

# Your Options

A Guide to Reconstruction for Breast Cancer



# Options

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“I’m a wife and mother and I still have a beautiful future that awaits me.”

## A Personal Choice

Reconstruction after breast cancer is a decision that will have a profound effect on not only your body, but your emotional well being. This decision should reflect your health, your priorities and your lifestyle.

Breast reconstruction is a personal journey that takes into account many individual factors. While not every woman chooses to have reconstructive surgery after breast cancer surgery, having the greatest number of choices can offer you significant psychological and practical benefits.

This guide was developed to help you and your family review the surgical choices for breast reconstruction. In consultation with the U-M healthcare team, this will help with making a decision that’s best for you.

The treatment of breast cancer is a journey. At U-M, our highly skilled breast cancer plastic surgeons believe that giving you the knowledge of reconstruction options can make for a smoother course.

### Linda’s Journey at University of Michigan

The scars are a constant reminder that I’m a survivor, and that’s OK. I call it my “new normal.”

I’m a wife and mother. Life seemed to be rolling along fine when I was suddenly stopped in my tracks. I was shocked to learn I had breast cancer and even more devastated to hear my doctor say that word – mastectomy. To think that this was going to be my journey, was, well, really frightening. I went through the typical phases. I was angry. I was scared. Frankly, I felt like I had been hit upside the head.

The reality was I needed to listen to the experts and take action. After all, I am a wife and mother and I still have a beautiful future that awaits me. A team of plastic surgeons at U-M explained my options. There were so many and they all

could be done right in Ann Arbor and at the time of surgery. For my doctors, it wasn’t a clinical decision; they were helping me choose what was right for me. Our decision was the DIEP Flap. The fact that they could use my own tissue for the reconstruction was intriguing and reassuring to me.

One of the hallmarks of getting me to a new normal was running. Running has been kind of a metaphor for me. Like cancer, running can be tough and I sometimes feel like I want to quit, give up, just be done, but I know I need to just keep going.

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*Watch Linda’s story at:*  
[www.UofMHealth.org/YourOptions](http://www.UofMHealth.org/YourOptions)





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## Helping You Make a Decision

The goal at Michigan Medicine is to use our care and expertise to make sure that every woman who undergoes breast reconstruction surgery is given an unprecedented level of personal care. We tailor what we do to meet your goals for your appearance and sense of self. After a mastectomy, we make sure we have done everything we can to help you regain a sense of normalcy.

The decisions about having breast reconstruction will not be easy to make, but there are answers for your questions. Your surgical team will work right along side you to help you find the surgical path that best fits you and your lifestyle.

Whether you choose to have breast reconstruction at the time of your surgery or sometime later, your doctors will lay out your options. If you need radiation, your doctors will help advise you on when it is safe to have reconstruction surgery. Some other specific health problems are also carefully considered during your consultation.

While plastic surgeons at the University of Michigan are highly skilled in breast reconstruction, you should understand that a reconstructed breast will not look and feel like your natural breast; however, every effort is made to give you the most natural look and feel possible. Ask your doctor to see before and after photos of women who have had breast reconstruction so that your expectations are in line with possible results.

Talk to your medical team about your options. Consider your lifestyle, your size and shape. This isn't a decision that should be rushed. Make sure you are making an informed decision; think about all of your options, then decide on what is best for you.

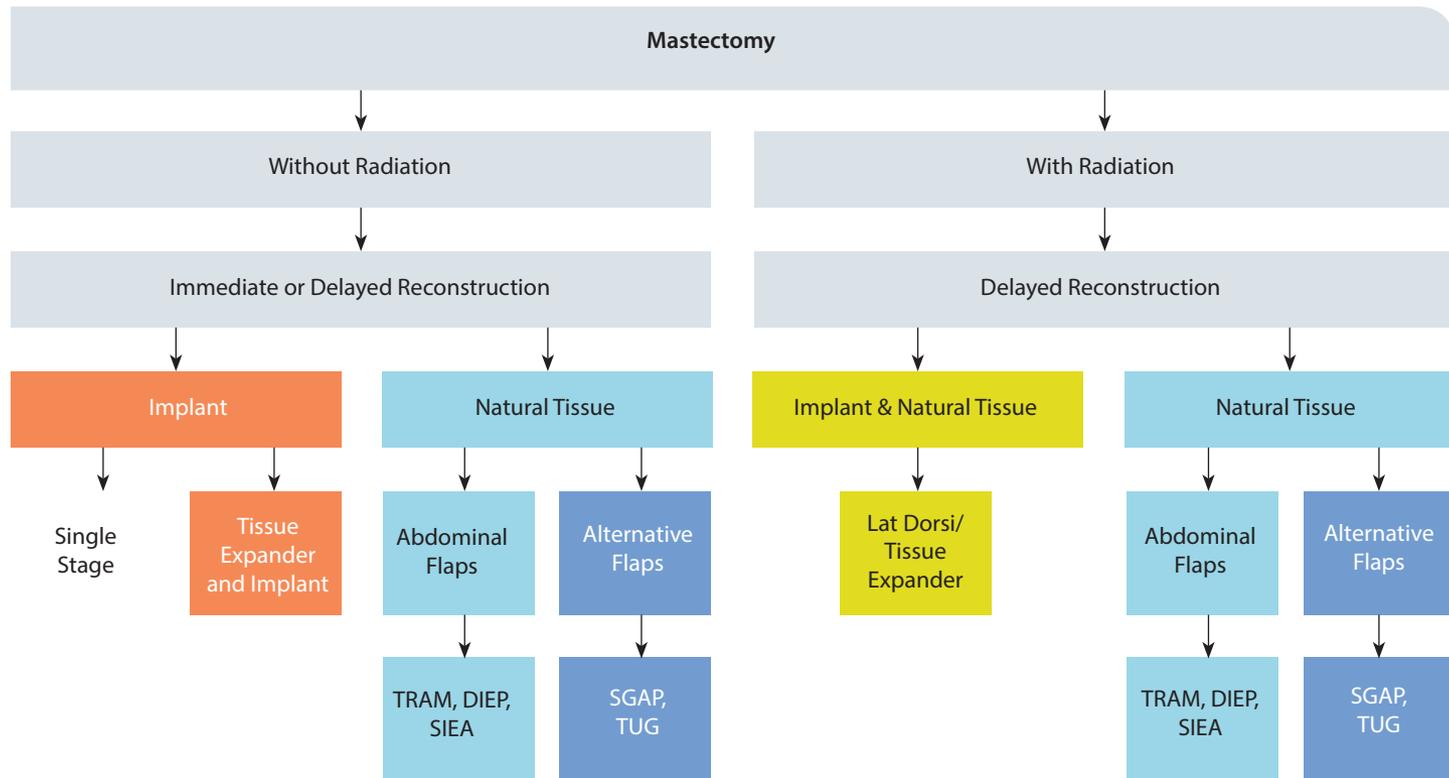
### Implant Reconstruction

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Shorter surgery</li> <li>• Shorter recovery</li> <li>• Shorter hospital stay</li> <li>• Provides more choices on size of breast in smaller patients</li> <li>• Possibility of rupture over time</li> </ul>	<ul style="list-style-type: none"> <li>• Scar formation around the implant over time</li> <li>• Difficulty in matching other breast</li> <li>• Implant infection can result in loss of reconstruction</li> </ul>

### Natural Tissue Reconstruction

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Most natural appearance and feel</li> <li>• Fewer problems in long-term after reconstruction is complete</li> <li>• Adjusts with patient's weight gain and loss</li> <li>• Very effective in radiated patients</li> </ul>	<ul style="list-style-type: none"> <li>• Provides some contouring of abdomen</li> <li>• Potential donor site complications</li> <li>• Longer surgery</li> <li>• Longer hospital stay</li> <li>• Breast size limited by amount of donor site tissue</li> <li>• Scars at donor site</li> </ul>

Your medical team will help you make some of the decisions based on your size, your shape and your lifestyle.



# Our plastic surgeons are nationally known for their experience in breast reconstruction after mastectomy.

## Our Breast Reconstruction Team

Your experience with the University of Michigan Health System comes with knowing that University Hospital is ranked among the top 100 hospitals in the United States. Our Comprehensive Cancer Center and Plastic Surgery Center are nationally recognized for safety, and our doctors and surgeons are some of the best in the country.

With breast reconstruction, our board-certified plastic surgeons and oncologists work as a team, utilizing each other's strengths, as well as the most current and emergent surgical techniques available. The advances in breast reconstruction surgery continue to move forward, and U-M surgeons remain leaders in this progressive movement.

### *Surgical Support*

The surgeons at the University of Michigan are supported by a highly skilled team of nurses and clinical staff who help coordinate your care. This entire team is dedicated to making your experience positive from your first consultation through your last post-operative visit.



### **David Brown, MD**

Dr. Brown specializes in reconstructive and aesthetic surgeries, including breast reconstruction surgery. He has a passion for the education of other plastic surgeons and

has received awards for his teaching.



### **Theodore Kung, MD**

Dr. Kung specializes in microsurgical reconstruction following cancer surgery, aesthetic and reconstruction breast surgery, lymphedema surgery, extremity salvage,

and peripheral nerve injury.



### **Paul Cederna, MD**

Dr. Cederna specializes in reconstructive and cosmetic surgery, including breast reconstruction. He is dedicated to finding new, innovative and minimally invasive approaches to plastic surgery.

He has been recognized by many groups and has received a "Patient's Choice Award."



### **Adeyiza Momoh, MD**

Dr. Momoh is proficient in all forms of breast reconstruction, with a particular interest in microsurgical procedures like DIEP and Muscle-Sparing TRAM Flaps. He also focuses

on augmentation, lifts and other procedures to restore form to breasts after mastectomy



### **Jeffrey Kozlow, MD**

Dr. Kozlow focuses on reconstruction of oncologic and traumatic issues. His training in microsurgery allows him to perform reconstruction procedures like DIEP and

Muscle-Sparing TRAM Flaps.



### **Edwin Wilkins, MD**

Dr. Wilkins performs an array of cosmetic or reconstructive procedures with a focus on breast reconstruction. He is passionate about the long-term outcomes for breast reconstruction

patients and their quality of life, leading national research for breast reconstruction surgeons.

## Breast Reconstruction with Implants

After a mastectomy, some women choose to use implants (a silicone pouch filled with a silicone gel or saline solution). An “expander” is typically inserted at the time of mastectomy and gradually increased in size until the skin has stretched enough to insert the proper sized implant. A second procedure is needed to exchange the expander for an implant. In some women, the expander stage can be bypassed, placing an implant without needing expansion. This is known as “single stage” implant reconstruction. Different women will either need single stage or tissue expansion procedures, and this will be discussed with you during consultation.

### Recovery

Implant surgery is done under a general anesthetic. Bandages will cover the surgery sites and you may be placed in a surgical bra afterward. There will be bruising, soreness and swelling, and you may have drainage tubes to keep fluids from building up.

Some women will be released the same day. Others, especially those who have the breast implants done at the same time as the mastectomy, will spend a night in the hospital.

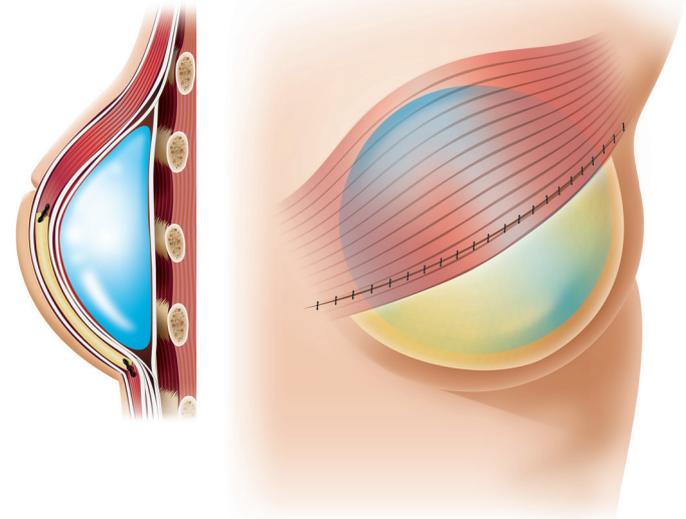
You will be given special instructions about caring for your breasts following surgery and when you can return to work and other normal activities. Antibiotics will help prevent infection.

### To Consider

Radiation results in scarring that may make stretching the skin with an expander difficult. We do not recommend implant reconstruction alone with radiation.

### Benefits

Implant reconstruction can have a profound emotional effect on some women. Many women who have had breast cancer and breast reconstruction with implants say they feel better about their appearance.



### Breast Reconstruction with Implants Timeline



## Natural Tissue Reconstruction at a Glance

### Breast Reconstruction With Implants and Your Tissue

#### Lat Dorsi (Latissimus Dorsi) Flap

- Skin and muscle from upper back is tunneled to breast area
- Maintains original blood supply
- Usually for patients who have radiation and would benefit from implant reconstruction, but need additional skin

### Abdominal Procedures

#### Pedicled TRAM (Transverse Rectus Abdominis Myocutaneous) Flap

- Abdominal skin, muscle and tissue is tunneled to the breast area
- Maintains original blood supply

#### Free TRAM (Transverse Rectus Abdominis Myocutaneous) Flap

- Abdominal skin, muscle and tissue is completely removed from the abdominal area and used to reconstruct the breast
- Blood vessels are used from the central chest to re-establish flow

#### Free Muscle-Sparing TRAM (Transverse Rectus Abdominis Myocutaneous) Flap

- Skin, fat and very little muscle is completely removed from the abdominal area and used to reconstruct the breast
- Blood vessels are used from the central chest to re-establish blood flow

#### Free DIEP (Deep Inferior Epigastric Perforator) Flap

- Skin, fat and no muscle is taken from the abdomen for reconstruction
- Blood vessels are used from the central chest to re-establish blood flow

#### Free SIEA (Superficial Inferior Epigastric Artery) Flap

- Skin, fat and no muscle is taken from the abdomen for reconstruction
- A less common procedure using blood vessels that are closer to the surface
- Blood vessels are used from the central chest to re-establish blood flow

### Alternative Donor Sites

#### SGAP (Superior Gluteal Artery Perforator) Flap

- Uses skin and tissue from the top of the buttocks

#### TUG (Transverse Upper Gracilis) Flap

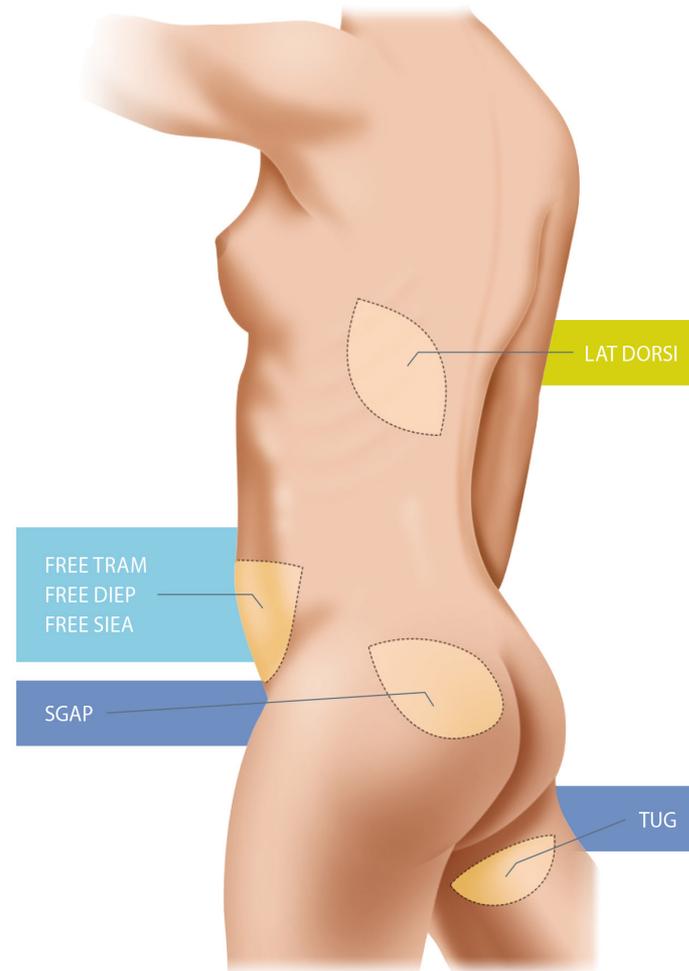
- Uses skin and tissue from the inner upper thigh

## Natural Tissue Reconstruction Locations

Natural Tissue Reconstruction uses your own skin, fat and muscle from another area of your body to reconstruct your breast. It is often a good choice as it provides a more natural looking breast because the tissue used is soft and closely mimics breast tissue. The most commonly used donor tissue is from your lower abdomen. If there is not enough fatty tissue in that area, your surgical team may suggest an alternate donor site, like the thigh, buttocks or upper back. Some flap procedures will require that the artery and veins that provide blood flow to the tissue remain with the donor skin undisturbed or connected during a transfer to the breast. Others require a division of vessels and transfer to the breast by reconnecting to new blood vessels using a technique called microsurgery.

Because taking donor tissue from your own body will leave scarring in that area as well as your breast, you and your doctors will figure out what works best for your body and your lifestyle.

On the next several pages are descriptions of the reconstruction procedures that are available to you. Your doctors may use these descriptions and the accompanying illustrations to help explain each procedure to you.



### Natural Tissue Reconstruction Timeline



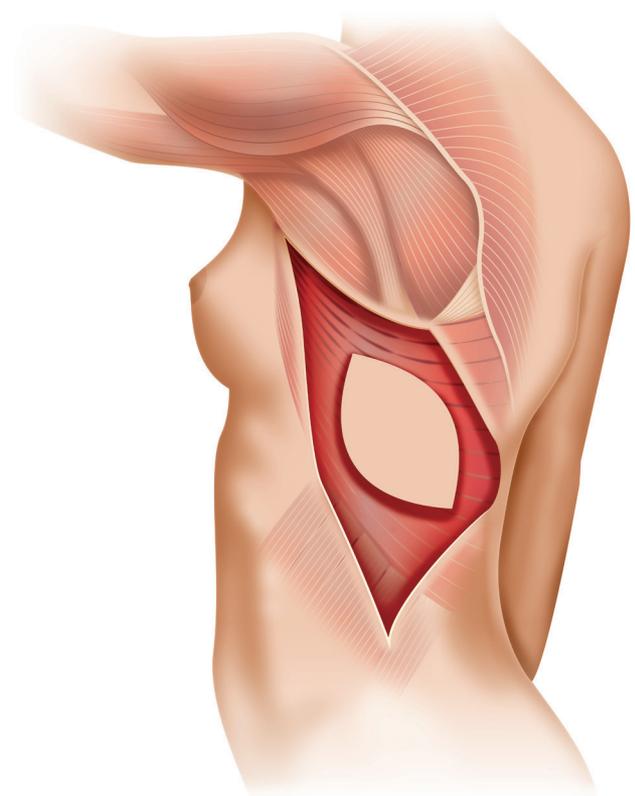
## LAT DORSI (*Latissimus Dorsi*) Flap

This procedure uses skin, fat and muscle from the area next to your shoulder blade for the breast reconstruction. The flap tissue with the arteries and veins attached, are “tunneled” around from the back of the body to the mastectomy site. This procedure is almost always done in conjunction with an implant because the donor site is generally not fatty enough to recreate a breast using the back tissue alone.

By using tissue that remains connected to its original blood supply, you minimize the risk of losing the reconstruction because of blood flow problems.

Some women may notice temporary weakness in the shoulder area after LD Flap surgery as well as a “bulky” area under the armpit from rotating the tissue from the back to the front. This bulky area will most likely flatten out and can be improved over time or with additional revision procedures.

Additional surgery will be necessary to improve on the breast shape and for reconstruction of the nipple, if desired.



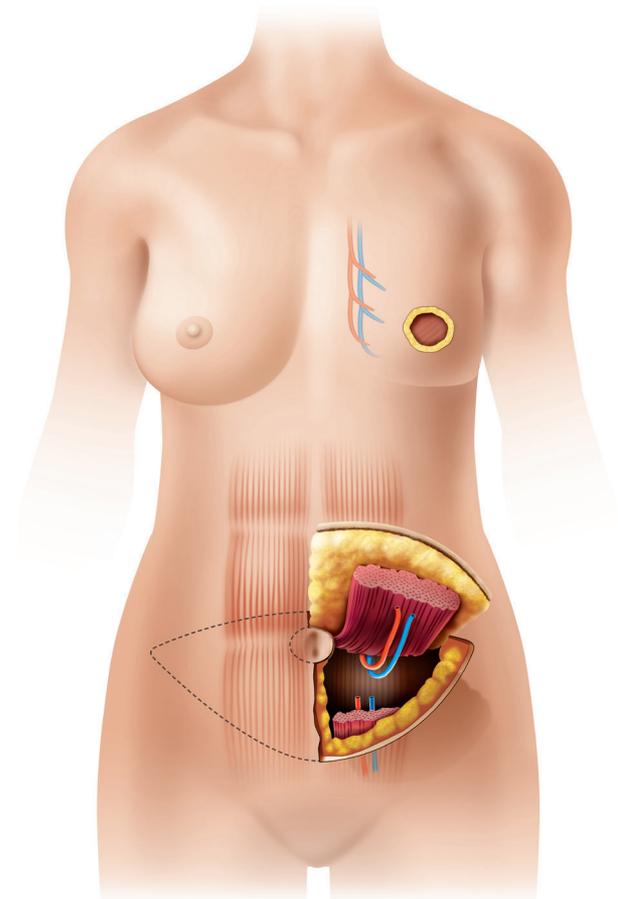
## Pedicled TRAM (*Transverse Rectus Abdominis Mycutaneous*) Flap

This TRAM Flap procedure uses a “tunneling” or “pedicle” method. In this procedure, the skin, fat and muscle of the lower abdomen are separated from their original location, but the blood supply is not disconnected. The “flap” is then tunneled under the abdomen and brought out to the mastectomy site and is sculpted to look as much like the other breast as possible. The lower abdomen is then closed, potentially providing a “tummy tuck” in addition to the breast reconstruction.

This is the most common method of breast reconstruction when you use your own tissue.

The advantage of this procedure is that abdominal tissue is soft and pliable, similar to breast tissue, making it a great replacement tissue. It is a safe and reliable procedure and takes less time than microsurgical procedures. The disadvantage of the Pedicle TRAM Flap procedure is a higher risk of abdominal problems including weakness, hernias and bulges. Sometimes a synthetic mesh is placed inside the abdomen to help strengthen the area.

This procedure often does not require an implant because the abdomen usually provides enough tissue for a breast.



## Free TRAM (*Transverse Rectus Abdominis Myocutaneous*) Flap

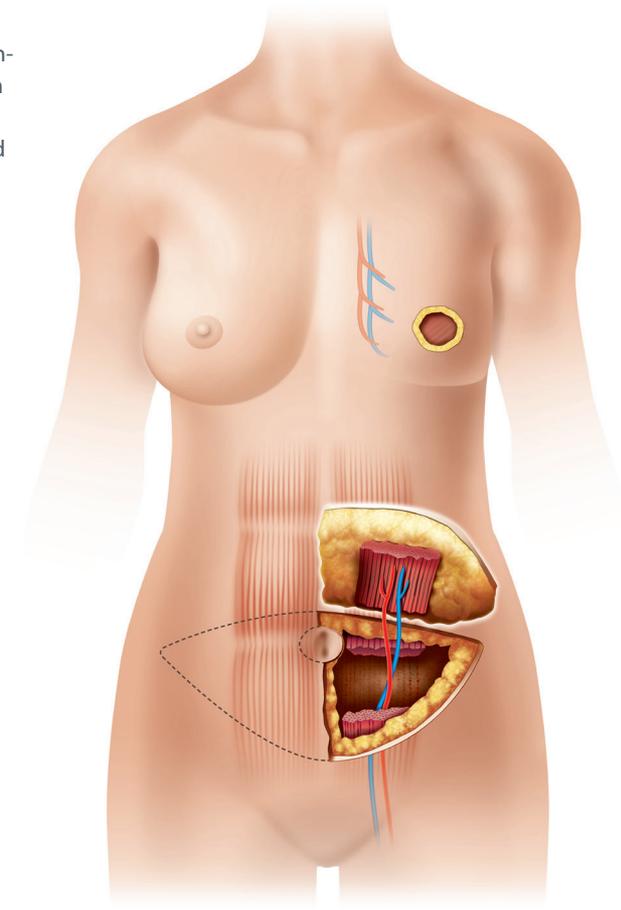
Unlike the “tunneling” that is used in the Pedicled TRAM Flap procedure, in the Free TRAM Flap, the surgeon will completely remove the abdominal skin, fat and muscle (including the blood vessels), then blood vessels are reattached to vessels in the chest using microsurgical techniques.

The Free TRAM Flap procedure is longer than the pedicled surgery because of the tedious nature of providing a new blood supply to the newly reconstructed breast.

The advantages of this procedure include again using the soft pliable tissue from the abdomen. This procedure has similar potential abdominal complications as the Pedicled TRAM Flap procedure, including bulges, hernias or weakness. Sometimes a synthetic mesh is placed inside the abdomen to help strengthen the area.

Using the abdominal tissue makes it easier to sculpt the breast, and over time, the reconstructed breast will change in similar fashion to the other breast. In the case of a double mastectomy, two breasts can be constructed if there is enough abdominal tissue.

The down side of this procedure is that the breast relies on microsurgical techniques to provide a blood supply which will have to be monitored for a few days after surgery.



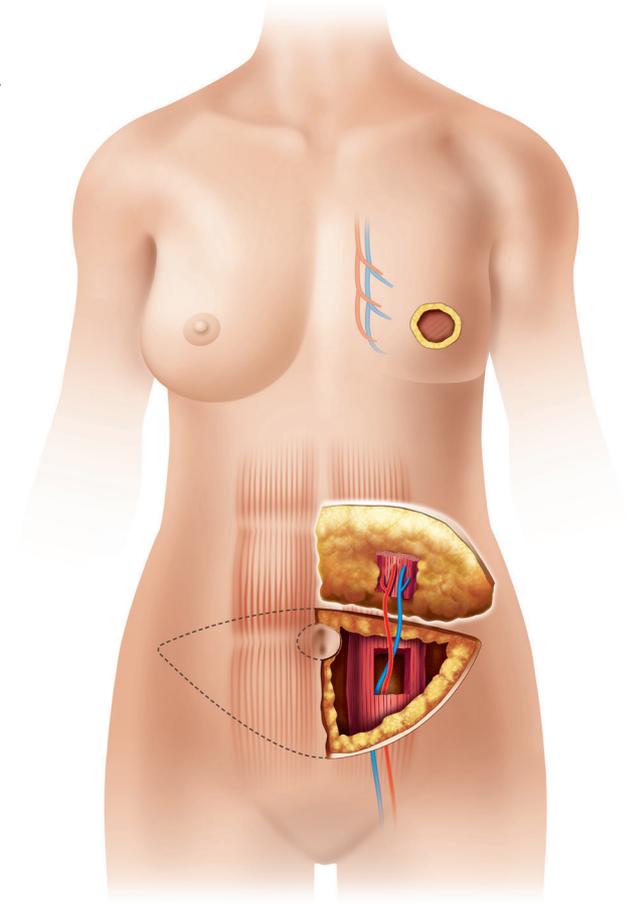
## Free Muscle-Sparing TRAM (*Transverse Rectus Abdominis Myocutaneous*) Flap

Like the other TRAM Flap procedures, the muscle-sparing surgery includes skin, fat and muscle, but less muscle tissue than the previous two.

Because some muscle is removed from the abdomen, the abdomen can become weakened and there is a risk for developing a hernia. Sometimes, a synthetic mesh is placed inside the abdomen to help strengthen the area.

This procedure is often viewed as having less risk of complications because very little muscle is removed from the abdomen.

Again, the advantages include using the soft pliable tissue from the abdomen to recreate the breast. The disadvantage is that the breast again relies on microsurgical techniques to provide a blood supply, which will have to be monitored for a few days after surgery.



### Free DIEP (*Deep Inferior Epigastric Perforator*) Flap

The DIEP Flap procedure doesn't take any muscle tissue, yet like other procedures, skin and fat from the abdomen is removed and used to construct the breast. The blood vessels from the abdomen tissue are connected to vessels in the chest.

The benefit of the DIEP Flap procedure is that the breast reconstruction involves the soft, living tissue of the abdomen without sacrificing important functioning abdominal muscles. The strength layer of the abdomen is also preserved, reducing the risk of hernias or bulges.

Depending on how much abdominal tissue is available, reconstruction may be done on both breasts using a single donor site.

Many women like the DIEP Flap option because it also potentially improves on the lower abdominal contour in addition to the breast reconstruction.

In any of the reconstruction procedures using abdominal tissue, you will have a scar across your abdomen below the belly button and on the reconstructed breast.

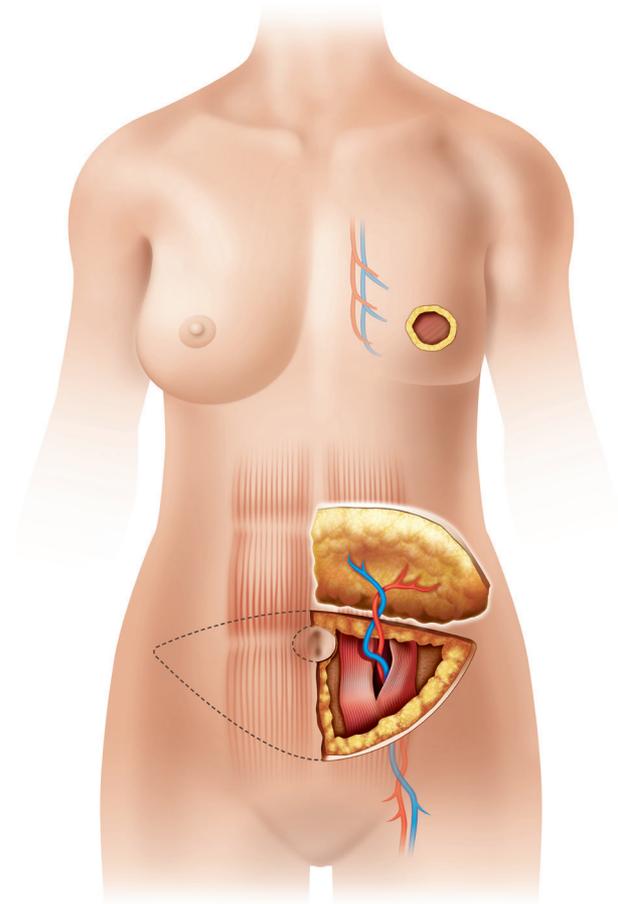
### Free SIEA (*Superficial Inferior Epigastric Artery*) Flap

The SIEA Flap procedure is very similar to the DIEP Flap, both using the skin and fatty tissue from the lower abdomen to reconstruct the breast. The difference is in vessels that are used to provide the blood supply to the new breast tissue.

The SIEA Flap relies on blood vessels that are located closer to the surface of the abdomen. Only 15% of all patients have adequate blood vessels and can have this surgery.

Using abdominal tissue provides the same benefits of the DIEP Flap – an improved lower abdominal contour. Since abdominal muscles are not disturbed, there is little risk for abdominal weakness.

The difference between the DIEP and SIEA Flap procedures is that with the SIEA, the abdominal muscle and strength layer of the abdomen are essentially undisturbed. Patients will not know which procedure they will have until they are in surgery and the surgeon is able to evaluate the blood vessels to determine if a SIEA procedure is possible.

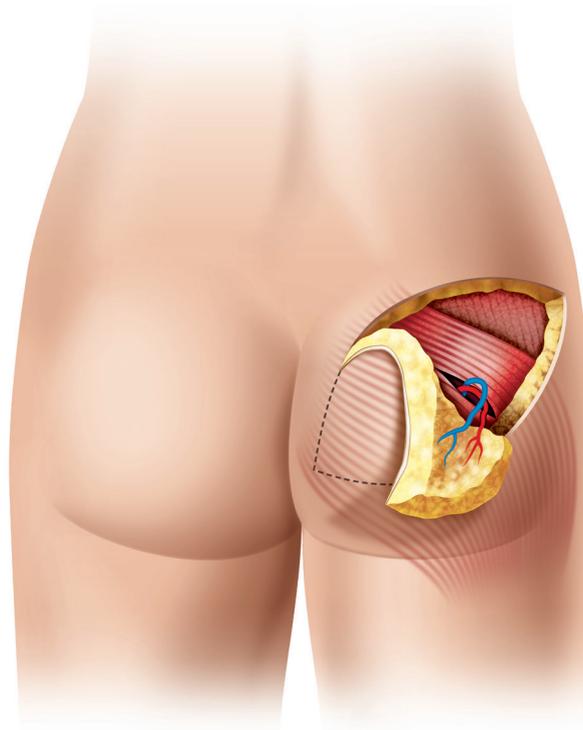


## SGAP (*Superior Gluteal Artery Perforator*) Flap

Another available donor site is the top of the buttocks. This procedure is generally used if the patient doesn't have enough abdominal tissue or has had previous surgeries that would prevent the use of additional abdominal tissue.

The SGAP Flap requires a skilled surgeon who is familiar with microsurgical techniques. In this surgery, skin and fat are removed from the top of the buttocks and used for the breast reconstruction.

SGAP is typically only a good fit for a select type of patient and is performed much less often than other donor site flap reconstruction procedures.



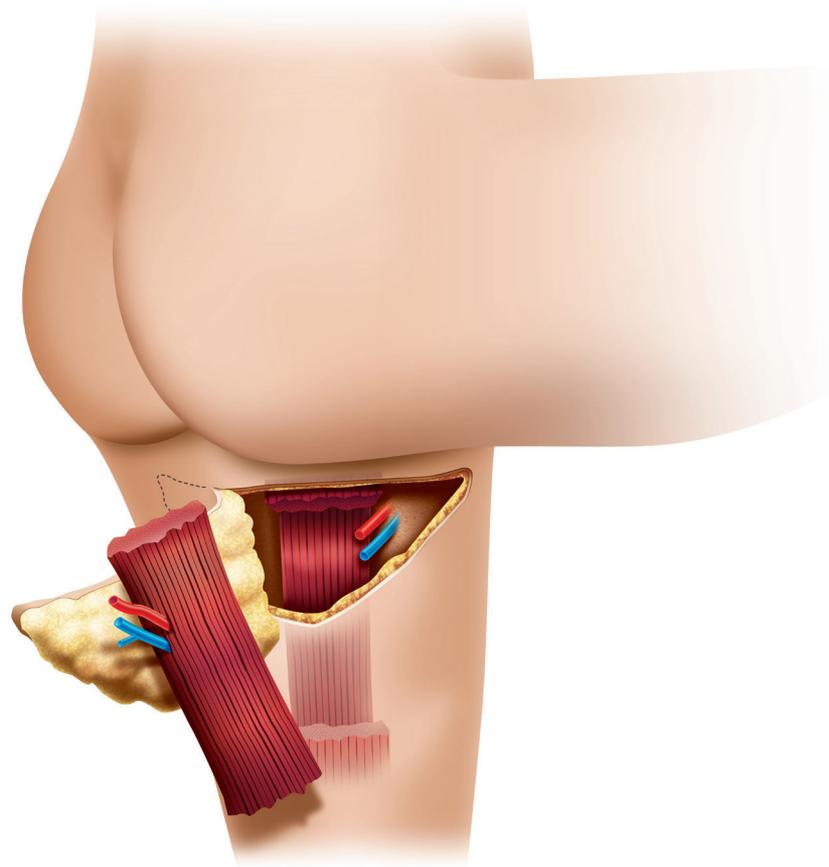
## TUG (*Transverse Upper Gracilis*) Flap

In the TUG Flap procedure, the donor tissue is taken from the inner upper thigh near the groin area. Generally less tissue can come from this area, so this procedure is often considered by women with smaller breasts who don't require as much tissue for reconstruction.

In the TUG Flap procedure, skin, fat and part of the gracilis muscle is removed and microsurgical procedures are done to connect blood vessels to vessels in the chest.

The TUG Flap procedure may be a good option for women who aren't good candidates for TRAM, DIEP or SIEA Flaps.

Patients like this procedure because the scarring in the donor area can be hidden. The thigh may appear "tighter," as if you have had an inner thigh "lift." Similar to SGAP, TUG is typically only a good fit for a select type of patient and is performed much less often than other donor site flap reconstruction procedures.



Your surgeon may suggest follow-up procedures to help you achieve the look that is best for you.

## Additional Surgeries After Reconstruction

When you discuss breast reconstruction with family and friends, everyone will have an opinion of what you should do. It is important that you make the final decision based on your personal aesthetic and lifestyle preferences.

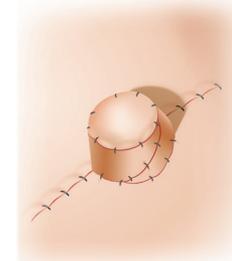
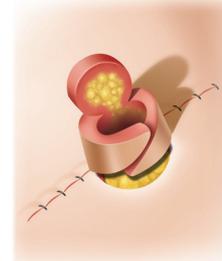
Some of the decisions you and your surgeons make will be reconstructive and others will be cosmetic. Some decisions will be based on whether or not you have had one breast removed or both. All breast procedures will leave some permanent scarring. Most scars will fade over time, and can be covered by bathing suits or clothing.

You and your doctor will go over the advantages and disadvantages of each option, mapping out a plan that works best for you, your health and your lifestyle. Some revision procedures that are done following breast reconstruction surgery include:

### Nipple and Areola Reconstruction

If you choose to have your nipple and areola reconstructed, most surgeons will schedule that surgery a few months after reconstruction in order for the swelling to go down and the reconstructed breast to “settle” into its shape and position. Some nipple reconstruction can be done at the initial surgery. You and your doctors can discuss timing.

Nipple and areola reconstruction are performed to produce a reconstructed breast that closely matches your natural breast. Reconstructed nipples have little to no sensation when touched. These procedures are performed on an outpatient basis, and most women have very little discomfort at the site of the reconstructed nipple.





Plastic surgery is a field that is changing and advancing all the time. An area of advancement over the years has been in microsurgical techniques. I feel fortunate that in my area of specialty—breast reconstruction—I can work with women to really understand what they are going through, and help provide them with the comfort they need to get through a very difficult time.

– Adeyiza Momoh, MD

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Watch Dr. Adeyiza Momoh describe the reconstruction experience at [www.UofMHealth.org/YourOptions](http://www.UofMHealth.org/YourOptions)

### **Nipple Reconstruction Options**

Nipple and areola reconstruction is a very personal choice.

A common option is to use a small flap of skin from the reconstructed breast to recreate a nipple.

To recreate the areola or darker circle around the nipple, the surgeon can use skin from the outer edge of the mastectomy scar or from donor skin from another part of your body, depending on the type of reconstructive surgery.

The skin used for the areola can be tattooed to match the color of your natural nipple. This procedure would be done after the reconstruction site has healed.

### **Breast Lift**

Depending on your age, a newly reconstructed breast may not droop like your natural breast, and therefore can look more youthful than the natural breast. A breast lift, or mastopexy, of the natural breast may help your breasts look more even.

A breast lift is done after the initial mastectomy surgery. In this procedure, excess skin is removed and the surrounding tissue is tightened to reshape the breast.

A breast lift does not change your breast size. This procedure will result in some scarring and possible diminished sensation in your nipple or breast.

### **Breast Augmentation**

If your natural breast is smaller than your reconstructed breast, you may choose to follow up your mastectomy surgery with breast augmentation or mammoplasty. Using an implant filled with either silicone gel or a saline solution, your doctor can make your natural breast better match the reconstructed breast.

Breast augmentation will increase size to achieve better symmetry of the breast. Breast augmentation will not correct severely drooping breasts. Your doctor can perform a breast lift at the same time as a breast augmentation to provide the desired result.

Screening mammograms will still be needed after augmentation. Women should be screened at centers with experience performing mammograms on patients who have implants.

### **Breast Reduction**

The opposite of breast augmentation, breast reduction surgery can be performed on the natural breast if it is larger than the reconstructed breast. Again, the procedure is done following the initial mastectomy.

In most situations, fat, glandular tissue and skin will be removed and the breast reshaped. The reduced breast appears smaller and lifted.

## Terms to Know

**Areola:** The darker skin surrounding the nipple. If a nipple is reconstructed, the skin around the reconstructed nipple can be tattooed to look more like the other breast's areola. Generally, nipple reconstruction is done in a separate procedure following the breast reconstruction.

**Augmentation Mammoplasty:** Breast augmentation.

**Delayed Reconstruction:** Waiting until a later time to have breast reconstruction. Not all reconstruction can be done at the time of the initial surgery.

**Donor Site:** The location on your body where your surgeon will harvest the skin, fat and muscle for the reconstruction procedure.

**External Breast Prosthesis:** Breast forms used externally for women who have had a mastectomy or other form of breast-changing surgery, but have not had reconstructive surgery. External prosthesis come in a variety of forms and can be specifically designed for swimming and other sporting activities.

**Flap Procedures:** Generally categorized as either a Pedicled Flap or a Free Flap, depending on whether or not blood vessels are divided and reconnected when transferred to the breast.

**Free Flap Procedure:** Involves harvest of tissue with separation of associated blood vessels from one site and reconnection of these vessels at a new site (the chest in breast reconstruction).

**Gluteal Muscle:** The buttocks.

**Gracilis Muscle:** The upper inner thigh.

**Immediate Reconstruction:** Breast reconstruction at the time of the mastectomy.

**Implants:** A round or breast shaped device that is filled with either silicone gel or saline solution to form the shape of the breast. Your plastic surgeon will discuss which option is best for you, your body type and what end result you are trying to achieve.

**Latissimus Dorsi:** Muscle on the back of the shoulder blade.

**Mastectomy:** A surgical procedure to remove one or both breasts because of cancer.

**Mastopexy:** A breast lift.

**Natural Tissue Reconstruction:** Using muscle, skin and tissue from other parts of your own body for the breast reconstruction.

**Pedicled Flap Procedure:** The tissue is tunneled from one location in the body to the breast area, without dividing the original blood supply.

**Reduction Mammoplasty:** Breast reduction.

**Superior Gluteal Muscle:** The top of the buttocks.

**Tissue Expansion:** Inserting an expander within the mastectomy site to stretch the skin and muscle until a desired size is achieved.

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*More information can be obtained from our website: [www.UofMHealth.org/YourOptions](http://www.UofMHealth.org/YourOptions).*



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