the
outside. It can be the appendix, it can be in the rectum.
It can be in a lot of different areas within the pelvis.
Okay?
And the concern is that repetitive episodes, or pain with
endometriosis can cause scarring and obstruction of the
fallopian tubes. Best way to diagnose it is to see it. You
can suspect it by history, but you don't know if it's there
or not unless you actually take a look at it. Okay?
Treatment. The best way to treat endometriosis is with
birth control pills. Okay? I'm going to go over just a
minute with you guys how birth control pills work.
All right. The typical pill that is prescribed today is a very low dose pill. What's low dose mean? It has a low amount of estrogen in it and a low amount of progestin. Remember, I told you really can't give estrogen without giving progestin to a woman who has a uterus. So the way the pill works is the pill causes birth control in three ways. Number one by taking a little bit of estrogen every day. There's adequate estrogen in the circulation so the hypothalamus, which is like the thermostat of the body, what that does is says hey, there's enough estrogen today, we don't have to cause the release of FSH to stimulate follicles to grow because there's adequate estrogen. We don't need to encourage them to produce estrogen. So the FSH levels stay low. All right? A little bit of estrogen meets the body's needs.

Now, also there's a progestin component. The progestin component in the pill every single day, what that -- the progestin component does is it's like progesterone, but it causes the lining of the uterus to shrink. Okay? And so the pill causes birth control, number one, by taking estrogen every day. You keep the ovaries at rest, the follicles at rest so you don't release an egg. If, by chance, an egg is released while on the pill, what happens is the progestin component shrinks the lining of the uterus, and as a result, there's no lining left for -- healthy lining left to nurture a fertilized egg, so it cannot receive a fertilized egg.

And the third way it causes birth control is that it causes the cervix, the mucus in the cervix, to become very thick and tenacious, so that it's difficult for the sperm to swim through that thick mucus and get into the tubes. Okay? So it suppresses ovulation, shrinks the lining of the uterus, and makes the cervical mucus very thick and hostile to sperm.

Now, when you've been on the pill for a while, what happens, the period usually lightens up. It lightens up sometimes one or two days of spotting. And so by treating endometriosis with birth control pills, it causes those endometrial implants to shrink, and the withdrawal bleeding decreases a lot.

So basically that is the best way to treat it. There are other drugs that can be taken also. Basically to stop the cyclical estrogen and progesterone stimulation. But birth control pills work really well.

All right. So here is a condition with adenomyosis. The condition of having endometrium in the wall of the uterus is really called adenomyosis. Adeno is glands, myosis is muscle.

Now, this is a specimen that contains a clear-cut, basically, cyst, chocolate. We call it chocolate cyst.
because it contains old blood from areas of endometriosis, all right, within the uterine wall. It shows you how thick the uterine wall is.

All right. Now, the cervix can have polyps. Polyps are usually benign. They can be small. The problem with a polyp is if it grows, sometimes the tip of it becomes eroded and may have some bleeding. Also you can have bleeding after relations. It's removed surgically. It's really not a big issue.

Cervical dysplasia refers to abnormal cervical squamous -- stratified squamous epithelium. And we grade the abnormal stratified squamous epithelium in mild, moderate and severe. And if, like the upper third is a little abnormal, that's mild. If it extends more, it's moderate. If there's full thickness abnormality, then we say that that's severe. Okay? And typically, mild dysplasia results from inflammation or irritation. It can respond, regress spontaneously. Severe usually does not regress, and the concern is that if severe dysplasia is present, it may go to in situ carcinoma, and that's usually associated with HPV. Here's a cervical polyp. If you look, you can see it's fairly broad and round, and that it narrows down, and it's on what we call a stalk and it attaches -- stalk attaches inside the canal of the cervix, the endocervical canal.

All right. CIN, cervical intraepithelial neoplasia. All right. What this refers to is carcinoma in situ or severe dysplasia. Full thickness abnormalities, basically is the concern.

Now, I told you that cervical -- it can be graded at mild, moderate to severe, and another way to grade them is CIN, cervical intraepithelial neoplasia, grade I, II and III. Grade I is mild dysplasia, II is moderate and III is severe. Okay?

So let's see. So there's many different strains of HPV. Okay? But the ones that are the most -- that causes the overwhelming warts and cervical cancer are going to be 6, 11, 16 and 18. All right? So that's why they develop the vaccine against the four strains. And it can be a Pap smear is an office procedure where they take a cotton tip applicator, they rub it on the cervix. The idea with the cotton tip applicator is to pick up desquamated shed cells. The shed cells then the either be rubbed on a glass slide, sprayed with a fixative so they dry flat, or they can be -- the cotton tip applicator is put into a small vial with liquid in it, sent to the lab, and then they analyze the cells in the lab. So either in the liquid or on the glass slide, those cells are analyzed by a cytologist and they'll tell you whether they're normal or not, and if they're abnormal, how abnormal are they? Are they severely abnormal or only mildly abnormal.
Okay. So here let's see, here you have basically abnormal cervical tissue. And large dysplastic cell. Notice the nucleus. What makes it dysplastic is the nucleus is very large, okay, as opposed to the other cells that appear more flattened, the cytoplasm is more pale, and the nucleus is what we call pyknotic, much, much smaller.

All right. So cervical dysplasia and carcinoma. Typically occurs at the junction of the squamous cells which cover the outer portion of the cervix, and the columnar junction which lines the endocervical canal. Okay?

And the Pap smear will reveal abnormal cells. When you have an abnormal Pap, the recommendation is colposcopy. They look at the cervix with a microscope. It magnifies the cervix. They put a weak vinegar solution, weak acidic acid solution on the cervix with a cotton applicator, and what that does is it brings up the glycogen in the cells, and if there is -- it will show abnormal areas, because the acetic acid solution causes a pattern, a staining pattern, and the staining patterns are graded, okay, as far as abnormality, and we do colposcopy, you biopsy the worst-appearing area, okay, not the best, but the worst, because the feeling is you want to know the most aggressive area, maybe the most aggressive area on colposcopy comes back from the pathologist as saying it's just mild dysplasia or moderate dysplasia. What you don't want to do is you don't want to miss a carcinoma in situ so you really want to look for the most aggressive areas. And of course as I mentioned before, biopsies establish the diagnosis. So treatment's going to depend on the extent of the disease. In situ carcinoma, all right, full thickness abnormality of the stratified squamous, beyond the base membrane, patients can have that for years. Typically with carcinoma in situ, the best treatment is to remove it surgically, either by laser or knife. Cryocautery freezing now is recommended only for mild to moderate dysplasia, and hysterectomy is very aggressive, but some woman in her 40s, if she's done having children and she's already had a tubal ligation, she may want to have her uterus removed so she doesn't have to worry about Pap smears and thinking that her cervix may develop cancer. So you have to tailor make this to the individual patient.

Invasive carcinoma is treated with radiation and aggressive hysterectomy called radical hysterectomy where they remove the uterus, the tubes, the ovaries and surrounding tissues. They're long procedures, they take four or five hours sometimes, and because the anatomy, female anatomy, you have to be concerned about the ureters. Ureters go right in through the uterine artery. The cervix, which has the cancer, very easily can extend into the bladder or the rectum, so this surgery is really very complicated. They
need radiation, sometimes before, sometimes afterwards. It's a difficult cancer to treat.

All right. Endometrial disorders, the lining of the uterus. All right. We have overgrowth of the uterus, endometrial hyperplasia, and what that refers to, usually endometrial hyperplasia occurs from persistent estrogen stimulation, typically for women in the perimenopause time. I told you menopause is one year without a period. Leading up to the menopause, women can have menstrual bleeding without ovulation. They have estrogen levels for a while, and then the estrogen levels fall. They have bleeding. And then it goes back. Estrogen levels come back, so it can cause endometrial hyperplasia because the estrogen that's present doesn't have the counterproductive effect of progesterone.

All right. Also it can cause endometrial polyps, which can cause some bleeding. The concern is, with post menopausal bleeding or perimenopausal bleeding is that with persistent estrogen stimulation, it may stimulate the endometrium to grow into a cancer so you have an endometrial adenocarcinoma. And it presents with irregular uterine bleeding or post menopausal bleeding, and the way you treat that is you try to do an office biopsy, endometrial biopsy. Small little canula is inserted through the cervix, attached to a syringe. Backdraw on the syringe, get a little bit of tissue, send it to the lab and it should be able to tell you whether there is a cancer there or not. The other procedure is a D & C. D & C is where it's done in an operating room, in and out surgery, dilate the cervix, put a curette in and scrape the lining of the uterus clean and send it to the lab for analysis. Okay?

And here you have an area benign endometrial hyperplasia. The uterus has been bisected. The irregular area is on the top of the uterus and then it also shows you a polyp in the uterine cavity.

All right. Also, the uterus, women can get fibroid uteruses, fibroid tumors. These tumors sometimes can grow gigantic size. They can be the size of a basketball. Okay? I've seen them that size. They're huge. The uterus on the left is irregular in shape due to several fibroids. The picture in the center is an interesting tumor because it fills the inside of the endometrial cavity. It will cause bleeding, irregularities, because it's on the inside of the cavity and it cause infertility. And then what they did in the picture on the right, they cut the fibroid in half, so you see the whirly nature of the smooth muscle fibers that the uterine myomas are made up of.

All right. Irregular bleeding, DUB, refers to bleeding that is not the normal estrogen-progesterone type of bleeding. Okay? And so there's several reasons for this. The follicle may not mature and as a result it doesn't ovulate.
If it doesn't ovulate, it doesn't release the egg, progesterone doesn't form. So as a result you have unopposed estrogen. So you can have a disturbance of the normal cyclic interaction estrogen and progesterone. The bleeding may occur at the correct time in the cycle, but it may be irregular, it may be light. It could be heavy. It could be prolonged. All right? And as a result when it's exposed to continuous estrogen, you have irregular bleeding. The treatment typically is for DUB, is you give them five to ten days of progesterone. You give them basically scraped it for five days, give them ten milligrams twice a day for five days, and the progesterone builds the lining up, gets it prepared for a period, and then estrogen levels fall, and they have menstruation, and then after that, hopefully they resume a normal cycle. If they don't, you can put them on the pill.

Other causes of bleeding besides DUB are going to be endometrial hyperplasia, polyps of the cervix or uterus, fibroids and uterine carcinoma.

All right. So let's see now, this is a summary of what I talked about before, the normal menstrual cycle.

All right. First half, the glands and stroma proliferate under the influence of estrogen. Mid cycle ovulation occurs and then the corpus luteum produces the estrogen and progesterone. Progesterone causes the endometrium to undergo changes, causes it to mature and receive the fertilized egg. We call this the secretory phase. If no pregnancy occurs, the corpus luteum shrinks, involutes, estrogen and progesterone fall and the endometrium is shed and then your cycle begins.

Dysmenorrhea refers to the term for painful periods. Typically most of the time, it's primary or essential in that there's really no reason why women have pain with their periods. You can do all the tests. Secondary dysmenorrhea would be endometriosis. Women have painful periods because they have endometriosis.

And prostaglandins have high concentrations in the endometrium, so that when women menstruate, prostaglandins are released, causing cramp and pain. Treatment for prostaglandin, what medications over the counter do women take for menstrual cramps, Advil, Nuprin, Ponstel, Anaprox. All these medicines inhibit the synthesis of prostaglandins, so it lowers the prostaglandins within the muscle.

All right. Let's see. All right. Ovarian cysts and I think we're just about done, guys. All right. The ovaries can form cysts, they arrive from ovarian follicles from the corpus luteum. You have functional cysts that produce hormones, okay? They can regress, they don't become large. You can have endometrial cysts, which are deposits of endometrium, which gradually and slowly bleed into
themselves, and they're sometimes called chocolate cysts because they have old blood in them, and the blood becomes very thick and brown.

Here's a by valve of a normal ovary, and of course on the left-hand side around 10:00 is the corpus luteum. Okay? You see that yellow appearance. With a normal follicle, about 1:00.

All right. The cystic teratoma or dermoid is considered a benign cyst on the ovary and it can have in it elements of epithelium. Can have skin, hair, teeth, bone, GI tract, thyroid, I've taken out in my practice, I've taken a lot of dermoids that are benign cystic teratomas, and the path reports, you know, not all on one patient, but I've had path reports, you know, diagnosing all these elements in the cyst, confirming it. Occasionally these teratomas can be rare. That's very -- I mean, can be malignant, but it's very rare.

Here's an example of a dermoid or benign cystic teratoma. You see the hair that extends from there, and typically the secretions within the dermoid are going to be a yellow, thick type of secretion because of the epithelial nature of the glands that are present. I've had more than one patient who was diagnosed by radiologist with a teratoma because they had some abdominal complaints, and the surgeon or doctor ordered an x-ray of the abdomen, and on the abdomen, it showed a fragment of bone in the area of the ovary, and I had one patient it showed a tooth in the ovary. All right. Within the dermoid cyst.

And the findings of the dermoid cysts were an incidental finding. That was not what was causing them to see the doctor.

All right. So let's see, ovarian tumors. All right. The epithelial tumors of the ovaries, okay, are divided into two types, serous and mucinous. The serous tumor resembles the cells lining the fallopian tube. The mucinous tumors resemble mucus-secreting tumors of the endocervix. The benign tumors called a mucinous cystadenoma or serous cystadenoma. The malignant one is going to be the mucinous cyst adenocarcinoma, or the serous cyst adenocarcinoma, and the concern is that with the serous, but also with the mucinous, fragments can break off in the peritoneal cavity and then they can be transported to other areas, the liver, the omentum, stomach, areas of the stomach, basically on the outer surface of the stomach, or the intestine, but still metastasizing out of the pelvis. Ovarian tumors metastasize out of the pelvis, it increases the level of aggressiveness. They're at a different stage. It involves a staging. The staging is not as favorable.

Endometrioid tumors are tumors of the endometrium usually
located outside the uterus on the ovary. Fibromas are benign fibrous tissues on the ovary. Granulosa-theca cell tumors are interesting because they produce hormones. The granulosa cells are cells that surround the egg. They line the follicle, and they produce estrogen. All right?

So if you have a granulosa-theca tumor, sometimes women present with irregular bleeding from the endometrium because the granulosa cell tumor produced estrogen every day, stimulating the lining to grow and subsequently ends up with bleeding. Also, you can have masculinizing tumors that produce testosterone. Here's an example of a benign cystic ovarian tumor. You can see by the size of the hands, okay, that are present how large that tumor is. It's bigger than a basketball.

All right. Diseases of the vulva. Basically the vulva is the external genitalia. The term leukoplakia refers to white patches or lesions on the skin. Sometimes they are considered pre cancerous. Okay?

And let's see, carcinoma of the vulva can be northbound pre-and post menopausal women and is treated by basically if it's advanced, it's treated by removing of the vulva. And also, the nodes, it spreads to the nodes in the groin and they have to be removed.

Toxic shock. Everybody knows, I'm sure, all of you have heard of toxic shock. I've never seen a case of toxic shock, and I have five partners. We are a busy practice. But basically it's always included and it's caused pretty much by Staph aureus, all right, it lays in the vagina and it's associated with periods, and usually with the super absorbent tampons. In theory what happens is women with heavy menses use these super absorbent tampons and they have a desiccant in them, which makes them super absorbant, and sometimes if they're left in too long, they have a high content of blood that favors growth of the Staph aureus. If they're not changed frequently, or the desiccant can press up against the vaginal wall and cause a very superficial ulcer. All right? Breaks in the epithelium allows the staph in the vagina to gain access into the patient's bloodstream, causing toxic shock.

So basically, the tampons can cause superficial erosions, as I mentioned, because they've got the desiccant. So women with toxic shock can present with a fever, vomiting, diarrhea, muscle aches and pains. They can have problems with their blood pressure. They get a sunburn-like rash.

Basically, give them supportive treatment. It usually gets better. We -- you can give them antibiotics to eradicate staphylococci, but it doesn't shorten the course. We used to tell our patients that you should use the super absorbent tampons usually on heavy menstrual days. Don't use them the
whole cycle, just when you absolutely need them, and be sure to change them very frequently.

All right. Let's see. Methods of birth control. Natural family planning refers to timing of intercourse to avoid, so you don't have intercourse at the time of ovulation. When I first started practice, we practiced at a Catholic hospital, and the nuns, okay, due to the church's stand on birth control, had a natural family planning clinic, and they would run the clinic and they would talk to the wife and the husband, or the partners about how to diagnose when ovulation would occur, by taking their temperature, cervical mucus, positioning of the cervix in the vagina, and every month, we saw patients from the family -- natural family planning clinic who were pregnant. So it really is not a good form of birth control.

Much better is the pill. All right? The pill, because it reduces -- it has the most -- it's the most accurate, okay, highest success rate in preventing pregnancy. The other barrier methods are going to be condoms, you guys know about, and diaphragms. Diaphragms are inserted up against -- in the vagina. They cover the cervix. There's a contraceptive cream that's inserted inside the diaphragm and it should be kept in place six to eight hours after use. The way the diaphragm works is by putting this plastic cap over the cervix, it prevents the sperm from getting to the cervical canal and causing fertilization. All right? The IUD is inserted with the period. The way the IUD works, it's a foreign body, sits inside the uterus and creates a foreign body reaction in the endometrium, the lining of the uterus. As a result, that foreign body reaction makes the endometrial -- endometrium unfavorable for conception. So the risk is that because it's a foreign body, you increase the risk of getting a tubal infection, or a tubal pregnancy. Very rare, but it is a possibility, and it does create -- usually it makes periods heavier.

All right. So emergency contraception, sperm can survive as long as six days in the genital tract. All right. So intercourse several days before ovulation can lead to pregnancy. There are morning-after pills, okay, to prevent pregnancy, and the sooner you take it, the better -- the greater the success rate. In the Web search, there are some questions about the morning-after pill, which you guys can read, and answer. Okay? All right. Any questions? No? Okay. We're done for today.