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## Breast Reconstruction Surgery

**Guest Expert:**

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Reconstruction Program*

**Yale Cancer Center Answers**

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*Welcome to Yale Cancer Center Answers with doctors Francine Foss and Lynn Wilson. Dr. Foss is a Professor of Medical Oncology and Dermatology, specializing in the treatment of lymphomas. Dr. Wilson is a Professor of Therapeutic Radiology and an expert in the use of radiation to treat lung cancers and cutaneous lymphomas. If you would like to join the conversation, you can contact the doctors directly. The address is [canceranswers@yale.edu](mailto:canceranswers@yale.edu) and the phone number is 1888-234-4YCC. This week, Dr. Foss welcomes Dr. Alexandra Au. Dr. Au is Assistant Professor of Plastic Surgery and Co-Director of the Yale Breast Reconstruction Program. Here is Francine Foss.*

- Foss Can you start us off by telling us a little bit about how long you have been here at Smilow Cancer Hospital and where you came from prior to this?
- Au Sure, I have been back here at Yale since September 2011, so it has only been three or four months now. Originally I am from Philadelphia and I did my undergraduate training there, and I ultimately wound up at the University of Rochester in Rochester, New York for medical school, and it was in medical school that I got interested in plastic surgery and specifically breast reconstruction. I met one of my mentors, Dr. Serletti there who is a nationally acclaimed reconstructive microsurgeon, and from that point on I pursued a career in plastic surgery. I was lucky enough to match here at Yale for my plastic surgery residency, so I spent six years here, and then following the completion of my residency, I went to the University of Pennsylvania for a year of fellowship in my training in reconstructive microsurgery, and then after my fellowship, I wound up back here at Yale and the Smilow Cancer Hospital.
- Foss Is the breast reconstructive program a new program here at Yale?
- Au No, there has always been a breast reconstruction program. It is just with the ongoing development of the breast center at Smilow there has been a renewed push to expand the breast reconstruction program and make it one of the top programs in the nation.
- Foss You also perform other plastic surgery procedures, are you restricting yourself only to breast reconstruction at this point?
- Au No, I perform all aspects of plastic surgery. As part of the training to become a plastic surgeon in residency, we were trained in hand surgery, craniofacial cosmetic, body contouring as well as microsurgery and breast reconstruction and really all those areas interest me, however, my main focus is breast reconstruction.
- Foss A lot of people in the audience probably only have one opinion about plastic surgeons and that is

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the cosmetic part of it, could you talk a little bit about the reconstructive part of plastic surgery and what is involved with that and how much training you need to be able to be good in that area?

Au Sure, again, in terms of reconstruction, I think reconstructive surgery is kind of the heart and soul of plastic surgery. It is how our specialty was initially developed and it has been the growth of the plastic surgery that has expanded into cosmetic surgery, which is quite often what people associate with the field. I think that it is really the advancement in the new techniques and the understanding of anatomy that has been developed through reconstruction that allows us to be masters and experts in the field of cosmetic surgery as well.

Foss Reconstruction involves not only moving skin, but there also are blood vessels and muscles and multiple other things involved as well?

Au Yeah, it depends again on the type of reconstruction. Besides breast reconstruction, we also do head and neck reconstruction and reconstruction of large wounds, lower extremity, really plastics surgeons operate head to toe on all age groups, and it involves, like you said, not only the skin but the blood vessels and muscles, really every part of the human body can be affected by a plastic surgeon or be used by a plastic surgeon in the reconstructive process.

Foss Can we focus a little bit now on the whole issue of breast reconstruction? Can you tell us a little bit about who is a candidate for breast reconstructive surgery?

Au In terms of evaluating a woman as a candidate for breast reconstruction, it really occurs on an individual basis and really any woman who is having a mastectomy should meet with a plastic surgeon to discuss their options for breast reconstruction. A lot of things play into who is a candidate, namely the patient's other medical problems, their body habitus, factors about their tumor and what other treatments they will need, but really the main message is that any woman who is undergoing a mastectomy should be seen by a plastic surgeon to have that discussion.

Foss A lot of women undergo lumpectomies or partial mastectomies, is there a role for reconstruction in that setting?

Au There can be, there are oncoplastic techniques, where the breast tissue can be rearranged, a woman can have the tumor excised and also be given a bit of a lift or a reduction in the breast size and then they can also possibly have a matching procedure done on the contralateral breast, again possibly a reduction or a lift to match the breast that had the tumor taken out.

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- Foss Alex, I imagine that this is very very important to women who are facing a diagnosis of breast cancer just in terms of the cosmetic issues that they are going to be left with, can you talk a little bit about the importance of reconstruction and when in the whole process of the diagnosis and treatment of breast cancer that is discussed with the patient?
- Au Sure, you mentioned the importance of the cosmetic outcome, and one thing I want to emphasize is that it is really not just a cosmetic issue, breast reconstruction. When a woman has a mastectomy and wakes up after surgery and has a reconstructed breast, or at least has begun the process of breast reconstruction, it is not only a cosmetic issue, it also is an emotional and a physiologic issue, and I think that breast reconstruction really helps a woman feel whole and helps advance the recovery from not only the surgery for breast cancer, but also the diagnosis of breast cancer moving forward with their lives.
- Foss Is it typical then that the woman would meet with the plastic surgeon as part of the initial diagnosis and treatment planning?
- Au It is, and the way that it works in general, and there are obviously multiple pathways, but a lot of times the woman, after having a lesion identified on a mammogram or on self- exam, will have a meeting with one of the breast surgeons in the Smilow Breast Center and the workup will begin from there, and there is a whole team in the breast center, so it involves not only the breast surgeon, the oncologic surgeons, but there are also care coordinators, there are social workers, physical therapists, and once you come into the breast center, you really begin the process with all these different groups, and one of those groups is the plastic surgery reconstructive team. In the decision process after meeting with a breast surgeon, a patient will come and meet with me or one of my partners, Stephanie Kwei also deals with a lot of breast reconstruction patients, and we will meet with the patient, we will go through their history, we will do a physical exam and then we sit down and we have a discussion about the goals of breast reconstruction as well as the different types of breast reconstruction that are possible.
- Foss Could you go through with us a little bit about what those different possibilities are?
- Au In general, I think there are three main types of reconstruction. The first is a tissue expander or implant reconstruction, the second is autologous reconstruction and what that means is you use the patient's own tissue, their own skin, fat, blood vessels, and possibly some muscle from somewhere else from their body, to reconstruct the breast, and then the final way is a combination of using their own tissue and an implant expander and that usually involves using one of the muscles from the back and rotating it around to reconstruct the breast with an implant underneath. A little more detail about those, specifically, what the tissue expander and implant method means is that in most

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cases when the breast surgeons perform the mastectomy, I would be present in the operating room at the same time and what I do is put a tissue expander underneath the muscle of the chest on the side where the breast has been removed. This tissue expander is similar in very basic terms to a water balloon, except it is filled with salt water and it is not fully expanded when I first put it in. We wind up closing all the incisions and eventually over the next several weeks, we inflate that expander and it stretches the breast skin out and gives a good pocket where we can then go back in for a second procedure and put in a permanent implant. So that is the tissue expander and implant reconstruction in a nutshell. In terms of autologous reconstruction, again, that is using the patient's own skin from somewhere else on their body and the primary spot that has been the main donor site for that tissue has been the abdomen, the lower abdomen. There are different types of flaps. There is what we call a free TRAM flap and TRAM means transverse rectus abdominis myocutaneous flap. There is a free muscle sparing TRAM flap, where some of the muscle from the belly is taken, but not the whole segment, and then there is a DIEP flap also known as a deep inferior epigastric artery perforator flap. In that case, there was no muscle taken from the abdomen so it is similar in a way to a tummy tuck where I take the skin and the fat from the lower part of the belly. The way that it differs from a tummy tuck is when I move that skin and the fat to the breast to reconstruct it, for the tissue to survive, it needs to have blood going into it and coming out of it, so I need to take an artery and a vein, and again sometimes a piece of muscle depending on the person's each individual patient's anatomy. So the surgery goes a bit deeper into the abdomen than a tummy tuck, which is a little more superficial. I then transfer that tissue to the chest and I sew the blood vessels to blood vessels either in the chest or in the axilla or the armpit and then I use the skin and the fat and mold that to reconstruct the breast. Obviously, that surgery involves another site on the patient's body so they do wind up with the scar that goes hip-to-hip across the abdomen and a little circular scar around the belly button, and that autologous tissue reconstruction in a nutshell. The final method is using some of the muscle from the back with the tissue expander and generally that is a second line option, because it does combine some of the risks of both tissue expander and implant reconstruction as well as some of the risks and down sides of using the patient's own tissue.

Foss It sounds like those are somewhat complicated procedures and highly different one to the other. How do you actually make a decision for the individual woman and how do you discuss those in terms of risks and benefits and which would be best for that woman?

Au There is no right or wrong answer in general. There are some factors that would steer women towards one type of reconstruction over another and my goal is to provide the woman with only information and to facilitate their decision and how they would like their breast reconstructed. In terms of risks for the tissue expander and implants, the major risks are that it is a foreign body, it is not your own tissue, so there is the risk of it becoming contaminated with bacteria and developing

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an infection. There is always the risk of scar tissue that builds up around the tissue expander implant, and if that scar tissue is thick, it can change the shape of the implant and also make it uncomfortable, in which case, we may need to go in and revise the reconstruction. Then in implants, there is always the risk of rupture. Approximately 1% per year rupture, so specifically those are the risks with implants. The risk with using their own tissue is there is always the risk of problems with the blood flow that I have sewn the blood vessels together, and if that occurs, we would need to attempt to correct it, and if we cannot, there is always the possibility that that tissue would need to be removed and we would have to discuss other options for breast reconstruction.

Foss We need to take a brief break right now for a medical minute. Please stay tuned to hear more about breast reconstruction surgery with Dr. Alex Au.

*Medical  
Minute*

*The American Cancer Society estimates that over a 1000 patients will be diagnosed with melanoma in Connecticut each year. While melanoma accounts for only about 4% of skin cancer cases, it causes the most skin cancer deaths. Early detection is the key. When detected early, melanoma is easily treated and highly curable and new treatment options and surgical techniques are giving melanoma survivors more help than they have ever had before. Clinical trials are currently underway at Yale Cancer Center, Connecticut's federally designated Comprehensive Cancer Center, to test innovative new treatments for melanoma. The Specialized Programs of Research Excellence and Skin Cancer Grant at Yale, also known as the SPORE grant, will help establish national guidelines on modifying behavior and on prevention as well as identification of new drug targets. This has been a medical minute brought to you as a public service by Yale Cancer Center. More information is available at [yalecancercenter.org](http://yalecancercenter.org). You are listening to the WNPR Health Forum on the Connecticut Public Broadcasting Network.*

Foss Welcome back to Yale Cancer Center Answers. This is Dr. Francine Foss and I am joined today by my guest Dr. Alexander Au and we are discussing the issue of breast reconstructive surgery. Alex, prior to the break you told us in detail about the different options for women undergoing reconstructive surgery and you mentioned that you unusually meet with these women prior to any definitive treatment for their breast cancer. Could you just let us know again at what point the reconstruction is actually done, and in fact, if it is not done immediately, could it be done later on?

Au For the majority of women, we have been performing immediate breast reconstruction and what that means is that at the same time the breast is removed during the mastectomy, we perform the reconstruction, or at least begin the reconstruction. There are some factors which could lead to performing delayed reconstruction and what that means is the patient would have mastectomy and

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we would perform the reconstruction at a later point in time. Some of those factors are patient preference. There are women that choose to have a mastectomy and then want to see how affected they are by the absence of the breast and then decide if they would like to pursue breast reconstruction. There is also a group of patients, specifically women that have been identified as needing radiation therapy, and they know this before they undergo mastectomy, and in those patients generally we perform the reconstruction after they have had completed their course of radiation therapy. So, we can perform it immediate or delayed, but again there are some factors that push us one way or another.

Foss So, if the woman say undergoes radiation therapy and does not want an implant or reconstruction right away, is there a window of time or could you say even come back a year later?

Au She can come back even a year later. Generally, we have to wait several months after radiation has been completed before we would undergo any procedure for reconstruction, and in the case of women that have had radiation, generally, tissue expander and implant reconstruction is not the ideal method. The reason is, radiation increases the risks of infection and of capsular contraction, which is the scar tissue around the expander. So, generally for patients that have had radiation, we recommend autologous reconstruction using their own tissue.

Foss Is there a disadvantage say for a woman not getting radiation to wait? Or do you strongly recommend that they consider it immediately?

Au If a woman knows she does not need radiation, generally, in my personal experience, immediate reconstruction has the benefit of again allowing the patient to feel whole postoperatively and after their discharge from the hospital, and speeds the recovery both physically, mentally, and emotionally.

Foss With respect to that, does it prolong a hospitalization for a woman to undergo a reconstruction immediately?

Au It does, depending on the type of reconstruction. So for women that have had an expander and implant reconstruction, and again this depends on whether it has been unilateral or bilateral, they generally stay in the hospital for one to two days. For women that have had reconstruction using their own tissue, mainly a free flap transferring tissue from their abdomen or somewhere else on their body, there is always the risk of having problems with the blood flow, which I mentioned earlier. The highest risk time for problems with the blood flow is generally the first two days, but

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it still is possible up to four days after, and so they stay in the hospital in general four days postoperatively. So using your own tissue does lead to staying in the hospital a bit longer.

Foss In terms of your experience working with many women in this setting, does there seem to be a preference for women? Is it swinging in one direction or another versus implants and the reconstruction?

Au In my experience, nationwide, the most common form of breast reconstruction is tissue expander and implant. Because I have done a specific year of training in microsurgery, I feel I tend to see more women that are seeking the reconstructive options of using their own tissue. I think that is the same at all higher volumes centers and academic centers across the US that patients seek those centers because they know they have the option of using their own tissue.

Foss Do you recommend, even if a woman thinks that she might want to go the implant route that women at least hear about the other procedure or get information about the other procedure?

Au Of course, I think information is the key to making any decision about your own health and especially with breast reconstruction. It is important to know what all the options are and then weigh those options, the risks and the benefits, and see how that matches your own lifestyle and your own goals.

Foss Alex, can you talk about the downside of reconstruction? How often does it not work and then what do you do at that point?

Au So the risk of it not working specifically when using your own tissue, that number varies depending on what studies you look at, but in general, it ranges from somewhere around 4% to 5% nationwide, although depending on patient factors it may be higher or lower and also depending on technical factors intraoperatively. In situations where the blood flow does not work, where there are problems would the flap, you can return to the operating room and try and fix that. When that is not possible, that tissue needs to be removed because it is not being perfused and then again depending on the patient's factors you talk about other options down the road for breast reconstruction. In some women, it may be possible to perform tissue expander and implant reconstruction. In others, they may require either a different free flap using tissue from somewhere else on their body or using the muscle from the back rotated around, plus or minus tissue expander and implant.

Foss And that is the DIEP flap surgery that you alluded to at the beginning of the show?

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Au Yes, the DIEP, or another variant is the muscle sparing TRAM flap.

Foss And are those newer procedures?

Au They are, but they have been described for years actually. It began using a pedicled TRAM for breast reconstruction and what that means is that the skin and the fat of the abdomen stays attached to the muscle, the rectus abdominis, and the six pack muscle from the belly. It is divided inferiorly more towards the feet and then it is rotated underneath the skin of the abdomen up to the breast. The next development was that instead of taking the whole muscle and leaving the blood flow attached, you took a segment of the muscle and totally separated it from the body and then transferred it to the chest and sewed the blood vessels back together, that is what is called free TRAM flap. Further developments, basically trying to minimize the negative effects on the abdomen from taking muscle, led to taking less and less muscle instead of taking the whole width of it, you only take a segment that is approximately the size of a postage stamp or a few centimeters wide, that is called the muscle sparing TRAM flap and then again in an effort to minimize the amount of muscle and minimize the effect that it has on the abdomen, the DIEP flap was developed and what that does is you essentially split the muscle and you are able to take the blood vessels out without having to take any muscle and again the overall goal is to minimize the impact on the patient's abdomen.

Foss As we think about these women, how they are recovering from mastectomy and they are also recovering from this surgery and we know that some women post-mastectomy, if they have lymph node dissection, can have difficulties with the arm swelling and other complications. Can you talk about, from patient's point of view, symptomatically, how does a woman feel after one of these flap surgeries? Is there additional pain? Is there additional swelling in the arm? Are there other issues that they need to deal with?

Au There are other issues. Because we are operating on a different part of the body, that is an additional site that is going to be uncomfortable. We do put special pain pumps in place at the time we take the tissue from the belly to make a woman as comfortable as possible but over the several weeks after surgery, they do need to minimize the amount of weight that they lift and they need to avoid repetitive activities because their abdomen still will be sour and we want to prevent any risk of hernia formation. In terms of arm swelling, the portion of our surgery does not really affect arm swelling. Actually, in some situations, it has been described where surgeons actually transfer some of the lymph nodes from the groin attached to the flap from the belly in an attempt to reduce arm swelling, but overall our surgery does not make the arm swelling necessarily worse.

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- Foss And as far as the abdominal muscle function that remains intact, say if a woman is an athlete, they do not have to worry about this moving of muscles?
- Au The overall goal is to have a woman functioning at the level postoperatively that she was at preoperatively. Studies, specifically at the University of Pennsylvania, have shown that if you do advanced physiologic testing, you do notice some weakness in the abdominal muscles, differences basically between the DIEP and muscle sparing TRAM flap, but that in general patients do not notice that, it is just on the advanced testing that you can find these differences.
- Foss With respect to other issues that women might have concerns about, one of those issues may be sensitivity of the breast after and if there is nipple sparing whether they are sensitivity in the nipple after these kinds of procedures, could you comment a little bit about that?
- Au In general, the nerve supplied to the skin over the breast is coming from the deeper tissue. So, at the time of mastectomy, when the breast tissue is removed some of the sensory nerves going to the skin are cut, and I told my patients that they can usually expect to have some numbness of the breast skin postoperatively. To some degree that may improve over time, but it may not and in a fair number of women, there are areas of numbness that persist long after surgery. The type of reconstruction whether it is tissue expander in implant or using their own tissue does not really affect the numbness one way or the other.
- Foss But, it is an issue obviously that women will ask about and with respect to the type of chemotherapy and hormonal therapy that women receive after their surgery, there is no specific impact of that on what type of procedure they have?
- Au For the most part no, the one issue with chemotherapy is when the woman has a tissue expander in place, if they received chemotherapy and their blood counts are low, we may defer performing a fill of the tissue expander or putting some fluid into it to stretch the skin out until their counts have risen a bit, but otherwise chemotherapy itself does not affect the choice for what type of reconstruction.
- Foss Alex we have read a lot about silicone implants and the problems in the past with those. Can you reassure our listener about the current implant that we are using, and is there a risk with those implants of developing other problems?
- Au Sure, so years ago there was a concern that silicone implants could be associated with autoimmune disorders, pain syndromes, any number of problems, so the FDA pulled them off of the market and over the last several plus years the FDA did the research and found that there was no

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associated links. So now, silicone implants have been re-released for use. A current issue is the risk of type of lymphoma associated with implants, which is currently being studied. The current evidence shows at least the FDA at this point acknowledges the risk of the lymphoma but feels that the risk of it is so low that it does not represent a huge risk of over the millions of women that have implants in place, I think there are 50 to 60 cases of this lymphoma described and most are curable, but it is an issue that I tell women about and trying to make part of their decision process.

*Dr. Alexander Au is assistant professor of plastic surgery and co-director of the Yale Breast Reconstruction Program. If you have questions or would like add your comments, visit [yalecancercenter.org](http://yalecancercenter.org), where you can also get the podcast and find written transcripts of past programs. You are listening to the WNPR Health Forum on the Connecticut Public Broadcasting Network.*