

TISSUE FLAP SURGERY

Quick Summary of Section

Tissue Flap Surgery

- In tissue flap surgery, a reconstructive plastic surgeon builds a new breast-like shape from muscle, fat, and skin taken from other parts of your body (usually your belly, back, or buttock).

Autologous tissue

- Different sites in the body can provide flaps for breast reconstruction. Pedicled flap vs free flap.

Reconstruction with Autologous Tissue

- Surgery and recovery; Possible complications

Abdomen: TRAM flap

- Tissue comes from the lower abdomen as in a DIEP flap but includes muscle. It can be either pedicled or free.

Abdomen: DIEP flap

- Tissue comes from the abdomen and contains only skin, blood vessels, and fat, without the underlying muscle. This type of flap is a free flap..

Abdomen: SIEA flap

- Tissue comes from the abdomen as in a DIEP flap but includes a different set of blood vessels. It also does not involve cutting of the abdominal muscle and is a free flap.

Back: Latissimus dorsi flap (LAT flap)

- Tissue comes from the middle and side of the back. This type of flap is pedicled when used for breast reconstruction.

Buttock (gluteal) flap

- A gluteal flap is a free flap procedure that takes tissue from your buttocks and transplants it to your chest area..

Thigh flaps (TUG) and (IGAP)

- Transverse upper gracilis (TUG) flap, uses muscle and fatty tissue from the bottom of the buttocks to the inner thigh.

Nipple Reconstruction

- After the chest heals from reconstruction surgery and the position of the breast mound on the chest wall has had time to stabilize, a surgeon can reconstruct the nipple and areola.

<p>Tissue Flap Surgery</p> <p><i>(Also see below)</i></p>	<p>In tissue flap surgery, a reconstructive plastic surgeon builds a new breast-like shape from muscle, fat, and skin taken from other parts of your body (usually your belly, back, or buttock).</p> <ul style="list-style-type: none"> • This new breast-like shape should last the rest of your life. • Women who are very thin or obese, smoke, or have serious health problems often cannot have tissue flap surgery. • Healing after tissue flap surgery often takes longer than healing after breast implant surgery. • You may have other problems, as well. For example, if you have a muscle removed, you might lose strength in the area from which it was taken. • You may get an infection or have trouble healing. • Tissue flap surgery is best done by a reconstructive plastic surgeon who has special training in this type of surgery and has done it many times before. <p><i>NIH NCI (10)</i></p>
<p>Autologous tissue</p>	<p>In autologous tissue reconstruction, a piece of tissue containing skin, fat, blood vessels, and sometimes muscle is taken from elsewhere in a woman’s body and used to rebuild the breast. This piece of tissue is called a flap.</p> <ul style="list-style-type: none"> • Different sites in the body can provide flaps for breast reconstruction. • Flaps used for breast reconstruction most often come from the abdomen or back. However, they can also be taken from the thigh or buttocks. <p>Depending on their source, flaps can be pedicled or free.</p> <ul style="list-style-type: none"> • With a pedicled flap, the tissue and attached blood vessels are moved together through the body to the breast area. Because the blood supply to the tissue used for reconstruction is left intact, blood vessels do not need to be reconnected once the tissue is moved. • With free flaps, the tissue is cut free from its blood supply. It must be attached to new blood vessels in the breast area, using a technique called microsurgery. This gives the reconstructed breast a blood supply. • Flaps taken from the thigh or buttocks are used for women who have had previous major abdominal surgery or who don’t have enough abdominal tissue to reconstruct a breast. These types of flaps are free flaps. With these flaps an implant is often used as well to provide sufficient breast volume. • In some cases, an implant and autologous tissue are used together. For example, autologous tissue may be used to cover an implant when there isn’t enough skin and muscle left after mastectomy to allow for expansion and use of an implant. <p><i>NIH NCI (10)</i></p>

<p>Reconstruction with Autologous Tissue</p>	<ul style="list-style-type: none"> • Surgery and recovery <ul style="list-style-type: none"> ○ Longer surgical procedure than for implants ○ The initial recovery period may be longer than for implants ○ Pedicled flap reconstruction is usually a shorter operation than free flap reconstruction and usually requires a shorter hospitalization ○ Free flap reconstruction is a longer, highly technical operation compared with pedicled flap reconstruction that requires a surgeon who has experience with microsurgery to re-attach blood vessels • Possible complications <ul style="list-style-type: none"> ○ Necrosis (death) of the transferred tissue ○ Blood clots may be more frequent with some flap sources ○ Pain and weakness at the site from which the donor tissue was taken ○ Obesity, diabetes, and smoking may increase the rate of complications • Other considerations <ul style="list-style-type: none"> ○ May provide a more natural breast shape than implants ○ May feel softer and more natural to the touch than implants ○ Leaves a scar at the site from which the donor tissue was taken ○ Can be used to replace tissue that has been damaged by radiation therapy • All women who undergo mastectomy for breast cancer experience varying degrees of breast numbness and loss of sensation (feeling) because nerves that provide sensation to the breast are cut when breast tissue is removed during surgery. However, a woman may regain some sensation as the severed nerves grow and regenerate, and breast surgeons continue to make technical advances that can spare or repair damage to nerves. • Any type of breast reconstruction can fail if healing does not occur properly. In these cases, the implant or flap will have to be removed. If an implant reconstruction fails, a woman can usually have a second reconstruction using an alternative approach. <p><i>NIH NCI (9)</i></p>
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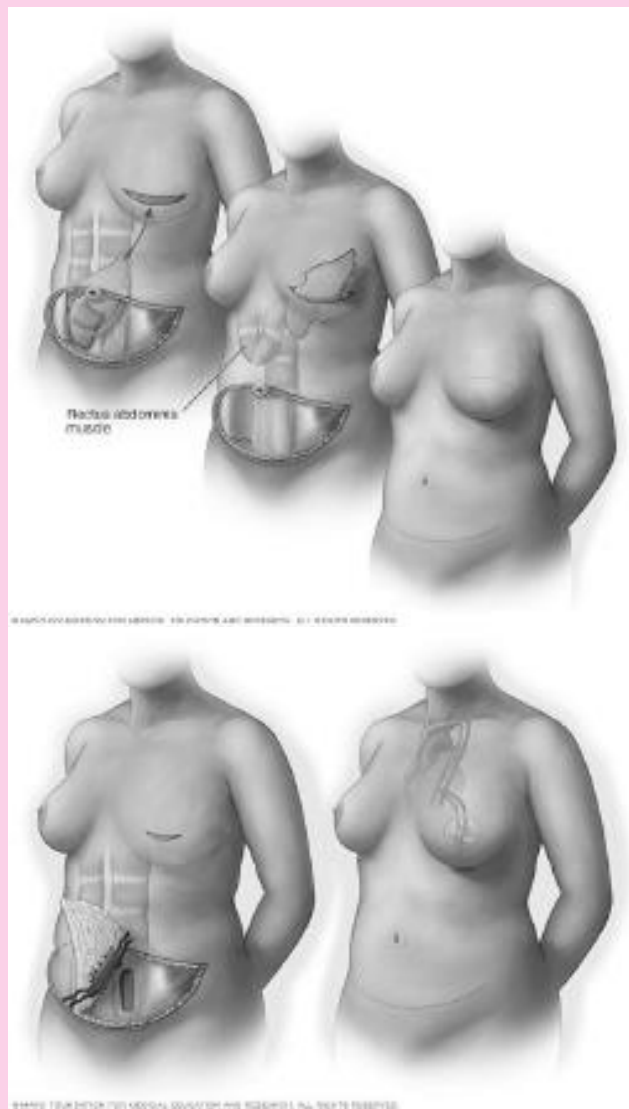
**Abdomen:
TRAM flap**

Tissue comes from the lower abdomen as in a DIEP flap but includes muscle. It can be either pedicled or free. *NIH NCI (9)*

- Your surgeon removes tissue — including muscle — from your abdomen in a procedure known as a transverse rectus abdominis muscle (TRAM) flap.
- The TRAM flap can be transferred as a free flap or a pedicled flap.
- A pedicled TRAM flap uses your whole rectus muscle — one of the four major muscles in your abdomen.
- For a muscle-sparing free TRAM flap, your surgeon takes only a portion of your rectus abdominis muscle, which may help you retain abdominal strength after surgery.

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Pedicled Tram Flap (top) and Free TRAM Flap (bottom) – Pictures from Mayo Clinic



Mayo Clinic - <https://www.mayoclinic.org/tests-procedures/breast-reconstruction-flap/about/pac-20384937>

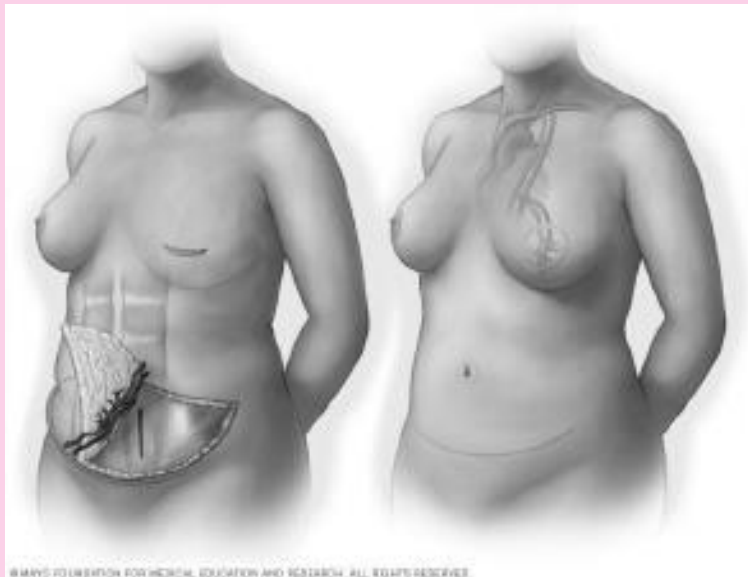
**Abdomen:
DIEP flap**

Tissue comes from the abdomen and contains only skin, blood vessels, and fat, without the underlying muscle. This type of flap is a free flap. *NIH NCI (11)*

- A newer procedure, deep inferior epigastric perforator (DIEP) flap, is similar to a TRAM flap, but only skin and fat are removed.
- Most of the abdominal muscle is left in place and minimal muscle tissue is taken to form the new breast mound.
- Reattaching blood vessels requires expertise in surgery through a microscope (microsurgery).
- An advantage to this type of breast reconstruction is that you'll retain more strength in your abdomen. If your surgeon can't perform a DIEP flap procedure for anatomical reasons, he or she might opt for the TRAM procedure instead.

Mayo Clinic - Breast reconstruction with flap surgery

DIEP flap – Pictures from Mayo Clinic



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**Abdomen:
SIEA flap (also
called SIEP flap)**

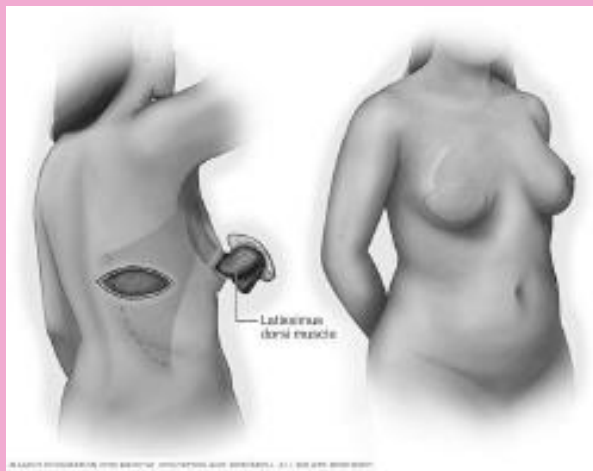
Tissue comes from the abdomen as in a DIEP flap but includes a different set of blood vessels. It also does not involve cutting of the abdominal muscle and is a free flap. This type of flap is not an option for many women, as the necessary blood vessels are not adequate or do not exist. *NIH NCI (9)*

- A variation of the DIEP flap, the superficial inferior epigastric artery (SIEA) flap uses the same abdominal tissue but relies on blood vessels that aren't as deep within the abdomen.
- This provides a less invasive option, but not all women's SIEA blood vessels are adequate for this type of flap surgery.

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<p>Back: Latissimus dorsi flap (LAT flap)</p>	<p>Tissue comes from the middle and side of the back. This type of flap is pedicled when used for breast reconstruction. (LD flaps can be used for other types of reconstruction as well.) <i>NIH NCI (9)</i></p> <ul style="list-style-type: none"> • This surgical technique takes skin, fat and muscle from your upper back, tunneling it under your skin to your chest. • Because the amount of skin and other tissue is generally less than in a TRAM flap surgery, this approach may be used for small and medium-sized breasts or for creating a pocket for a breast implant. • Although uncommon, some women experience muscle weakness in the back, shoulder or arm after this surgery. <p><i>Mayo Clinic - Breast reconstruction with flap surgery</i></p>
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Latissimus dorsi (LD) flap



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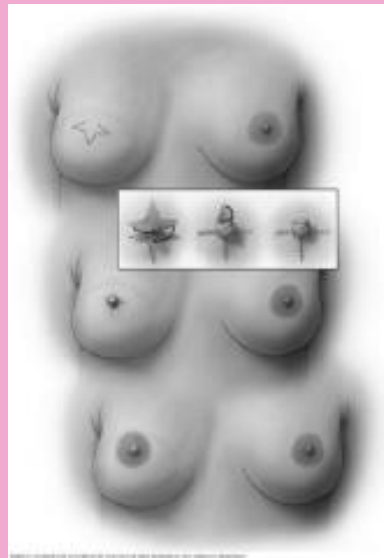
<p>Buttock (gluteal) Flap</p>	<p>A gluteal flap is a free flap procedure that takes tissue from your buttocks and transplants it to your chest area. A gluteal flap may be an option for women who prefer tissue reconstruction but who don't have enough extra tissue in their backs or abdomens. <i>Mayo Clinic.org</i></p> <ul style="list-style-type: none"> • PAP flap: Tissue, without muscle, that comes from the upper inner thigh. • SGAP flap: Tissue comes from the buttocks as in an IGAP flap, but includes a different set of blood vessels and contains only skin, blood vessels, and fat. <p><i>NIH NCI (9)</i></p>
<p>Thigh Flaps (TUG) and (IGAP)</p>	<p>Inner thigh (TUG). Another newer option, the transverse upper gracilis (TUG) flap, uses muscle and fatty tissue from the bottom of the buttocks to the inner thigh. TUG flap surgery, which isn't available everywhere, may be an option for women whose thighs touch and who have small to medium-sized breasts. <i>Mayo Clinic.org</i></p> <ul style="list-style-type: none"> • IGAP flap: Tissue comes from the buttocks and contains only skin, blood vessels, and fat. • TUG flap: Tissue, including muscle that comes from the upper inner thigh. <p><i>NIH NCI (9) and (11)</i></p>

Nipple Reconstruction

After the chest heals from reconstruction surgery and the position of the breast mound on the chest wall has had time to stabilize, a surgeon can reconstruct the nipple and areola.

- Usually, the new nipple is created by cutting and moving small pieces of skin from the reconstructed breast to the nipple site and shaping them into a new nipple. A few months after nipple reconstruction, the surgeon can re-create the areola, usually using tattoo ink. However, in some cases, skin grafts may be taken from the groin or abdomen and attached to the breast to create an areola at the time of the nipple reconstruction.
- Some women who do not have surgical nipple reconstruction may consider getting a realistic picture of a nipple created on the reconstructed breast from a tattoo artist who specializes in 3-D nipple tattooing.
- A mastectomy that preserves a woman's own nipple and areola, called nipple-sparing mastectomy, may be an option for some women, depending on the size and location of the breast cancer and the shape and size of the breasts.
- *NIH NCI (9)*

Nipple Reconstruction



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John Hopkins Medicine – Tissue Expander *YouTube Video* <https://www.youtube.com/watch?v=J9B23xnIoTw>

John Hopkins Medicine - Tissue Expanders

https://www.hopkinsmedicine.org/breast_center/treatments_services/reconstructive_breast_surgery/tissue_expanders.html

Mayo Clinic - Breast reconstruction with flap surgery - <https://www.mayoclinic.org/tests-procedures/breast-reconstruction-flap/about/pac-20384937>

NIH NCI (10) <https://www.cancer.gov/types/breast/surgery-choices>

NIH NCI (11) <https://www.cancer.gov/types/breast/reconstruction-fact-sheet>