

# BREAST RECONSTRUCTION ACTION PLAN

**CHOOSING THE PROCEDURE  
THAT'S RIGHT FOR YOU**

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Southern California Permanente Medical Group

[KPACTIONPLANS.ORG/BREASTRECON](https://kpaactionplans.org/breastrecon)



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Please be aware that some of the material that follows may be upsetting. There are pictures and descriptions of pathological conditions, operations, procedures and complications related to breast cancer, breast reconstruction, and other medical conditions. Viewer discretion is advised.

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## WELCOME TO YOUR GUIDEBOOK ON BREAST RECONSTRUCTION

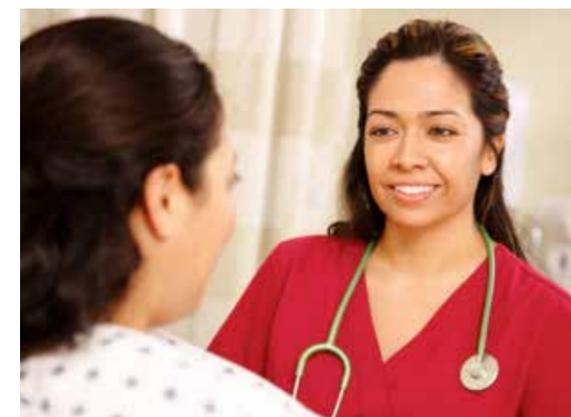
Chances are, you're reading this guidebook because you've recently been told you have breast cancer and are probably still reeling from the diagnosis. It's normal for you to feel confused, scared and generally overwhelmed right now. It may be too soon for you to even think about breast reconstruction. Or maybe, you're certain that reconstruction is right for you.

Either way, it's OK.

What's important for you to know right now is you can have breast reconstruction if you're having a mastectomy or lumpectomy. We encourage you to use this guidebook to help you decide:

- If you want to have reconstruction
- If you want reconstruction right away, or later
- If you want reconstruction using an implant or tissue from your own body

*THE MORE YOU KNOW ABOUT BREAST RECONSTRUCTION,  
THE BETTER YOU CAN PARTNER WITH YOUR CANCER CARE TEAM  
IN MAKING DECISIONS ABOUT YOUR CARE.*



The more you know, the better you can partner with your cancer care team in making decisions about your care.

### **BREAST RECONSTRUCTION IS A CHOICE — YOUR CHOICE**

You'll probably get all sorts of opinions about what you should do, but this is *your* decision. Many women want reconstruction to help them feel "whole" again. For them,



having breasts improves their self-image, confidence and quality of life. For other women, breasts aren't that important. They may decide to wear a prosthesis or "go flat."

Take your time and think about your options. You can make your decision today, tomorrow or years after your cancer surgery - there's no time limit.

Share this guidebook with your family and

**Breast reconstruction is a surgical procedure to create a new breast for you after a mastectomy or lumpectomy.**

**BREAST RECONSTRUCTION**

**ADVANTAGES**

- Creates a nice breast shape
- May help you feel more "normal"
- May help you feel better about yourself
- May help erase a reminder of your breast cancer

**DISADVANTAGES**

- "New" breast will never exactly match "old" breast
- Involves multiple surgeries
- Lengthens recovery and healing time
- Possibly more scarring than for mastectomy alone
- Possible complications may result in additional surgery or loss of an implant
- Possibly delay cancer therapy

**EXTERNAL BREAST PROSTHESIS**

**ADVANTAGES**

- No additional risks of surgery after mastectomy
- No need for opposite breast surgery to achieve symmetry
- No additional scars after mastectomy
- Excellent match to the opposite breast when in clothing
- Can have delayed reconstruction, if unhappy with prosthesis

**DISADVANTAGES**

- Only gives the appearance of a breast when clothed
- Can be heavy and hot

friends to help them understand what you may be going through emotionally and physically.

**A PLASTIC SURGEON PERFORMS YOUR BREAST RECONSTRUCTION**

Breast reconstruction is performed by a plastic surgeon who is a member of the large breast cancer team which will be caring for you. Other team members include doctors and nurses from many different departments including primary care, general surgery, radiology, anesthesiology, oncology and radiation oncology.

**BREAST RECONSTRUCTION IS A COVERED BENEFIT**

The "Women's Health and Cancer Rights Act" of 1998 requires all health plans that cover mastectomies and lumpectomies to also cover:

- Breast reconstruction after mastectomy or lumpectomy
  - Opposite breast "adjustment" to achieve symmetry
  - A prosthesis (breast form) if you decide not to have surgical reconstruction
- You can have reconstruction or get a prosthesis at any time after your cancer surgery, even years later.

**IT'S GOOD TO KNOW**

Breast reconstruction is available to you, if you want it. But we don't expect you to make this important decision on your own or have your entire reconstruction planned from A-Z on day one. You and your plastic surgeon will make those decisions together, at the proper time, one step at a time.

Just know that we're here to care for you and we'll support whatever decision you make, whether or not you decide to have reconstruction.



**WHAT IS BREAST RECONSTRUCTION?**

Breast reconstruction is a non-cosmetic type of breast surgery for women who have had a disfigurement from infection, trauma or most commonly from procedures like a lumpectomy or mastectomy. Breast reconstruction surgery can rebuild the breast mound, nipple and areola, as needed, usually over a period of time and a series of separate procedures.

**CAN ALL WOMEN HAVE BREAST RECONSTRUCTION?**

Most women who have had part or all of a breast removed are able to have breast reconstruction. There are a variety of reconstructive options and you may not be a candidate for all types. You and your plastic surgeon will discuss which type of breast reconstruction is best for you.

**IS BREAST RECONSTRUCTION PART OF TREATMENT?**

No, breast reconstruction is not medically necessary. Breast reconstruction does not prevent, remove or treat any form of breast cancer in any way. Cancer treatments including lumpectomy, mastectomy,

chemotherapy, radiation and hormone therapy are designed to delay, prevent or remove breast cancer cells. Reconstruction is a separate procedure to rebuild a breast after a lumpectomy or mastectomy.

Breast reconstruction is an elective procedure, so you can choose to have it done or not. Breast reconstruction is a very personal process and not everyone in your support group may agree with your actions. Breast reconstruction is not for everyone. Don't feel pressured by outside influences to undergo a reconstruction if you do not wish to. Ultimately, you are the person who will have to live with your decisions.

**IS BREAST RECONSTRUCTION A COVERED BENEFIT?**

Yes, federal law requires insurance plans to pay for breast reconstruction whenever the patient decides to undergo the procedures.

**WHO WILL PERFORM MY BREAST RECONSTRUCTION?**

Breast reconstruction is done by a plastic surgeon who is a member of a large breast cancer team. Other team members include

doctors and nurses from many different departments including primary care, general surgery, radiology, anesthesiology, oncology and radiation oncology. The timing and the type of reconstruction you have may be significantly influenced by treatments from any one of these team members or your current medical and social situations. Your cancer treatment(s) will take priority over reconstruction.

**WHEN DO I SEE A PLASTIC SURGEON?**

You can see a plastic surgeon at any time after your breast cancer diagnosis. You do not need to have made a decision about whether or not to have breast reconstruction before you see a plastic surgeon. Your surgeon will help you make that decision.

**WHAT ARE THE NON-SURGICAL OPTIONS TO BREAST RECONSTRUCTION?**

Many women decide that they do not want to undergo any further surgeries after a mastectomy and may choose to "go flat" or wear a prosthesis.

**WHAT IS A BREAST PROsthESIS?**

A prosthesis is an artificial breast form that fits in a bra cup to give you the appearance of a natural breast under your clothing. There is no breast present when clothing is removed. Many women find wearing a prosthesis an effective and suitable long-term choice. You can always decide to undergo surgical reconstruction any time later if you are dissatisfied with a prosthesis.

**WHAT ARE THE ADVANTAGES OF A PROsthESIS?**

With this choice, there are no additional complication risks or increased recovery time after mastectomy. In addition, there are no additional scars after mastectomy. There is no need for surgery on the opposite breast so it matches the reconstructed breast.

## WHAT TO EXPECT DURING THE BREAST RECONSTRUCTION PROCESS

“Good things take time.” Right? That’s certainly true with breast reconstruction. Getting a “new” breast is much like taking a long trip. You might have smooth sailing or you might hit a few roadblocks. But knowing what to expect, you’ll be better prepared for the trip ahead.

Breast reconstruction is a complex procedure:

- More complicated than having a mastectomy
- More potential risks in rebuilding a breast than in removing it
- Typically requires 2-4 separate surgeries
- May take up to a year or more to complete

### TIMING OF BREAST RECONSTRUCTION

Reconstruction can begin either **immediately**, at the same time as your mastectomy surgery, or it can be **delayed** for as long as you wish.

### TYPICAL BREAST RECONSTRUCTION TIMELINE

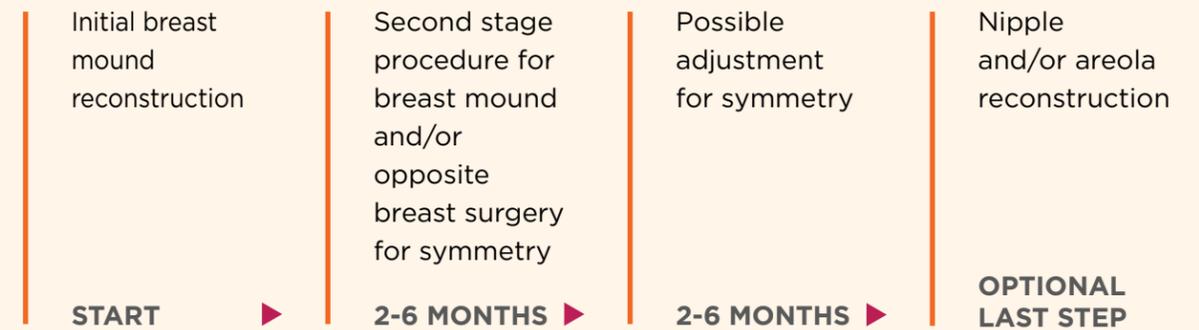
Reconstruction typically requires several separate surgeries and can take up to a year, from start to finish.



- Initial breast mound reconstruction. This first surgery is usually the most complicated in the reconstruction process.
- 2-6 months later, it’s common to have a planned second stage procedure to reconstruct the breast mound and/or perform surgery on the opposite breast to achieve symmetry.
- Sometimes, after another 2-6 months, additional surgery may be necessary to achieve symmetry.
- Reconstruct your nipple and areola, if desired.

It may take even more time and require more surgeries if you have complications either from your reconstruction or from your cancer therapy.

### TIMELINE OF THE RECONSTRUCTION PROCESS



### OPTIONS FOR BREAST RECONSTRUCTION

In most cases, you can choose the reconstruction procedure you want, although not every procedure is right for every woman. Your weight and body type, overall health, need for additional cancer therapy and the risks you’re willing to accept, all play a role in the type of reconstruction that may be best for you.

Options for reconstruction:

- **Implant** filled with saline or silicone
- **Autologous tissue reconstruction**, using your own tissue from your:
  - Abdomen (lower belly)
  - Back

Complications with one type of reconstruction could cause you to switch to another procedure or prevent you from completing the process.

### IT’S GOOD TO KNOW

Going through breast reconstruction takes a major commitment of your time, energy and patience. It’s a big decision and it’s not for everyone.

**BREAST RECONSTRUCTION IS MORE COMPLICATED THAN HAVING A MASTECTOMY, AND CARRIES A GREATER RISK OF COMPLICATIONS.**

It all comes down to what you want and what you’re willing to go through to complete a reconstruction. As long as you know what to expect, whatever decision you make is the right decision for you.

### WHAT ARE THE DIFFERENT TYPES OF RECONSTRUCTION PROCEDURES?

There are three major types of breast reconstruction.

- Silicone gel or saline implant reconstruction
- Autologous abdominal tissue reconstruction (using tissue from your belly)
- Autologous back tissue reconstruction (using tissue from your back)

Each method usually requires multiple surgeries and takes time to achieve a final result. Sometimes, your surgeon will use a combination of these methods to reconstruct your breast.

### CAN I CHOOSE THE RECONSTRUCTION PROCEDURE I HAVE?

In most cases, you can choose the reconstruction procedure you want, but not every procedure is right for every woman. Choosing the type of breast reconstruction to have depends on many factors including your personal preference, how much risk you're willing to accept and what you are willing to go through to

complete a reconstruction. It also depends on your body shape and weight, history of past surgeries, smoking history, current medical condition and whether or not you need further cancer treatment.

For example, most surgeons will not perform immediate reconstruction if you smoke. Smoking can reduce blood circulation, affecting your ability to heal and fight off infection. Too much or too little belly tissue might prevent you from having an autologous abdominal tissue reconstruction; implants could be a better choice. Not having enough back tissue could make abdominal tissue reconstruction a better choice. Your doctor will help you choose a reconstruction method that gives you the best chance for success.

### HOW LONG DOES IT TAKE TO RECOVER FROM RECONSTRUCTION SURGERY?

Recovery time can depend on many factors including the type of reconstruction procedure you have and your overall health. Keep in mind that reconstruction involves several surgical procedures and each requires time to recover.

Usually, for implant reconstruction, it takes about 2 to 6 weeks to recover from tissue expander placement and about 1 to 4 weeks to resume your normal activity after your permanent implant.

Generally, for the first back tissue reconstruction surgery, you can plan on a hospital stay of about 1 to 2 days and 2 to 6 weeks to get back to your normal activity.

For the first abdominal tissue reconstruction surgery, you can plan on a hospital stay of up to a week and about 4 to 8 weeks to recover.

### HOW LONG DOES IT TAKE TO COMPLETE THE RECONSTRUCTION PROCESS?

Breast reconstruction is a complex, multi-step process that can take up to a year. It may take longer if you have complications or need to delay reconstruction to have chemo or radiation therapies.

Here's a general reconstruction timeline:

- **Step 1:** First surgery to create a breast mound. This surgery is usually the most complicated procedure in the reconstruction process.
- **Step 2:** About 2 to 6 months later, a second surgery makes any changes to the reconstructed breast and/or makes adjustments to your opposite breast to achieve symmetry. Sometimes, a follow-up surgery will be needed to make adjustments to one or both breasts.
- **Step 3:** Surgery to reconstruct a nipple and areola.

## WHAT TO EXPECT FROM A RECONSTRUCTED BREAST



It's good to approach breast reconstruction knowing that the procedure will never give you a "perfect" breast. That's a job for

clothing, however, there will often be a noticeable difference.

A reconstructed breast will:

- Give you a breast shape
- Have some scarring, although the extent of the scars will be different from woman to woman

A reconstructed breast may:

- Improve your self-esteem and body image
- Help you feel more "normal"
- Help erase the physical reminders of your breast cancer

**THE MOST IMPORTANT THING IS THAT YOU FEEL COMFORTABLE WITH YOUR DECISION TO HAVE — OR NOT TO HAVE — BREAST RECONSTRUCTION AND ARE SATISFIED WITH THE RESULTS.**

Mother Nature, and even she can fall short of perfection.

What reconstruction will give you is a nice breast shape that will look close to the real thing in your bra and clothes. Without

A reconstructed breast will not:

- Look or feel exactly like the breast that was removed
- Produce milk
- Respond to stimulation



Immediate Implant Reconstruction



Delayed Implant Reconstruction



Immediate Autologous Reconstruction



Delayed Autologous Reconstruction



No Reconstruction

You can also expect your "new" reconstructed breast to look different from your "old" natural breast. Your plastic surgeon can surgically "adjust" your opposite breast to get a good match.

### IT'S GOOD TO KNOW

Reconstruction can't give you a "real" breast like the one you lost, but it will give you the best breast possible.

We want you to be happy with the results of your reconstruction and that begins with realistic expectations about what reconstruction can do — and what it can't.



**WILL A RECONSTRUCTED BREAST LOOK OR FEEL LIKE A NATURAL BREAST?**

No, a reconstructed breast will never look or function like the breast Mother Nature gave you. You will not feel the same sensations as you did with your former breast. This is not a “real” breast, but it will give you a nice breast shape under your clothes. Without clothing, you will notice a difference.

**WILL RECONSTRUCTION SURGERY LEAVE A SCAR?**

Yes. Scars will form after all surgeries.

There will be visible scars on the reconstructed breast, on the “normal” breast if symmetry surgery is performed, as well as on the back or abdomen if tissue is used from those areas. The scars on the two breasts may look different from each other. Their visibility will be dependent on each patient’s genetics and how they form a scar.

The scarring process usually takes up to a year. There is a great amount of variability with scar formation. Darker skin usually forms darker scars while lighter skin usually forms lighter scars. Sometimes scars can be irritated, itchy and even painful. Too much scarring may affect the size, shape and look of the breast.

**TIMING OF BREAST RECONSTRUCTION**

Usually, you can choose when to begin your breast reconstruction:

- **Immediately** at the same time as your mastectomy
- **Delayed** until weeks, months or even years after your mastectomy

**IMMEDIATE BREAST RECONSTRUCTION**

Your plastic surgeon joins your cancer surgeon in the operating room to begin reconstruction as soon as your mastectomy is complete.

**IMMEDIATE BREAST RECONSTRUCTION****ADVANTAGES**

- First step of reconstruction is performed at same time as mastectomy surgery
- Avoids an extra surgery and recovery period
- May shorten total reconstruction time
- Awaken from mastectomy surgery with the beginning of a breast shape
- Possibly smaller scars
- Possibly more natural breast shape

**DISADVANTAGES**

- Longer hospitalization and recovery times than for mastectomy alone
- Longer surgery than for delayed reconstruction
- Greater risk of complications, especially skin death and infection
- Possible delay of cancer therapies
- Must deal with cancer diagnosis/treatment and reconstruction at the same time
- Subsequent radiation, if needed, may “damage” reconstructed breast



If you have immediate reconstruction, you will have what’s called a “skin-sparing mastectomy.” In this procedure, your cancer surgeon removes your breast and nipple/areola complex through a smaller

**DELAYED BREAST RECONSTRUCTION**

There’s no clock ticking when it comes to reconstruction. You can delay it until after you’ve healed from your mastectomy, finished radiation or just need more time to consider your options.

If you have delayed reconstruction, your mastectomy surgeon will generally make a larger incision to remove your breast and nipple/areola complex and take more skin than if you have immediate reconstruction.

Delayed reconstruction may be right for you if:

- You have later stage breast cancer
- You will likely need radiation therapy

**BREAST RECONSTRUCTION IS NOT EMERGENCY SURGERY – YOU CAN USUALLY CHOOSE TO HAVE IT RIGHT AWAY OR WAIT AS LONG AS YOU WANT.**

incision, leaving behind as much skin as possible. This creates a “pouch” for your plastic surgeon to rebuild your breast mound using an implant or your own tissue.

Immediate reconstruction may be right for you if:

- You have earlier stage breast cancer
- You won’t need radiation, which may affect wound healing and can damage skin and tissue
- You don’t smoke. Most surgeons won’t perform immediate reconstruction if you smoke. Smoking can affect your ability to heal and fight infections.

**IT’S GOOD TO KNOW**

There are just as many reasons for choosing immediate reconstruction as there are for delaying it. Whatever you choose, your number one priority should be your health and survival. We want to avoid any possible complications which may interfere with your cancer treatment. That may mean delaying reconstruction until you complete treatment.

**DELAYED BREAST RECONSTRUCTION**

**ADVANTAGES**

- First step of reconstruction is performed after recovery from mastectomy surgery and cancer therapies
- Shorter surgery than for immediate reconstruction
- Reduced risk of complications, including skin death and infections
- Lower risk of needing to delay cancer therapies
- Time to try external breast prosthesis
- Time to consider breast reconstruction options
- Time to deal with cancer diagnosis/treatment before thinking about reconstruction

**DISADVANTAGES**

- Requires at least one more surgery and recovery time than for immediate reconstruction
- Longer scars than with immediate reconstruction
- Possibly less natural looking breast
- Makes it more difficult to achieve symmetry if you have a large opposite breast
- Sometimes mastectomy scars can make delayed reconstruction more difficult
- Emotional distress due to temporary lack of a breast

Your doctor may also want you to completely recover from your mastectomy surgery before you have reconstruction, especially if you have other medical concerns like diabetes, circulatory problems, severe obesity or a bleeding disorder.

You and your doctor will take all these factors into consideration as you decide on the best time to start your reconstruction.



**WHEN IS BREAST RECONSTRUCTION DONE?**

Breast reconstruction can be started at the same time as a disfiguring surgery like a lumpectomy or mastectomy. This is called immediate reconstruction. As soon as the breast cancer surgeon removes part or all of the breast, the plastic surgeon starts the reconstruction process. Breast reconstruction can also be done any time after a disfigurement due to cancer surgery, trauma or infection. This is called delayed reconstruction.

**WHAT ARE THE ADVANTAGES OF IMMEDIATE RECONSTRUCTION?**

Immediate reconstruction may result in a more natural looking breast with smaller scars after cancer surgery. It may decrease the number of surgeries and time required to complete your reconstruction because you've started reconstruction at the same time as your mastectomy surgery. There's also the psychological advantage of waking up from mastectomy surgery with the beginnings of a rebuilt breast (or breasts).

**WHAT ARE THE DISADVANTAGES OF IMMEDIATE RECONSTRUCTION?**

Immediate reconstruction generally carries a greater risk of complications due primarily to infection and skin loss from blood circulation problems. Medical problems and previous treatment including diabetes, breast size, previous surgery, smoking, chemotherapy and radiation may increase these risks. Complications of immediate reconstruction may delay your healing and thus delay your cancer treatments after mastectomy. You must be completely healed after surgery to continue with these treatments that will affect your survival. Therefore, a prohibitively high complication rate may make this option not good for some women. You will need to discuss your situation with your surgeon.

**WHO ARE THE BEST CANDIDATES FOR IMMEDIATE RECONSTRUCTION?**

In general, women may be good candidates for immediate reconstruction if they are willing to accept more risk in order to avoid waking up completely flat after their mastectomy. This technique is usually reserved for early clinically staged

breast cancer patients (Stages I and II) who do not require post mastectomy radiation. Radiation can delay healing and make infections harder to fight off. Immediate breast reconstruction is usually avoided in inflammatory breast cancer or if cancer spreads to other parts of the body (Stage IV). Most surgeons will not perform immediate breast reconstruction if you smoke. Smoking can delay healing causing incisions to open which increases the risks for infection.

**WHAT ARE THE ADVANTAGES OF DELAYED RECONSTRUCTION?**

By separating the cancer treatment process from the breast reconstruction process, women reduce "information overload." They can concentrate on beating the cancer first then dealing with reconstruction options and aesthetic outcomes later. Delayed reconstruction allows for a trial period with a breast prosthesis. Waiting to reconstruct the breast allows examination of the final pathology and determination of which cancer treatments may be required prior to beginning the reconstructive process. This ability to determine and complete all recommended cancer treatments separate from the reconstruction process can lower the risk of needing to delay cancer treatment due to complications.

**WHAT ARE THE DISADVANTAGES OF DELAYED RECONSTRUCTION?**

Delayed reconstruction leaves larger scars and a less natural looking reconstructed breast which makes it more difficult to achieve symmetry in unilateral breast reconstruction. Delaying reconstruction may be psychologically more traumatic for some women because you awake from your mastectomy completely flat. In addition, the reconstruction process is slower because it will increase the number of surgeries required to complete the process.

**WHO ARE THE BEST CANDIDATES FOR DELAYED RECONSTRUCTION?**

In general, patients who undergo delayed reconstruction want to reduce their risk for complications and don't mind being flat until completion of their cancer therapies. Surgeons recommend delayed reconstruction for large tumors in higher staged patients (Stages III and IV) who have a high likelihood for needing post-op radiation. Performing a delayed reconstruction after radiation usually requires some form of autologous (using your own tissue) breast reconstruction to improve form and lower risk.

## IMPLANT BREAST RECONSTRUCTION

An implant can be used to give you a nice breast shape under your clothing, although implants don't give you the same look, feel or movement as a natural breast.

Implants wear out over time. On average, they need to be replaced every 10-15 years because their outer shells can break or harden. Sometimes, implants may last a lot longer or may need replacement sooner rather than later.



### SALINE

Filled after placement and lasts 10-15 years



### SILICONE

Pre-filled and lasts 10-15 years



### "GUMMY BEAR"

Pre-filled and lasts 10-15 years

### TYPES OF BREAST IMPLANTS

There are three main types of breast implants. Each has a silicone outer shell; the difference is what's inside:



- **Saline implants** are round, filled with saline or sterile saltwater and tend to feel firmer than a silicone implant.
- **Silicone implants** are round, filled with silicone gel and generally feel softer and more natural than a saline implant.
- **"Gummy bear" implants** are a type of silicone gel implant that are teardrop shaped and are firmer than regular gel implants.



Breast Reconstruction Using Implants

### IMPLANT BREAST RECONSTRUCTION

#### ADVANTAGES

- No need for external prosthesis
- A single operative site compared to two operative sites with autologous tissue reconstruction
- Shorter surgery than autologous tissue reconstruction
- Faster recovery than for autologous tissue reconstruction
- Scars located only around the breast (because no donor sites involved)
- Many choices for breast size and shape

#### DISADVANTAGES

- Breast may not feel or move as naturally as autologous tissue reconstructions
- Tissue expansion process requires regular office visits over a period of time
- Separate procedures involved to place temporary tissue expanders and permanent implant
- Risk of implant rupture, infection, scarring, capsule contracture or malposition
- Implant wrinkling may be seen under thin skin
- Replacement may be needed every 10-15 years

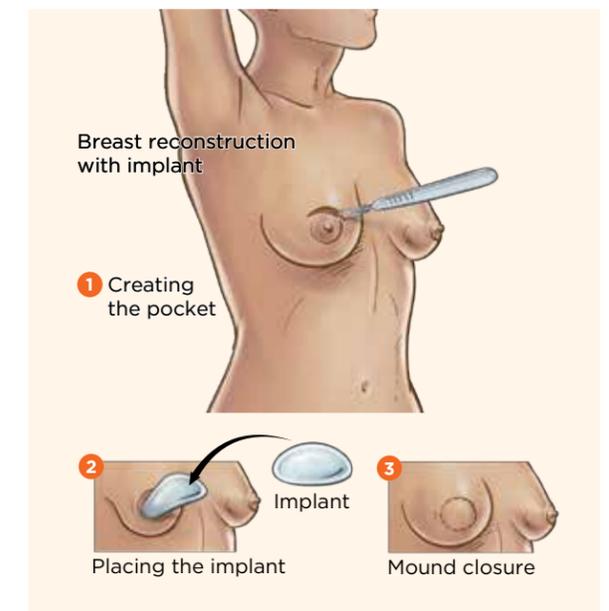
Your doctor will help you choose the implant that is most likely to give you the results you want.

### TIMING OF IMPLANT RECONSTRUCTION

Most women have the option of starting implant reconstruction **immediately** during a mastectomy surgery or it can be **delayed** for as long as you like.

### IMPLANT RECONSTRUCTION PROCESS

Implant reconstruction usually requires the use of a tissue expander to stretch the skin



and create a “pocket” for the implant. This can take several months.

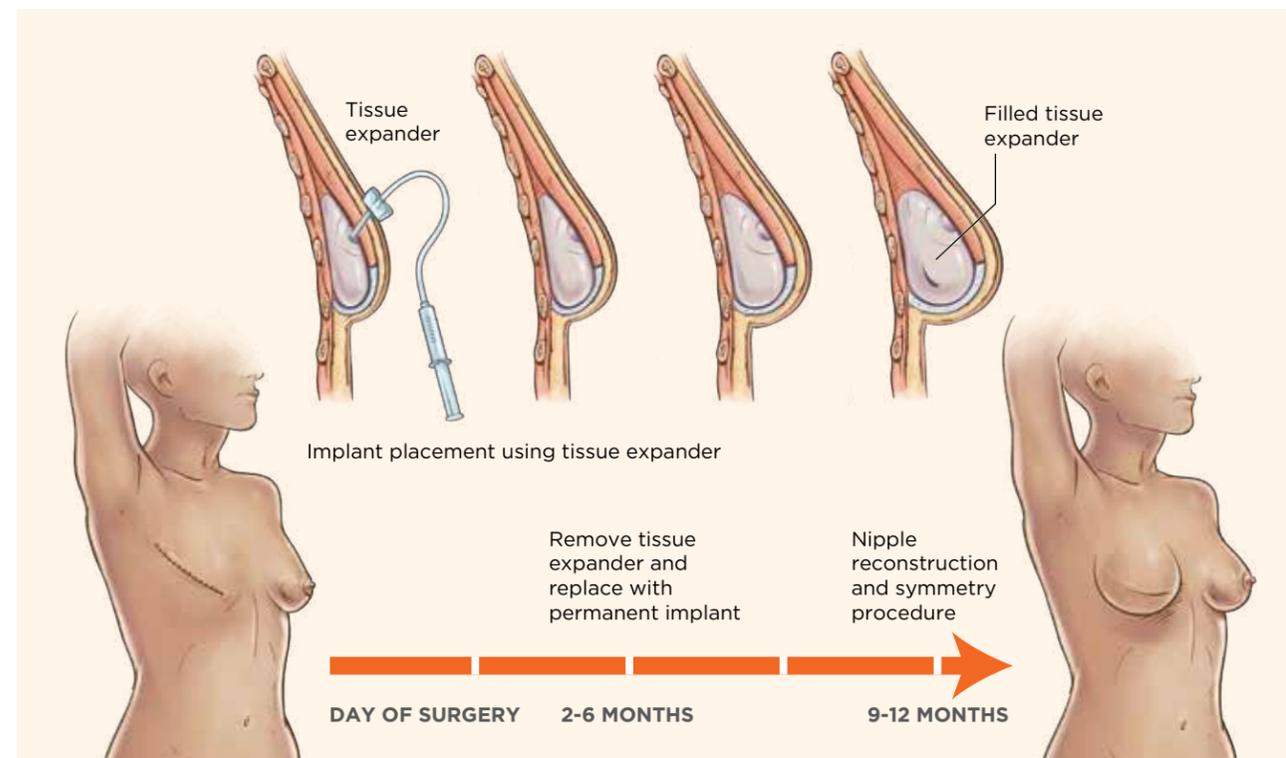
Sometimes, if you have immediate reconstruction and you have enough skin remaining after your mastectomy, you won’t need to go through the tissue expander process. Your permanent implant can be placed right away.

Implant reconstruction with a tissue expander:

- **Placing a temporary tissue expander:** A hard, shaped, temporary tissue expander is placed beneath your skin and chest muscle. Sometimes, your surgeon may also use acellular dermal matrix (cleaned and processed skin) to cover the expander or keep it in the

right place. The more tissue that covers your implant, the better the result.

- **Stretching the skin:** During the next few weeks or months, the tissue expander is slowly filled with saline to stretch the skin and muscle to create a “pocket” for the permanent implant. This is usually repeated every few weeks during an office visit.
- **Placing a permanent implant:** About 2-6 months after the expansion process is complete, the tissue expander is removed and replaced with a permanent saline or silicone implant. This usually completes breast mound reconstruction. Follow-up procedures may include opposite breast surgery to achieve symmetry and nipple and areola reconstruction.



**IMPLANT SAFETY**

Implant safety has been the subject of many research studies, and the results show that silicone and saline implants are safe to use. No connection has been found between silicone implants and the development of certain inflammatory diseases such as lupus and rheumatoid arthritis.

**RECOVERY**

Patients usually require 4-6 weeks to recovery from a tissue expander placement without complications. Tissue expansion may cause some soreness, discomfort or tightness for several days after expansion.

It usually takes about 1-4 weeks to recover from the placement of your permanent implant.

Typically, it takes less time to recover from implant reconstruction surgery than from the first surgery in autologous tissue reconstruction. This is primarily because you’re recovering from one surgical site with an implant rather than two surgical sites (belly or back) with autologous tissue reconstruction.

*AN IMPLANT GIVES YOU MANY OPTIONS ABOUT THE SIZE AND SHAPE OF YOUR “NEW” BREAST.*

**HAVING A MAMMOGRAM WITH AN IMPLANT**

Although implants are safe, they can block the view of a tumor on a mammogram. To meet this challenge, we use a special mammography technique to move the implant out of the way to get a clear view of the breast tissue. Even so, there’s still a risk for missing some cancers, especially in the early stages.



Of course, your general health, need for additional cancer treatments, smoking history and complications could lengthen your recovery time.

### POSSIBLE COMPLICATIONS

- Infection
- Skin death (necrosis) caused by poor circulation over the implant
- Pooling of fluid within the breast pocket (seroma)
- Pooling of blood within the breast pocket (hematoma)
- Excessive scar formation on the implant, causing the implant to feel hard or contract
- Implant wrinkling (implant wrinkles can be seen through the skin)
- Implant leak or rupture
- If a saline implant leaks or ruptures, the implant will collapse. The leaking saline is absorbed and naturally expelled by the body.
- If a silicone implant leaks or ruptures, the implant will not collapse. The gel may remain within the implant shell, or may escape into the breast implant pocket or surrounding tissues.
- Implant shifts in position or ends up sitting in the wrong place
- Implant erosion and exposure (the tissue covering the implant may thin and possibly open)

Some of these complications may require further surgery. In the most serious cases,



your implant may need to be replaced or removed.

We can't guarantee you won't have a problem, but if you do, we'll do our best to take care of you and be your guide through any difficult situations.

### IT'S GOOD TO KNOW

Getting an implant requires a good deal of patience on your part. It can take a number of visits to inflate your tissue expander and insert the permanent implant.

But for many women, it's worth the time and effort. An implant can be an especially good option if you want a shorter recovery than for an autologous reconstruction or if you don't have enough extra tissue on your belly or back to create a new breast or if you want to avoid incisions and scars on your belly or back.

You and your doctor will discuss what's best for you.

### WHAT TYPES OF IMPLANTS ARE AVAILABLE?

There are several types of implants available. Your plastic surgeon will help you choose the type of implant that will give you the best breast shape possible.

Saline breast implants are filled with sterile salt water. If the implant shell leaks, a saline implant will collapse and the saline will be absorbed and naturally expelled by the body.

Silicone breast implants are filled with silicone gel which feels similar to natural breast tissue. If the implant shell leaks, the gel may remain within the implant shell, or may escape into the breast implant pocket or surrounding tissues. A leaking implant filled with silicone gel will not collapse. A gummy bear implant is a type of silicone implant that's firmer than the traditional silicone implant so it may better mimic a natural tear drop breast shape in some women. Due to its firmness, this implant is less likely to show visible "wrinkling" of the implant in the upper chest. It maintains its shape even if the implant shell breaks.

### HOW LONG DO IMPLANTS LAST?

Implants generally need to be replaced every 10 to 15 years because their outer shells harden, leak or break. If you're not having problems with the implant, it does not need to be replaced.

### ARE IMPLANTS SAFE?

Yes. Extensive medical studies have established that both silicone and saline implants are equally safe to use. There is no correlation with the use of silicone implants and the development of certain inflammatory diseases such as lupus, Rheumatoid arthritis, etc. Both saline and silicone implants have similar risks and complications.

### WHAT IF AN IMPLANT LEAKS OR BREAKS?

Both saline and silicone implants can rupture and leak due to normal wear and tear. The current silicone implants have highly cohesive silicone inside with the consistency of a gelatin and the risk for silicone moving outside the breast pocket is very low when compared to the original implants with liquid silicone.

With silicone implants, it's usually not possible to tell if the implant breaks because the silicone remains in place and does not deflate. On the other hand, saline implants deflate and the water is absorbed by the body when the outer shell breaks. There are many different ways to look for implant ruptures including physical examination, mammogram, ultrasound and MRI.

**WHAT'S INVOLVED IN IMPLANT RECONSTRUCTION?**

Implant reconstruction can be done as an immediate procedure or as a delayed procedure. Sometimes, implants can be placed in just one step; sometimes, the process involves two or more steps.

Implant reconstruction usually begins with the placement of a tissue expander underneath the skin and muscles of the chest wall. During the next few weeks or months, you will come into the office to have the expander slowly filled with saline. This process stretches the skin and muscle in order to create a “pocket” for a permanent implant. The timing for the expansion procedure varies, but it's usually repeated every few weeks until the “pocket” is the appropriate size.

About 2 to 4 months after the expansion process is complete, the tissue expander is removed and replaced with a permanent silicone gel or saline implant. There are many different sizes and shapes of implants. Your plastic surgeon will help you choose the permanent implants that are best for you. Sometimes during immediate reconstruction, you won't need to go through the tissue expander process. Your permanent implant can be placed right away.

Your surgeon might also use a process called “fat grafting” to increase the camouflage over the implant. Fat grafting can reduce rippling or wrinkling of the implant (which can be seen through the skin) and soften the transition between the implant and the chest wall. This area

can appear like a “dent” in the breast. The fat grafting process involves removing fat from another part of the body, cleaning it and then injecting it to fill a dent. This fat may not always survive. The transferred fat sometimes forms hard scar lumps or cysts. Sometimes dents can form in the fat donor site.

Recovery from implant placement usually takes about 1 to 4 weeks.

**WHAT ARE THE RISKS AND/OR POSSIBLE COMPLICATIONS?**

As with any surgery, there are risks and possible complications. Complications may ultimately change the type, timing and final look of a reconstructed breast. Complications may occur at any point in the reconstruction process and could prevent completing a reconstruction. Complications may delay critically needed chemotherapy or radiation therapies which can affect survival.

Surgical complications may include:

- Infection
- Seroma (fluid collection)
- Skin necrosis (skin death)
- Bleeding
- Anesthesia risks

Implant complications may include:

- Capsular contracture
- Wrinkling/rippling
- Rupture
- Malposition
- Erosion/exposure

Some of these complications may require further surgery to remove or replace your

implant. Your plastic surgeon will review these risks during your office visits and answer any questions.

**Infection**

The risk of infection is usually higher with implant placement during immediate reconstruction than with delayed reconstruction. Unfortunately, some implants that get infected have to be removed and the body needs time to fight off the infection. Sometimes, it's possible to “salvage” an implant after infection. Salvage efforts include antibiotics or possibly having surgery in order to wash out the pocket and place a new implant or use another reconstruction technique after some time has passed.

**Seroma**

A seroma is a collection of fluid around an implant. Seromas occur at a higher rate when acellular dermal matrix (donated, cleaned skin tissue) is used. A seroma may, on rare occasions, cause pain and/or discomfort and require prolonged drainage with needle aspiration or drain tubes. An infected seroma may cause the potential loss of the implant.

**Skin necrosis**

Poor skin circulation over the implant can cause skin necrosis (skin death). The risk for this complication is higher with immediate reconstruction and in patients who have undergone previous radiation treatments or have a history of smoking or prior breast surgery. Skin death will increase the risk for infection and possible loss of the implant. This complication

usually requires another surgery to remove the affected dead skin. The amount of skin remaining will determine if implant reconstruction is still possible.

**Bleeding**

Bleeding may develop after any surgery and may require an urgent return to the operating room. If enough bleeding occurs, blood transfusions may be necessary to keep the patient's blood pressure normal. Significant bleeding can lead to a hard, tense breast and may even cause circulation problems leading to skin necrosis (skin death). Necrosis usually requires an urgent return to the operating room to prevent skin loss.

**Anesthesia risks**

All surgery carries some risk including heart attack, stroke, deep vein thrombosis (blood clots in the legs), pulmonary embolism (blood clots in the lungs), allergic reactions to medications, death and others. These risks are variable and increase with age, chronic medical problems (obesity, diabetes, hypertension, peripheral vascular disease, etc.) and smoking.

**Capsular contracture**

Capsular contracture may occur when the scar tissue that forms around all implants gets thick, hard and compresses the implant. This can cause changes in the way the implant looks and feels.

All implants may develop capsular contracture over time. There is a higher risk of this complication with immediate reconstructions and after radiation therapy.

Covering the implant with autologous tissue (your own tissue), especially following radiation, gives the best chance at reducing the risk for this complication. Severe capsular contractures will cause some discomfort and may make the implants look asymmetric and deformed. Treatment may involve removing the scar and replacing the implant. Changing from a smooth implant to a textured implant or from a round implant to a shaped implant may also help with this problem, but there is a higher likelihood of hardening occurring again as it is usually caused by your body's unique response to implants.

#### Wrinkling/rippling

Thin tissue covering the implant may cause the folds of the implant shell to be seen through the skin. This can be improved with many techniques including injecting fat or placing acellular dermal matrix (donated, cleaned skin tissue) over the implant. In addition, exchanging a soft implant that is more likely to wrinkle with a firmer implant (gummy bear) that is less likely to wrinkle may reduce this problem. In severe cases, doing autologous reconstruction with a flap will give more coverage to reduce visible wrinkling.

#### Rupture

Over time, an implant's silicone rubber shell can weaken and break from normal wear and tear. The current silicone implants have highly cohesive silicone inside with the consistency of a gelatin and the risk for silicone moving outside the breast pocket is very low when compared

to the original implants with liquid silicone. With silicone implants, patients can't tell when the implant breaks because the silicone remains in place and does not deflate. On the other hand, saline implants deflate when the outer shell breaks and the water is absorbed by the body. There are many different ways to look for implant ruptures including physical examination, mammogram, ultrasound and MRI.

#### Malposition

Implants may end up sitting in the wrong place (malposition). There is a higher risk of this complication during immediate reconstruction as compared to delayed reconstruction. Acellular dermal matrix (donated, cleaned skin tissue) may be used to help prevent this problem. Teardrop (not round) implants may also rotate, causing the breast shape to change and look unnatural. These complications usually require another surgery to correct.

#### Erosion/exposure

The tissue covering the implant may thin and possibly open to expose the implant. This may happen at any time. Thinning tissue can be augmented with placement of acellular dermal matrix (donated, cleaned skin tissue) or autologous tissue coverage. The risk for this complication is greater in breasts with infections, previous radiation therapy and in patients with thin skin and soft tissue cover.

## ABDOMINAL TISSUE BREAST RECONSTRUCTION

Tissue from your lower belly can be used to create a “new” breast mound.

Using your own tissue creates a breast that may look and feel more natural for your entire life. It changes as you change — unlike an implant.

You will need enough belly tissue — but not too much — to be a good candidate for

abdominal tissue reconstruction.

Most surgeons will want you to have a body mass index between 25 and 35 for this procedure.

Often, taking tissue from your belly makes it flatter and tighter, as if you had a tummy tuck.

**USING YOUR OWN TISSUE CREATES A BREAST  
THAT MAY LOOK AND FEEL MORE NATURAL FOR YOUR ENTIRE LIFE.  
IT CHANGES AS YOU CHANGE — UNLIKE AN IMPLANT.**



#### TIMING OF ABDOMINAL TISSUE BREAST RECONSTRUCTION

Most women have the option of starting abdominal tissue reconstruction **immediately** during a mastectomy surgery or it can be **delayed** for as long as you like.

Immediate abdominal tissue reconstruction is not recommended if you're likely to have radiation. Radiation can increase the risk of complications and damage a breast that's already been reconstructed.

**ABDOMINAL TISSUE BREAST RECONSTRUCTION**

**ADVANTAGES**

- No need for external prosthesis
- Breast is reconstructed from your own tissue, no implant is needed
- Belly may end up looking flatter, similar to having a “tummy tuck”
- Breast has more natural feel and look than with an implant
- No risk of rupture (as with implant)
- Once reconstruction is complete, no need for revision/replacement

**DISADVANTAGES**

- Surgery time and recovery longer than for other types of reconstruction
- Risk of complications higher than for other types of reconstruction
- Scarring on both abdomen and breast
- Potential donor site problems of muscle weakness, bulge, hernia, fluid collections, wound healing problems
- Possible tissue death requiring removal of tissue and starting over with another type of reconstruction

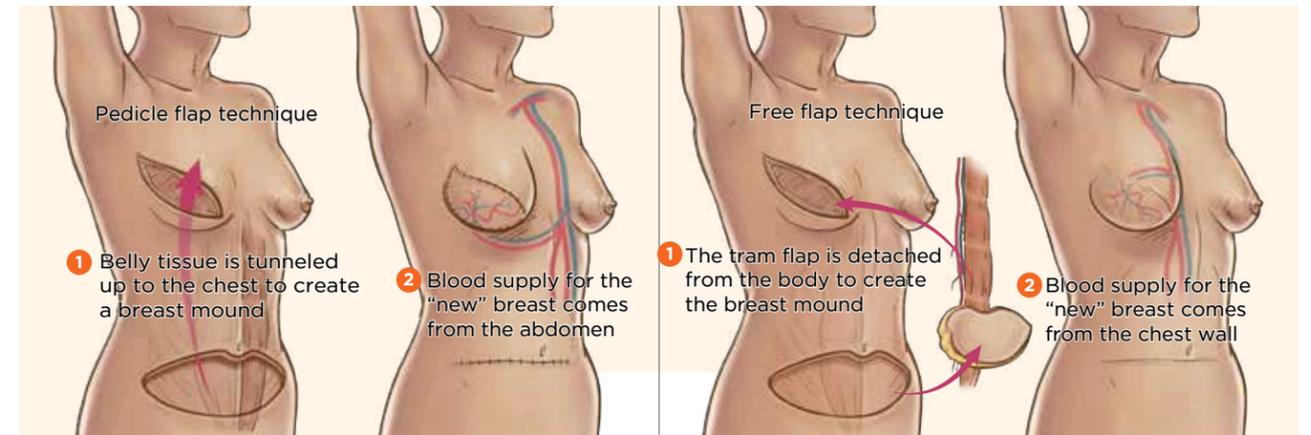
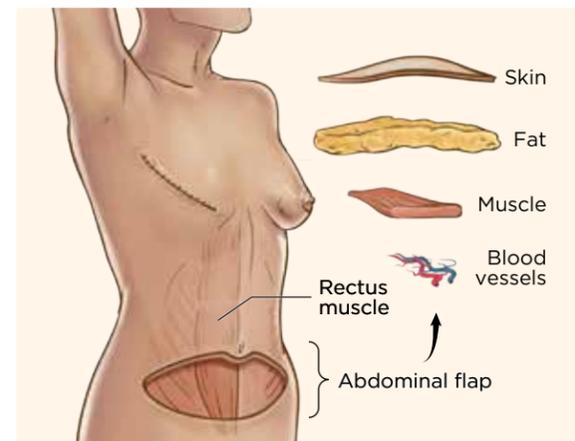
Delaying abdominal tissue reconstruction until after radiation is usually recommended.

**ABDOMINAL TISSUE BREAST RECONSTRUCTION PROCESS**

Abdominal tissue breast reconstruction is done with a football shaped “flap” of tissue taken from your abdomen below your belly button.

The flap includes skin, fat, blood vessels and, in some cases, all or part of your rectus muscle — otherwise known as your “six pack.” Your surgeon moves this flap to your chest wall and forms it into a breast shape.

The most common techniques used to create a “new” breast from abdominal tissue are the **pedicle flap** and the **free flap**.



**PEDICLE FLAP TECHNIQUE**

One type of pedicle flap technique is called a pedicle TRAM (Transverse Rectus Abdominis Myocutaneous) flap. This is the technique used most often if you’re having abdominal tissue reconstruction.

- Flap of skin, fat and the entire rectus muscle is taken from your abdomen.
- Flap is tunneled under your skin up to your chest. One end of the muscle and its blood supply are left attached to the abdomen like an “umbilical cord” to supply blood to your “new” breast.
- Flap is shaped into a “new” breast mound.
- Procedure usually takes 4-6 hours, and may require two surgeries.

**FREE FLAP TECHNIQUE**

Unlike the pedicle flap technique which leaves the flap attached to your body, the free flap completely removes the flap and “transplants” it to your chest.

- Flap of skin, fat, and sometimes a small portion of the rectus muscle is taken from your abdomen.
- Flap is completely detached from the abdomen and moved to the chest.
- Flap is shaped into a “new” breast mound.
- Abdominal blood vessels in the flap are reattached to the chest wall using microsurgery techniques (one or maybe two ribs may need to be removed).
- Procedure usually takes 6-12 hours.



### VARIATIONS ON FREE FLAP TECHNIQUE

- **Muscle sparing Free TRAM.** Only a small portion of the rectus muscle is moved to the chest, leaving most of it in the abdomen.
- **Free DIEP (deep inferior epigastric perforator).** No muscle is moved with the abdominal tissue to the chest, leaving the entire rectus muscle in the abdomen.



Immediate TRAM Reconstruction



Delayed TRAM Reconstruction

**UNLIKE IMPLANT RECONSTRUCTION, IN ABDOMINAL TISSUE RECONSTRUCTION THERE IS NO NEED FOR FUTURE SURGERIES TO REPLACE IMPLANTS WHEN THEY WEAR OUT.**

### RECOVERY

Recovery from abdominal tissue reconstruction can take longer than for other types of reconstruction. You can plan on a hospital stay of up to a week and about 4-8 weeks to get back to your normal activity without any complications.

### POSSIBLE COMPLICATIONS

The risk for complications is higher for abdominal tissue reconstruction than for other types of reconstruction.

- Abdominal weakness, bulge and hernia
  - The DIEP procedure — which does not remove muscle — reduces the risk of abdominal weakness, but doesn't entirely eliminate it.

- Infection
- Post-op bleeding
- Blood collection around donor site (hematoma)
- Fluid collection around donor site (seroma)
- Wound opening
- Formation of thick scars
- Pneumothorax (collapsed lung)
- Flap death (necrosis) caused by poor circulation to the transplanted tissue

Some of these complications may require further surgery or could result in the total loss of your reconstruction.

### IT'S GOOD TO KNOW

Abdominal tissue reconstruction is generally considered the most complicated type of breast reconstruction surgery. The surgery itself can take longer, meaning more time under anesthesia. Recovery can take longer as you heal from incisions in both your belly and breast. There is a greater risk of complications than with other techniques.

The good news is that once an abdominal tissue reconstruction is complete, you are done for life. Unlike implant reconstruction, there is no need for future surgeries to replace implants when they wear out. And you'll get a flatter tummy!

Ultimately, you and your doctor will decide if this procedure is right for you, based on your body type and your medical and surgical history. We want you to be happy with whatever procedure you choose.



**WHAT IS ABDOMINAL TISSUE RECONSTRUCTION?**

Abdominal tissue reconstruction is a surgical procedure to create a breast mound using a football shaped “flap” of tissue taken from your abdomen below your belly button. Your surgeon moves this flap to your chest wall and forms it into a breast shape. Abdominal tissue reconstruction can be done as an immediate procedure or as a delayed procedure.

**WHAT’S INVOLVED IN ABDOMINAL TISSUE RECONSTRUCTION?**

There are two commonly used techniques to perform this procedure. One is called the pedicle flap technique, the other is known as the free flap technique.

The pedicle TRAM (transverse rectus abdominus myocutaneous) flap is the most commonly used abdominal breast reconstruction technique. For this procedure, your surgeon takes skin, fat and the entire rectus muscle from your abdomen and tunnels it up to your chest. One end of the muscle and its blood supply are left attached to the abdomen like an “umbilical cord.” This becomes the blood supply for your “new” breast. This procedure usually takes about 4 to 6 hours to finish, but sometimes it requires two surgeries to complete the transfer.

The free TRAM flap procedure takes the same “football,” including the whole rectus muscle with its blood vessels, and completely detaches it from the abdomen. The surgeon then reattaches the abdominal blood vessels to the chest after removing one or maybe two ribs.

There are variations on both techniques. Your surgeon will help you choose the best option based on your body type and overall medical condition.

You can plan on a hospital stay up to a week after abdominal breast reconstruction surgery and about 4 to 8 weeks to get back to your normal activity without any complications.

**WILL THE SURGERY LEAVE A SCAR?**

Yes. Scars will form after all surgeries. Abdominal tissue reconstruction leaves two surgical sites and scars — one where the tissue was taken from the abdomen and one on the reconstructed breast. The visibility of scars on the abdomen and breast will vary depending on the genetics of the patient. Some scars grow thin and are difficult to see while others grow thick, raised and dark. Some patients may even form a keloid, which is a thick form of scarring more common in people with dark skin. The scar on the abdomen spans the entire abdomen from hip to hip. The scar on the breast is variable depending on when the reconstruction was started.

In immediate breast reconstruction, the scar may be around the old areola, which has been replaced by the abdominal skin. In delayed breast reconstruction, the abdominal skin shape is variable but usually is in the shape of a football.

**WHAT ARE THE RISKS AND/OR POSSIBLE COMPLICATIONS?**

The risk for complications is higher with abdominal tissue reconstruction and recovery takes longer than for implant or back tissue reconstruction.

As with any surgery, there are risks and possible complications. Complications may ultimately change the type, timing and final look of a reconstructed breast. Complications may occur at any point in the reconstruction process and could prevent completing a reconstruction

Complications may delay critically needed chemotherapy or radiation therapies which can affect patient survival.

Complications may include:

- Infection
- Seroma (fluid collection)
- Flap necrosis (flap death)
- Bleeding
- Abdominal hernia
- Wound opening
- Pneumothorax (collapsed lung)
- Skin patches
- Anesthesia risks

Some of these complications may require further surgery. Your plastic surgeon will review these risks during your office visits and answer any questions.

**Infection**

Infection may occur anywhere there is an incision. Treatment usually involves antibiotics and possible drainage of the infection. If a seroma becomes infected, surgery is usually required to remove infected fluid. Infections increase the risk for hernia formation at the abdominal donor site.

**Seroma**

A seroma is a collection of fluid in the space where the abdominal tissue was removed (donor site). The risk is increased in severely obese patients. Drains can reduce, but not eliminate, the risk of seroma. Drains are usually needed for 1 to 3 weeks.

**Flap necrosis**

Poor blood circulation to the skin or fat can cause flap necrosis (flap death). The risk is increased in severely obese patients. Fat necrosis is more common with pedicle flaps than free flaps and it may require further surgery to remove these portions of the flap or sometimes the entire flap. Performing a pedicle flap in two staged surgeries (delayed procedure) may reduce this risk. Problems with the connection of vessels in free flaps could cause loss of blood flow to the skin and fat resulting

in total loss of the reconstruction. This complication usually requires another surgery to remove the affected tissues and then using an alternate type of reconstruction.

### Bleeding

Bleeding may develop after any surgery and require an urgent return to the operating room. If enough bleeding occurs, blood transfusions may be necessary to keep the patient's blood pressure normal. Sometimes, a smaller amount of bleeding occurs to form a blood collection called a hematoma. A hematoma in the abdomen may require another surgery to remove the old blood. A hematoma in the breast may cause circulation problems with the flap resulting in tissue necrosis (tissue death). This usually requires an urgent return to the operating room.

### Hernia

After using abdominal tissue for breast reconstruction, intra-abdominal fat or intestines could bulge through an abdominal wall tear. This risk is increased for patients with a higher BMI or when the entire rectus abdominus muscle is used during pedicle or free TRAMs. Hernias may require multiple surgeries to correct. Sometimes, abdominal wall weakness occurs instead of a hernia. This may lead to the formation of an abdominal bulge or lower back pain due to body core weakness. Placement of mesh can help reduce this risk but not eliminate it.

### Wound opening

Abdominal wounds may require months to completely heal. The abdominal incision may open, especially if a seroma, infection or both are present. This risk is increased in smokers, severely obese patients, women who've had prior abdominal surgeries, and after radiation. Sometimes the wound can be cleaned as a minor procedure and the wound reclosed.

### Pneumothorax (collapsed lung)

The lung may collapse during a free flap when the chest vessels are isolated. If the collapse is significant, a chest tube is placed and may stay for several days lengthening your hospital stay.

### Skin patches

Large patches of different color skin are often present after autologous breast reconstruction. This is especially the case with delayed reconstructions after radiation therapy. Quite often, large areas of damaged skin are replaced with normal skin from other parts of the body to allow for a better breast shape and reduce healing complications.

### Anesthesia risks

All surgery carries some risk including heart attack, stroke, deep vein thrombosis (blood clots in the legs), pulmonary embolism (blood clots in the lungs), allergic reactions to medications, death and others. These risks are variable and increase with age, chronic medical problems (obesity, diabetes, hypertension, peripheral vascular disease, etc.) and smoking.

## BACK TISSUE BREAST RECONSTRUCTION

Tissue from your back can be used to create a “new” breast mound. The tissue is transferred from the same side as your mastectomy.

Back tissue can be used alone or may be combined with an implant. An implant may be needed if there is not enough skin and fat on the back to fill out a reconstructed breast and make it similar to the size and shape of the opposite breast. For women with small breasts, the back tissue may be enough, so an implant isn't always needed.

Back tissue reconstruction may be a good option for women who have a body mass index that's too high to safely transfer abdominal tissue — that's usually a BMI greater than 35.

### TIMING OF BACK TISSUE BREAST RECONSTRUCTION

Most women have the option of starting back tissue reconstruction **immediately** during mastectomy surgery or it can be **delayed** for as long as you like.

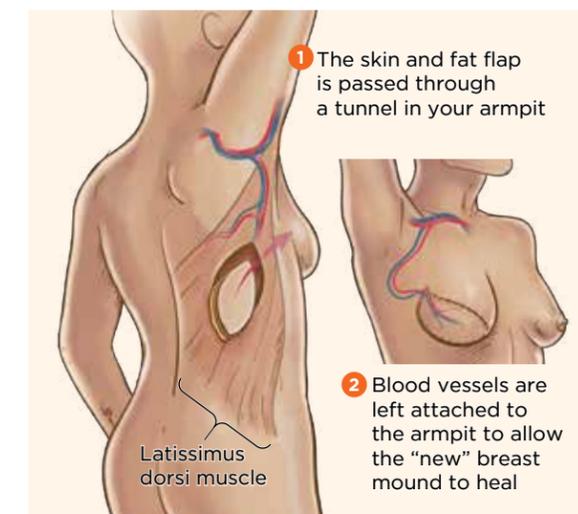
Immediate back tissue reconstruction is not recommended if you're likely to have radiation. Radiation can increase the risk of

complications and damage a breast that's already been reconstructed. Delaying back tissue reconstruction until after radiation is usually recommended.

### BACK TISSUE RECONSTRUCTION PROCESS (WITHOUT AN IMPLANT)

Back tissue reconstruction is done with a football shaped “flap” of tissue taken from the area below your shoulder blade.

The flap includes skin and fat attached to the Latissimus Dorsi muscle, the broadest muscle of the back, along with the blood



vessels that run within and under the muscle to the armpit.

Your surgeon rotates the flap from your back to the chest through a tunnel in your armpit. The blood vessels are left attached to the armpit and act like an “umbilical cord” to keep the tissue alive while it heals.

**BACK TISSUE RECONSTRUCTION PROCESS (WITH AN IMPLANT)**

Sometimes, with back tissue reconstruction, there is not enough back skin and fat to fill out a breast. In that case, your surgeon may use a saline or silicone implant to supplement your own tissue. A tissue expander may be used to create a

“pocket” for the implant. If there is enough skin and fat on your breast to cover an implant, the tissue expander may not be needed and the implant can be placed immediately.

Implant reconstruction with a tissue expander:

- **Placing a temporary tissue expander:** A hard, shaped, temporary tissue expander is placed beneath the flap transferred from your back. Sometimes, your surgeon may also use acellular dermal matrix (cleaned and processed skin) to cover the expander or keep it in the right place. The more tissue that covers your implant, the better the result.

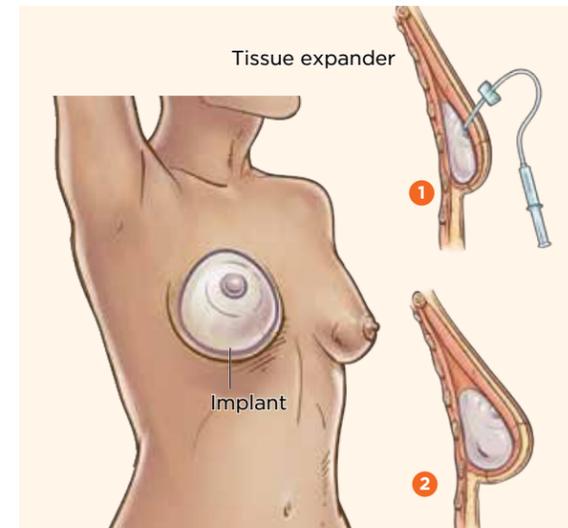
**BACK TISSUE BREAST RECONSTRUCTION**

**ADVANTAGES**

- No need for external prosthesis
- Breast is reconstructed from your own tissue with or without an implant
- Breast has more natural feel and look than with implant alone
- Shorter recovery than for abdominal tissue reconstruction

**DISADVANTAGES**

- Scarring on both back and breast
- Likely requires use of tissue expander and implant
- Possible tissue death requiring removal of tissue and starting over with another type of reconstruction
- Longer recovery than for implant reconstruction
- Potential back donor site problems including shoulder muscle weakness, scarring, infection, fluid collections, arm swelling and wound healing problems



- **Stretching the skin:** During the next few weeks or months, the tissue expander is slowly filled with saline to stretch the skin and muscle to create a “pocket” for the soft implant. This is usually repeated every few weeks during an office visit.
- **Placing a permanent implant:** About 2-4 months after the expansion process is complete, the tissue expander is removed and replaced with a permanent implant. This usually completes breast mound reconstruction.

**RECOVERY**

Usually, it takes less time to recover from back tissue reconstruction than from abdominal tissue reconstruction, but more time than using an implant alone.

You can plan on a hospital stay of 1-2 days and 2-6 weeks to get back to your normal activity.

**POSSIBLE COMPLICATIONS**

- Minor shoulder weakness
- Lymphedema (swelling) of the arm
- Infection
- Post-op bleeding
- Blood pooling under skin (hematoma)
- Fluid pooling under skin (seroma)
- Wound opening
- Flap death (necrosis) caused by poor circulation to the transplanted tissue

Possible complications if an implant is used:

- Infection
- Skin death (necrosis) caused by poor circulation over the implant
- Pooling of blood within breast pocket (hematoma)
- Pooling of fluid within breast pocket (seroma)
- Excessive scar formation on the implant, causing the implant to feel hard or contract
- Implant wrinkling (implant wrinkles can be seen through the skin)
- Implant rupture



- If a saline implant leaks or ruptures, the implant will collapse. The leaking saline is absorbed and naturally expelled by the body.
- If a silicone implant leaks or ruptures, the implant will not collapse. The gel may remain within the implant shell, or may escape into the breast implant pocket or surrounding tissues.
- Implant shifts in position or ends up sitting in the wrong place
- Implant erosion and exposure (the tissue covering the implant may thin and possibly open)



with abdominal tissue reconstruction. So, if you are trying to avoid using an implant, abdominal tissue reconstruction may be a

**BACK TISSUE BREAST RECONSTRUCTION MAY REQUIRE USE OF AN IMPLANT TO FILL OUT YOUR “NEW” BREAST.**

Some of these complications may require further surgery or could result in the total loss of your reconstruction.

**IT’S GOOD TO KNOW**

Using back tissue for reconstruction often requires an implant which is not needed

better option unless you have very small breasts and won’t need an implant.

Ultimately, you and your doctor will decide if this procedure is right for you, based on your body type and your medical history. We want you to be happy with whatever procedure you choose.

**WHAT IS BACK TISSUE RECONSTRUCTION?**

Back tissue reconstruction is a surgical procedure to create a breast mound using a football shaped “flap” of tissue transferred to your chest from the area below your shoulder blade. Back tissue reconstruction can be done as an immediate procedure or as a delayed procedure.

**WHAT’S INVOLVED IN BACK TISSUE RECONSTRUCTION?**

To perform back tissue reconstruction, your surgeon rotates the football-shaped flap from your back to the chest through a tunnel in your armpit. The blood vessels are left attached to the armpit and act like an “umbilical cord” to keep the tissue alive while it heals. If more breast volume is needed, your surgeon may place a tissue expander beneath the flap.

An implant is often used in conjunction with back tissue, especially when there is not enough skin and fat on the back to fill out a reconstructed breast and make it similar to the size and shape of the opposite breast. For women with small breasts, the back tissue may be enough, so the implant isn’t always needed.

Usually, it takes less time to recover from back tissue reconstruction than from

abdominal tissue reconstruction, but more time than using implants alone. You can plan on a hospital stay of about 1 to 2 days and 2 to 6 weeks to get back to your normal activity.

**WILL THE SURGERY LEAVE A SCAR?**

Yes. Scars will form after all surgeries. Back tissue reconstruction leaves two surgical sites and scars — one where the tissue was taken from the back and one on the reconstructed breast.

The visibility of scars on the back and breast will vary depending on the genetics of the patient. Some scars grow thin and are difficult to see while others grow thick, raised and dark. Some patients may even form a keloid, which is a thick form of scarring more common in people with dark skin. The scar on the back spans the entire side of the back. The scar may run vertically, horizontally or diagonally depending on way the skin is oriented on the muscle. The scar on the breast is variable depending on when the reconstruction was started. In immediate breast reconstruction, the scar may be around the old areola which has been replaced by the back skin. In delayed reconstruction, the shape varies but usually is in the shape of a football and placed on the central or lower half of the breast.

**WHAT ARE THE RISKS AND/OR POSSIBLE COMPLICATIONS?**

As with any surgery, there are risks and possible complications. Complications may ultimately change the type, timing and final look of a reconstructed breast. Complications may occur at any point in the reconstruction process and could prevent completing a reconstruction. Complications may delay critically needed chemotherapy or radiation therapies which can affect patient survival.

Surgical complications may include:

- Infection
- Seroma (fluid collection)
- Flap necrosis (flap death)
- Bleeding
- Wound opening
- Shoulder weakness
- Lymphedema
- Skin patches
- Anesthesia risks

Some of these complications may require further surgery. Your plastic surgeon will review these risks during your office visits and answer any questions.

**Infection**

Infection may occur at both the back and breast surgical sites. Treatment usually involves antibiotics and possibly surgery to wash out and replace an implant, if used. If an implant is present that can harbor bacteria, it may need to be removed if the infection fails to clear. If a seroma becomes infected, surgery is usually required to remove infected fluid.

**Seroma**

A seroma is a collection of fluid in the space between the skin and the muscle layer in the back (donor site) or around the implant pocket in the breast. Drains can reduce, but not eliminate, the risk of seroma. Drains are usually needed for 1 to 3 weeks.

**Flap necrosis**

Poor blood circulation to the skin, fat or muscle can cause partial or complete flap death (flap necrosis). This may be caused by certain medical problems, previous surgery that damages vessels or damage to vessels during the transfer to the chest. Tissue loss increases the risk for infection and possible implant loss. This complication usually requires another surgery to remove the affected skin. The amount of skin remaining will determine if back tissue reconstruction is still possible.

**Bleeding**

Bleeding may develop after any surgery and require an urgent return to the operating room. If enough bleeding occurs, blood transfusions may be necessary to keep the patient's blood pressure normal. Sometimes, a smaller amount of bleeding occurs to form a blood collection called a hematoma. A hematoma in the back may require another surgery to remove the old blood. A hematoma in the breast may cause circulation problems with the flap, resulting in tissue necrosis or an increased risk of capsular contracture around an implant. This usually requires an urgent return to the operating room.

**Wound opening**

Wounds may require months to completely heal and may open, especially if a seroma, infection or both are present. This risk is increased in smokers, obese patients and after radiation. Sometimes the wound can be cleaned as a minor procedure and the wound re-closed.

**Shoulder weakness**

Shoulder weakness may occur on the side from which the back (latissimus dorsi) muscle is transferred. Studies show about a 7% decrease in strength but the loss is usually noticed only by very athletic women.

**Lymphedema**

Same side arm swelling (lymphedema) may start or worsen, if already present, when lymphatic damage occurs during the tunneling of the flap through the armpit. If this happens, permanent use of an arm compression device may be necessary. The risk for infection of the arm is increased.

**Skin patches**

Large patches of different color skin are often present after autologous breast reconstruction. This is especially the case with delayed reconstructions after radiation therapy. Quite often, large areas of damaged skin are replaced with normal skin from other parts of the body to allow for a better breast shape and reduce healing complications.

**Anesthesia risks**

All surgery carries some risk including heart attack, stroke, deep vein thrombosis (blood clots in the legs), pulmonary embolism (blood clots in the lungs), allergic reactions to medications, death and others. These risks are variable and increase with age, chronic medical problems (obesity, diabetes, hypertension, peripheral vascular disease, etc.) and smoking.

## NIPPLE AND AREOLA RECONSTRUCTION



Usually, your reconstructed breast mound will not have a nipple and areola. Your surgeon can create a nipple and

look, helps hide mastectomy scars and can help your “new” breast look as much like your opposite breast as possible.

### TIMING OF NIPPLE AND AREOLA RECONSTRUCTION

Typically, nipple and areola reconstruction are done after your new breast mound has had time to heal and settle into place, which is usually about 2-4 months.

Your nipple and areola can be reconstructed at the same time or in separate procedures.

**MANY WOMEN THINK OF NIPPLE AND AREOLA RECONSTRUCTION AS THE “FINISHING TOUCH.”**

areola for you as the last step in your breast reconstruction — many women think of this procedure as the “finishing touch.”

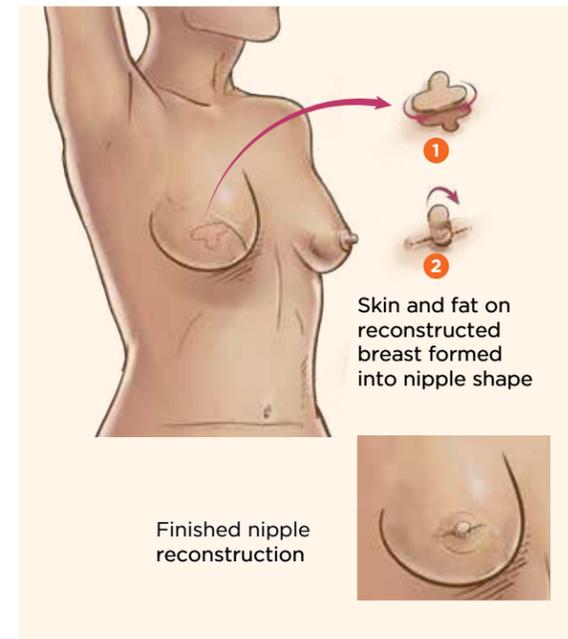
Recreating the nipple and areola gives your reconstructed breast a more natural



Before Nipple/Areola Reconstruction



After Nipple/Areola Reconstruction



### OPTIONS FOR NIPPLE AND AREOLA RECONSTRUCTION

Surgical reconstruction of your nipple and areola is typically done as an outpatient procedure with local anesthesia. There are several ways your surgeon can create a nipple and areola:

- Skin and fat on the reconstructed breast can be formed into a nipple shape. A nipple created with this method may lose its projection over time and tend to flatten out. Taking tissue from the breast mound may slightly change its size and shape.
- A portion of the opposite breast nipple can be used to create a new nipple. A grafted nipple does not tend to shrink or flatten. Grafted tissue may not survive and have to be removed.

- An areola skin graft can be taken from another part of your body. Skin grafts generally don't fade over time but may change color or develop scars. Tissue may not survive the grafting process and have to be removed. Problems at the donor site may include scarring, wound opening and infection.
- Areola tattooing recreates the “look” of a nipple and areola, but has no texture or dimension. Tattoos tend to fade over time and may need “touching up.” Tattoos may be a good option if it's not possible to surgically reconstruct a nipple because of scarring or poor tissue quality.



Areola Skin Graft



Areola Tattooing

### RECOVERY

It usually takes less time to recover from nipple/areola reconstruction than from any other step of the reconstruction process. There's typically less post-op pain.

**POSSIBLE COMPLICATIONS**

Usually, there are fewer complications from nipple/areola reconstruction than with other reconstructive steps:

- Infection
- Nipple death caused by poor circulation
- Malposition (a nipple in the wrong position must be surgically relocated or removed, although this is not always possible)
- Scarring
- Nipple flattening

**IT'S GOOD TO KNOW**

By the time you get to the point of thinking about nipple and areola reconstruction, you've already made quite a journey. How you finish that journey is up to you.



Just remember that a reconstructed breast will never look like a natural breast, even with a nipple and areola. The nipple and areola will not respond to stimulation or have normal function.

The extent of your reconstruction depends on what you want and are willing to accept. The important thing is that you feel comfortable with your choice and are satisfied with the results.

**WILL A RECONSTRUCTED BREAST MOUND HAVE A NIPPLE AND AREOLA?**

A reconstructed breast mound will usually not have a nipple and areola. They can be added in a separate procedure or procedures.

**WHEN IS NIPPLE AND AREOLA RECONSTRUCTION DONE?**

A nipple and areola are typically created after breast mound reconstruction is complete. This is often the last step in your breast reconstruction and many women think adding a nipple and areola as the “finishing touch.”

Usually, the process starts after your new breast has had time to heal, which is usually about 2 to 4 months. Your nipple and areola can be reconstructed at the same time or in separate procedures.

**WHAT'S INVOLVED IN NIPPLE AND AREOLA RECONSTRUCTION?**

There are several ways your surgeon can create a nipple and areola. The most common way to reconstruct the nipple is to take a bit of skin and fat on the reconstructed breast and form it into a nipple shape. Taking tissue from the breast mound may slightly change the mound's shape and size. The nipple may also lose its projection over time and tend to flatten out.

Another technique uses a portion of your opposite breast nipple to create a new nipple on the breast mound. This type of nipple does not tend to shrink or flatten out. Sometimes, the grafted tissue does not survive and has to be removed. In that case, your surgeon may use another form of nipple reconstruction.

Your areola may be reconstructed using skin taken from another part of your body. Skin grafts generally don't fade over time but may change color or develop scars. Some or all of the tissue may not survive the grafting process and have to be removed. Problems at the donor site may include scarring, wound opening and infection.

Tattooing can also be used to reconstruct your areola, nipple or both. This is a relatively fast and easy way to recreate the “look” of a nipple and areola, but there is no texture or dimension to this technique and it may appear painted on. Many times, a surgeon will use different shades of color to make the flat tattoo look more 3-dimensional. Tattooing will tend to fade over time and may need “touching up” in the future.

Nipple and areola reconstruction are typically done as outpatient procedures with local anesthesia. The recovery period is usually the shortest of all the breast reconstruction procedures you'll have.

There's typically less post-op pain and fewer complications.

## NIPPLE-SPARING BREAST RECONSTRUCTION

Nipple-sparing reconstruction is a special type of mastectomy that removes just the breast tissue and leaves behind the entire breast skin, nipple and areola.

This procedure is usually reserved for women who are having a mastectomy as a preventive measure (prophylactic mastectomy) or who have early stage tumors that are far away from the nipple.

A major advantage of this procedure is that your breast will look very similar to the way it did before your mastectomy and you don't need to reconstruct the nipple

### NIPPLE-SPARING BREAST RECONSTRUCTION PROCESS

For this procedure, your mastectomy and reconstruction are done at the same time.

- Surgeon makes an incision either along the side of your breast or near the areola
- Maximum amount of breast tissue removed
- Tissue removal leaves an “envelope” that your plastic surgeon fills with:
  - Tissue expander and/or implant
  - Tissue from your belly or back

**NIPPLE-SPARING BREAST RECONSTRUCTION  
MAY BE AN OPTION FOR WOMEN WITH A VERY EARLY STAGE TUMOR  
THAT IS FAR AWAY FROM THE NIPPLE.**

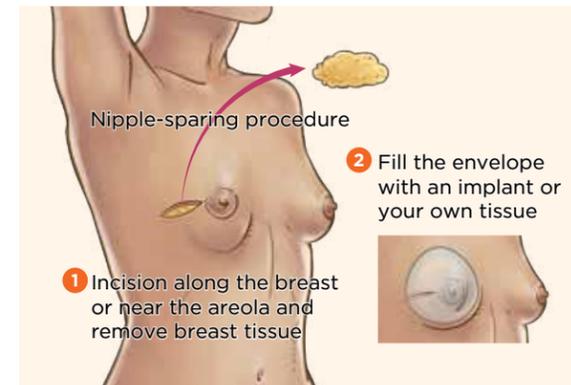
and areola. Your nipple remains intact, but may lose some sensation, color and projection. You will likely only have a scar near the areola or in the crease under your breast or out toward your arm.



Nipple Sparing  
Reconstruction with  
Peri-areola Incision



Nipple Sparing  
Reconstruction with  
Lateral Breast Incision



### GOOD CANDIDATES FOR NIPPLE- SPARING BREAST RECONSTRUCTION

Nipple-sparing reconstruction is usually only offered to women who:

- Have a preventive mastectomy
- Have small breasts that do not sag
- Have a relatively small, non-aggressive tumor that is not near the nipple
- Do not smoke

Your cancer surgeon can tell you if you are a candidate for this technique.

### RECOVERY

Your recovery time depends on the technique used to reconstruct your breast mound.

Typically, it takes 2-6 weeks to recover from implant placement; 4-6 weeks for abdominal tissue reconstruction; and 2-6 weeks for back tissue reconstruction.

### POSSIBLE COMPLICATIONS

All the same risks that apply to the implant and autologous breast reconstruction

procedures apply to the nipple-sparing technique. (Please see the chapters for each procedure.)

This procedure, like all immediate reconstructions, carries a higher risk for infection and skin death. There's also the additional risk of nipple and areola death and the loss of nipple sensation and pigmentation.

In the most extreme cases, the nipple and areola may not survive this procedure and need to be removed.

### IT'S GOOD TO KNOW

A small tumor away from the nipple is a requirement for having the nipple-sparing procedure. Women with large, aggressive tumors and large droopy breasts will be best served with another type of reconstruction.

Although this procedure may leave you with a more natural-looking breast, our first priority is always your health and survival, and that comes before any cosmetic considerations. Your doctor will help you decide if nipple-sparing reconstruction is right for you.



**WHAT IS NIPPLE-SPARING RECONSTRUCTION?**

Nipple-sparing reconstruction is a special type of mastectomy that removes just the breast tissue and leaves behind the entire breast skin, nipple and areola. This procedure is usually reserved for women who are having a mastectomy as a preventive measure or who have early stage tumors that are far away from the nipple. You will need to discuss with your cancer surgeon if you are a candidate for this type of reconstruction.

**IS THERE A RISK OF CANCER RECURRENCE IN NIPPLE-SPARING RECONSTRUCTION?**

Historically, surgeons removed the nipple and areola to eliminate the ductal tissue within the nipple in order to reduce cancer risks. Many breast cancers originate in the cells that line the ducts. Therefore, women who have a nipple-sparing procedure knowingly leave behind ductal tissue in their breast. There are no long term studies that show how this technique affects survival or cancer recurrence.

**OPPOSITE BREAST RECONSTRUCTION**

Chances are, after you've had reconstruction on one breast, the differences between your "new" breast and your "old" breast can be very obvious.

You can certainly live with the differences in size and shape, but you don't have to.

You may choose to have a surgical "adjustment" on your opposite breast to make it look more like your reconstructed breast. Your breasts will never be exactly the same — but they'll be closer than they were.

**TIMING OF OPPOSITE BREAST RECONSTRUCTION**

Opposite breast reconstruction is often performed during the second surgery in the reconstruction process. This could be at the point when:



Before Surgery for Symmetry



After Surgery for Symmetry



- Your temporary tissue expander is replaced with a permanent implant or
- During an adjustment to your initial breast mound reconstruction

**OPTIONS FOR OPPOSITE BREAST RECONSTRUCTION**

Your doctor has several ways to get your "old" breast to look more like your perkier "new" breast. All are usually done as outpatient procedures.

**Breast lift**

- Opposite breast can be lifted to attain a closer match
- Breast size usually doesn't change, but the shape can change dramatically

**Breast reduction**

- Excess skin and breast tissue can be removed to create a smaller opposite breast and a closer match

**Breast augmentation with an implant**

- On the rare occasions when a breast lift or reduction don't achieve symmetry, your surgeon may use an implant on your opposite breast. An implant in the opposite breast is only for symmetry and not for breast enlargement — that's a cosmetic procedure, and not considered part of the reconstructive process.
- Implant will probably need to be replaced every 10-15 years

**HAVING A MAMMOGRAM WITH AN IMPLANT**

Although implants are safe, they can block the view of a tumor on a mammogram. To meet this challenge, we use a special mammography technique to move the implant out of the way to get a clear view of the breast tissue. Even so, there's still a risk for missing some cancers, especially in the early stages.

**RECOVERY**

It's generally easier to recover from opposite breast reconstruction than from your first surgery for breast mound reconstruction. You're likely to have less

**IF NEEDED, YOU CAN HAVE  
A SURGICAL "ADJUSTMENT" ON YOUR OPPOSITE BREAST  
TO ACHIEVE BETTER SYMMETRY.**



post-op pain and a quicker return to normal activity.

The average recovery time is usually 2-4 weeks, although complications can make recovery take longer.

Immediate post-op bruising, swelling and scar formation can initially make your breasts differ in size and shape. But usually after 3 months of healing, your breasts will "settle" and you and your surgeon can see if any other procedures are necessary to make your breasts more alike.

**POSSIBLE COMPLICATIONS**

- Infection
- Post-op bleeding
- Wound opening
- Fluid collection (seroma)
- Skin or nipple death caused by poor circulation
- Malposition (a nipple in the wrong position must be surgically relocated or removed, although this is not always possible)
- Loss of nipple sensation
- Scarring
- Nipple flattening

Some of these complications may require further surgery or could result in the total loss of your reconstruction.

**IT'S GOOD TO KNOW**

Although an adjustment to your opposite breast can help achieve symmetry, your breasts will never be exactly the same — even natural breasts are never identical.



Often, we can gain symmetry with a breast lift or reduction alone, but other times we may need a little extra help from an implant. Even with a breast lift or reduction, you can expect some sagging to come back, especially with larger breasts. Unfortunately, gravity always wins.

We'll guide you in making a decision that will help you achieve the goals you want. We want you to be happy with both of your breasts as you get on with your life after your mastectomy.

**WHAT IS OPPOSITE BREAST RECONSTRUCTION?**

Sometimes, a reconstructed breast does not match the opposite breast. Getting the reconstructed breast and the opposite breast to look alike is difficult unless surgery is also performed on the natural breast.

**WHAT'S INVOLVED IN OPPOSITE BREAST RECONSTRUCTION?**

An opposite breast adjustment usually involves either a breast lift, breast reduction, or breast augmentation with an implant. This adjustment procedure is often done 3 to 6 months after the first surgery in the reconstruction process, to make sure the reconstructed breast has had time to heal and settle into its final size and shape.

Opposite breast reconstruction is usually done at the same time as the second surgery in the reconstruction process, either when a tissue expander is replaced with an implant or when adjustments are made to an autologous breast reconstruction.

Even with these adjustment procedures, your breasts will never be exactly the same — but they'll be closer than they were.

**WILL THE SURGERY LEAVE A SCAR?**

Yes. Scars will form after all surgeries. The visibility of scars will vary depending on the genetics of the patient. Some scars grow thin and are difficult to see while others grow thick, raised and dark. Some patients may even form a keloid, which is a thick form of scarring more common in people with dark skin.

Scars may travel completely around the nipple (donut), or around the nipple and straight down to the crease (lollipop), or completely around the nipple and straight down to the crease and within the crease (anchor).

**DOES AN IMPLANT IN THE OPPOSITE BREAST AFFECT GETTING A MAMMOGRAM?**

Although implants are safe, they can interfere with the detection of breast cancer because they can block the view of a tumor on a mammogram. To meet this challenge, we use a special mammography technique to move the implant out of the way to get a clear view of the breast tissue. Even so, there's still a risk for missing some cancers, especially in the early stages.

**WHAT ARE THE RISKS AND/OR POSSIBLE COMPLICATIONS?**

As with any surgery, there are risks and possible complications.

- Infection
- Seroma (fluid collection)
- Tissue necrosis (tissue death)
- Nipple necrosis
- Nipple malposition
- Loss of nipple sensation
- Bleeding
- Wound opening
- Anesthesia risks

Some of these complications may require further surgery. Your plastic surgeon will review these risks during your office visits and answer any questions.

**Infection**

Infection may occur anywhere there is an incision. Treatment usually involves antibiotics and possible drainage of the infection. If a seroma becomes infected, surgery is usually required to remove infected fluid. If an implant was placed, there is risk for implant loss. Infections may also cause nipple necrosis (nipple death).

**Seroma**

A seroma is a collection of fluid in the breast. This may cause discomfort and pain resulting in prolonged drainage with needle aspiration or tube drains. A seroma increases the risk for infection and possible

implant loss, if present. Drains can reduce, but not eliminate, the risk of seroma. Drains are usually needed for 1 to 3 weeks.

**Tissue necrosis**

Poor circulation in the breast tissue may cause skin death (necrosis) or internal scarring that feels like hard lumps. This may cause worry of cancer recurrence or discomfort in a bra. Sometimes, this tissue has to be removed or biopsied.

**Nipple necrosis**

Poor blood circulation or damage to the nipple or surrounding skin during surgery can cause nipple and areola death. Tissue death increases the risk for infection and possible implant loss, if used. This complication usually requires another surgery to remove the affected skin. The amount of skin remaining will determine if the nipple needs to be removed and reconstructed. If circulation problems are detected during the operation, the nipple/areola may be removed and placed on the skin as a graft. This is called a free-nipple graft.

**Nipple malposition**

The nipple and areola can shift position so they do not match the position of the nipple and areola on the reconstructed breast. A nipple in the wrong position must be surgically relocated or removed, although this is not always possible.

**Loss of nipple sensation**

Adjustment procedures to the opposite breast may cut nerves to the nipple, creating permanent loss of nipple sensation.

**Bleeding**

Bleeding may develop and even require an urgent return to the operating room to prevent skin/nipple loss, scar formation and fluid formation. Larger amounts of bleeding may cause a larger blood collection which may result in circulation problems in the skin and possible necrosis. Blood around an implant may also increase the risk for capsular contracture.

**Wound opening**

Wounds may require months to completely heal and may open, especially if a seroma,

infection or both are present. A wound opening may require that an implant be removed, if used. The risk of wound opening is increased in smokers, obese patients and after radiation. Sometimes the wound can be cleaned as a minor procedure and the wound re-closed.

**Anesthesia risks**

All surgery carries some risk including heart attack, stroke, deep vein thrombosis (blood clots in the legs), pulmonary embolism (blood clots in the lungs), allergic reactions to medications, death and others. These risks are variable and increase with age, chronic medical problems (obesity, diabetes, hypertension, peripheral vascular disease, etc.) and smoking.

## EFFECTS OF RADIATION ON BREAST RECONSTRUCTION

Radiation is usually part of the treatment for *all* women who have a lumpectomy and may be required for *some* women after a mastectomy.

Radiation helps prevent local spread and recurrence of cancer in the breast and nearby lymph nodes — and we all agree that's a very good thing. The downside of radiation is that it increases the risk of complications and makes it more difficult to reconstruct a breast. Radiation can damage a breast that's already been reconstructed.

Often, a plastic surgeon will want you to complete radiation before you begin breast reconstruction.

### EFFECTS OF RADIATION ON SURGICAL HEALING

Radiation can damage the blood supply to the radiated area, and tissue needs good blood circulation to properly heal.

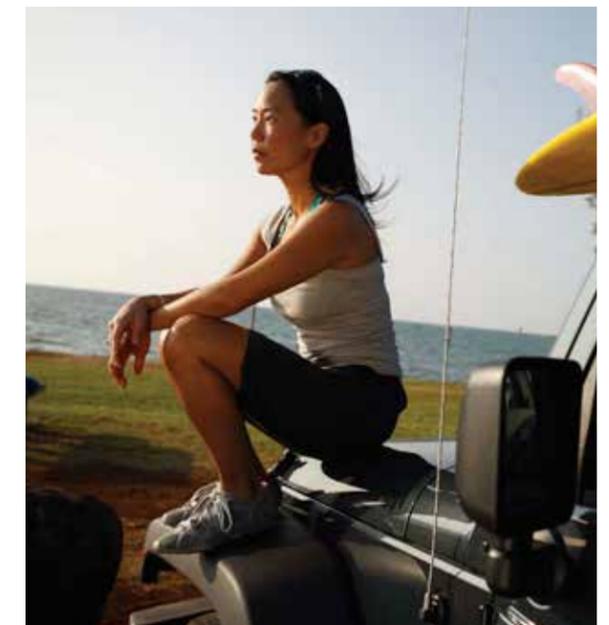
A surgical wound exposed to radiation may:

- Become infected
- Fail to heal
- Open

### EFFECTS OF RADIATION ON A BREAST RECONSTRUCTED WITH AUTOLOGOUS TISSUE

If you have autologous tissue reconstruction and then have radiation, your reconstructed breast may:

- Shrink
- Harden
- Lose elasticity
- Change color
- Tissue/fat death (necrosis)



**EFFECTS OF RADIATION ON A BREAST RECONSTRUCTED WITH AN IMPLANT**

Radiation is particularly hard on implants, whether radiation is given before or after the implant is placed.

The implant may:

- Shrink
- Harden
- Break through skin



Exposed Implant After Radiation



Capsular Contracture After Radiation

Holding off on reconstruction until you finish radiation:

- Helps you avoid problems with surgical healing
- Lowers the chance that the look, feel or size of your reconstructed breast will be harmed by radiation therapy

Delayed autologous tissue reconstruction (with or without an implant) is often recommended for women who need radiation.

**OFTEN, A PLASTIC SURGEON WILL WANT YOU TO COMPLETE RADIATION BEFORE YOU BEGIN BREAST RECONSTRUCTION.**

**IF YOU KNOW YOU WILL BE NEEDING RADIATION**

If you know you will need radiation, your surgeon will likely recommend that you have radiation first, then begin reconstruction. Many surgeons will not perform immediate reconstruction using autologous tissue due to the damage radiation can cause.

Delayed autologous reconstruction has the advantage of using tissue from your back or belly that has not been damaged by radiation. This healthy tissue, with its good blood supply, lessens the risk of infection and may actually aid in healing. Delayed reconstruction using soft, pliable tissue helps you achieve a more natural breast shape and reduce your risk for complications.

Skin exposed to radiation before delayed reconstruction may no longer be pliable enough to stretch over an implant.

**IF YOU HAVE RECONSTRUCTION, THEN LEARN YOU NEED RADIATION**

Sometimes the need for radiation isn't known until after you've had your mastectomy and the pathology report comes in.

If you have already begun the reconstruction process and then find you need radiation, your plastic surgeon may put reconstruction on hold until you've finished radiation. Just know that radiation — or any cancer therapy — always takes priority over reconstruction.

If you already have a tissue expander or implant in place, your surgeon may be able to decrease complications and improve your breast shape by covering the implant with tissue that has not been exposed to radiation or by using firmer, "gummy bear" implants.

In some cases, your surgeon may remove the implant and proceed with autologous tissue reconstruction.

**IT'S GOOD TO KNOW**

Although radiation complicates breast reconstruction, most women can still have successful breast reconstruction, even if radiation is part of their treatment plan. But your need for radiation might delay your plans for reconstruction and determine the type of reconstruction you have.

When it comes to reconstruction, it's always good to be flexible and willing to change course. We can't guarantee that



the road will be completely smooth — but we'll do our best to prevent complications and solve any problems that may arise. Your plastic surgeon will work around any radiation therapy you need.

**DOES THE NEED FOR CANCER TREATMENT SUCH AS RADIATION OR CHEMOTHERAPY AFFECT BREAST RECONSTRUCTION?**

Yes. The need for radiation or chemotherapy always takes priority over reconstruction. That means you will likely need to delay reconstruction until you've finished cancer treatment. You may also need to choose a reconstruction procedure that is compatible with changes to your skin or tissues that may be caused by your cancer treatment.

**WHAT IS THE PURPOSE OF RADIATION THERAPY?**

Radiation helps prevent cancer spread and recurrence "locally" when the cancer is found in the breast and axillary lymph nodes. Radiation therapy is necessary for all patients after lumpectomy and in some patients after mastectomy. Doctors use various factors to determine the need for radiation, including: tumor size, presence

of tumor in the lymph nodes, tumor aggressiveness and how close the tumor is to the surgical margins. A margin is the amount of normal tissue between the edge of a tumor and the edge of the removed breast tissue.

**HOW DOES THE NEED FOR RADIATION AFFECT RECONSTRUCTION?**

Radiation prevents cells from growing by causing cell death, scarring and decreased blood flow to the area. This creates a hostile environment for growing cells which is good for preventing cancer spread but bad for surgical healing.

All surgical risks are increased in an area that has been exposed to radiation. Tissues do not heal well after radiation. Sometimes incisions open up after surgeries due to poor circulation or infections. Some tissue may even have necrosis (death) after surgery due to this poor circulation. For these reasons, surgeons may want to delay

the start of reconstruction until months after radiation therapy is complete.

If you've already started reconstruction and then find you need radiation, your surgeon may delay completing your reconstruction until you've finished therapy. Even so, radiation may damage your reconstruction and affect your final cosmetic result.

Implant-only reconstruction can be severely affected by radiation, since the skin may no longer be pliable enough to stretch over an implant. If an implant is already in place, a surgeon may choose to cover it or replace it with your own tissue (such as from your back or belly) that has not been exposed to radiation. This lowers the complication risks by improving circulation and brings in soft pliable tissue which gives a more natural shape.

Radiation and the impact on implants is something that needs to be discussed carefully with your surgeon.

**WHAT IS THE PURPOSE OF CHEMOTHERAPY?**

Chemotherapy helps prevent cancer from spreading "globally" throughout the body.

**HOW DOES THE NEED FOR CHEMOTHERAPY AFFECT RECONSTRUCTION?**

Breast reconstruction surgeries cannot be performed during chemotherapy. Therefore, your reconstruction process is placed on hold until chemotherapy is completed.

## TALKING WITH YOUR PLASTIC SURGEON



If you decide to have breast reconstruction, or are still thinking about it, you'll want to talk with a plastic surgeon who will partner with you on the road ahead — whichever direction it may take.

You'll get the most out of your visit if you go in with realistic expectations about the reconstruction process and its results. Keep in mind:

- Breast reconstruction is a complex process that involves multiple surgeries, spread out over a year or so.
- A reconstructed breast will never look as natural as the breast Mother Nature gave you.

- You may start down one reconstruction pathway and then need to change course because of complications — and complications do happen.
- Cancer therapy may change the reconstruction pathway. Cancer therapy takes priority.

Go to your visit prepared to ask questions:

- Am I a good candidate for breast reconstruction?
- What type of breast reconstruction might be best for me?
- What's the best timing for my reconstruction? Immediate or delayed?
- What risks might I face?
- What results can I expect?

### IT'S GOOD TO KNOW

Just remember, breast reconstruction is not emergency surgery — you have time to think and to digest everything you may be going through right now. Your plastic surgeon will be ready to talk with you when you're ready.

Ask questions. Share your concerns. Make sure you understand all your options. We know that breast reconstruction is a big decision and we want you to feel comfortable with whatever you decide.

### WHAT QUESTIONS SHOULD I ASK MY PLASTIC SURGEON?

Your plastic surgeon will help you decide if you're a good candidate for breast reconstruction and, if so, the type of breast reconstruction that may be most appropriate for you. During your consultation, the surgeon will discuss your reconstructive options, including the risks and benefits for each procedure. You will also discuss the expected outcomes from reconstruction. Learning as much as you can about reconstruction before the first visit with your plastic surgeon will

prepare you to partner with your doctor in choosing the best way to proceed with breast reconstruction. Go to your first visit with some questions. Here's a start:

- Am I a good candidate for breast reconstruction?
- What type of breast reconstruction might be best for me?
- What's the best timing for my reconstruction?
- What risks do I face?
- What results can I expect?

## PARTIAL BREAST RECONSTRUCTION AFTER LUMPECTOMY

Unlike a mastectomy which removes your entire breast, a lumpectomy removes only the portion of your breast which contains the tumor.

Removing the tumor may leave you with a visible dent in your breast. Radiation can make a defect look even worse. Partial breast reconstruction may help repair or mask the damage to your breast shape caused by removing the tumor or by radiation.

Your reconstructed breast will never look exactly the same as it did, but our goal is to give you back some of what you've lost by making your "new" breast look as much like your "old" breast as possible.

### TIMING OF PARTIAL BREAST RECONSTRUCTION

Reconstruction can be performed **immediately** during the same surgery as



Left Breast With Flap Reconstruction



Breast Reduction Reconstruction



a lumpectomy or it can be **delayed** for several weeks until the margins are known to be clear or even longer, until after you've completed radiation.

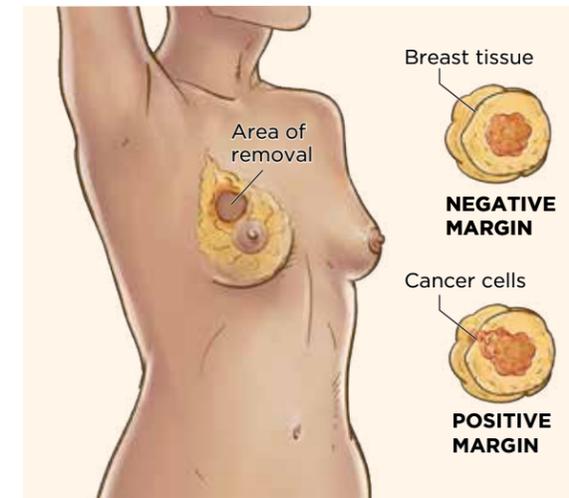
The margin is a rim of tissue surrounding your tumor. A pathologist will examine the margin and report the findings within 1-2 weeks after your surgery.

"Negative" or "clear" margin:

- No cancer cells found in margin
- Confirms cancer removal

"Positive" margin:

- Cancer cells found in margin
- More surgery or even a mastectomy is needed to get clear margins and confirm that the cancer has been completely removed.



### GOOD CANDIDATES FOR IMMEDIATE PARTIAL BREAST RECONSTRUCTION

You may be a good candidate for immediate reconstruction if:

- Your tumor is small
- Your tumor is in one area and there's very low risk of leaving any cancer behind

The downside of immediate reconstruction is that if the margin comes back "positive" it will be necessary to remove more tissue. It can be very difficult to locate the correct tissue because it's been rearranged during the initial lumpectomy. So, sometimes, a total mastectomy will be necessary.

### GOOD CANDIDATES FOR DELAYED PARTIAL BREAST RECONSTRUCTION

Your doctor may recommend that you delay reconstruction if:

- You have a larger tumor
- You have tumors in multiple areas with a higher risk of cancer being left behind

If the pathology report shows that some cancer still remains (that is, you have positive margins), you may need another surgery before you have reconstruction.

Your plastic surgeon will help you choose the best timing for your reconstruction — as well as the partial breast reconstruction technique that might work best for you.

### PARTIAL BREAST RECONSTRUCTION TECHNIQUES

There are a number of different ways to perform partial breast reconstruction.

#### Local tissue rearrangement

- Incision made completely around your nipple and areola
- Deep breast tissue rearranged to close the hole left by the lumpectomy
- Good technique for smaller defects
- Good technique if breast reduction not needed



**Breast reduction**

- Excess skin removed
- Deep breast tissue rearranged to fill in the holes left by the lumpectomy
- Good technique for women with large, droopy breasts who would like smaller breasts

**Fat grafting**

- Fat suctioned from one part of your body
- Fat injected into the defect or dent
- May take multiple fat injections to reduce the size of the defect

**Tissue flaps**

- Flap of tissue from your back or belly can fill larger defects
- More commonly used to repair defects after radiation therapy



You can certainly live with the differences in size and shape, but you don't have to.

You may choose to have a surgical "adjustment" on your opposite breast to make it look more like your reconstructed breast. Even with these adjustment procedures, your breasts will never be

exactly the same — but they'll be closer than they were.

Your surgical "adjustment" may involve a breast lift or reduction to your opposite breast. This is usually done 3-6 months after you've completed reconstruction and radiation on the breast with cancer. Please see the chapter on opposite breast reconstruction for more information about this procedure.

Please see the chapters on abdominal and back tissue reconstruction for more information about using your own tissue in rebuilding your breast.

**OPPOSITE BREAST SURGERY FOR SYMMETRY**

Chances are, after you've had partial reconstruction on one breast the differences between your "new" breast and your "old" breast may be very obvious.

**POSSIBLE COMPLICATIONS**

- Infection
- Post-op bleeding
- Blood pooling under the skin (hematoma)
- Fluid pooling under the skin (seroma)
- Delayed wound healing
- Nipple and areola death
- Fat death, which can result in painful lumps
- Breast disfigurement, particularly after radiation
- Breast asymmetry
- Finding of positive margins may lead to more surgery or a total mastectomy

We can't guarantee you won't have complications, but your plastic surgeon will take care of you and get you through them if they happen.

**IT'S GOOD TO KNOW**

Partial breast reconstruction is a path you may — or may not — want to follow after your lumpectomy. It all depends on what you want.



For some women, breast reconstruction helps them feel whole again. There are just as many women who don't want any more surgery and are perfectly happy with a few dents or breast asymmetry.

If you choose reconstruction, our goal is to make your breast look as much as possible like it did before your cancer surgery. It won't be perfect and you're likely to have some scarring, but you will get the best breast possible.

**PARTIAL BREAST RECONSTRUCTION CAN HELP RESTORE THE LOOK AND FEEL OF YOUR BREAST AFTER A LUMPECTOMY.**

**WHAT IS A LUMPECTOMY?**

A lumpectomy, sometimes called breast conservation therapy, is a surgical procedure to remove just the breast cancer tumor along with a rim of surrounding tissue called a “margin.” The rest of the breast is left alone. This technique is usually reserved for early stage breast cancers that are only in one area of the breast and not multifocal (multiple parts of the breast). This technique may also be used when a patient has received chemotherapy before any surgery, shrinking the tumor to a small size so that it can be completely removed without undergoing a mastectomy.

During or after a lumpectomy, a pathologist examines the tumor and the surrounding tissue to make sure there are no cancer cells in the margin. It can take 1 to 2 weeks after surgery to confirm complete removal of the cancer. If margins are “positive” (not clear), multiple surgeries may be required to clear the cancer from the breast. This form of therapy for invasive cancer is almost always followed by whole breast radiation therapy to reduce the risk of the cancer returning. Radiation therapy is sometimes not necessary for non-invasive cancers. As compared with mastectomy, lumpectomy surgery with radiation preserves more of the native breast while maintaining similar survival rates.

**HOW DOES A LUMPECTOMY AFFECT THE LOOK OF A BREAST?**

Although a lumpectomy preserves more normal breast tissue than a mastectomy, deformities may occur depending on the size of your breasts, where the cancer is located, and how much breast tissue needs to be removed to get rid of the cancer. Immediately after a lumpectomy your body fills in that hole with fluid so your breast looks like nothing was done to it except for a scar. However, radiation is necessary to reduce the chance of cancer coming back and improve survival rates. Unfortunately, radiation worsens lumpectomy deformities by shrinking the entire breast on average 10 to 20% causing the fluid pocket to collapse and pulling down surrounding tissues. This distorts the breast by leaving dents and/or pulling the nipple in awkward directions in addition to changing the skin color, and increasing breast tissue density, skin thickness and scarring.

**WHAT IS PARTIAL BREAST RECONSTRUCTION?**

Partial breast reconstruction is a surgical procedure to either close or fill in the hole left behind after the tumor and margin have been removed.

**WHEN IS PARTIAL BREAST RECONSTRUCTION DONE?**

Immediate reconstruction is performed at the same time as the lumpectomy. Immediate reconstruction is usually performed for localized breast cancer (one area) and not multifocal disease (more than one area) and when there is very low risk of leaving cancer behind. If cancer has been left behind after lumpectomy and partial breast reconstruction, it may be difficult to find the area where the cancer came from in order to remove more tissue and get clear margins. Sometimes in these situations, a total mastectomy is required to guarantee cancer removal.

Immediate-delayed reconstruction is performed 1 to 3 weeks after the lumpectomy to allow examination of the pathology and confirm cancer removal prior to starting the reconstruction. This technique is usually favored for women with larger or multifocal tumors when the risk for leaving cancer behind after lumpectomy is higher. By waiting for the pathology results, the cancer can be confirmed gone. If the margins are not clear, another surgery to remove more tissue may be performed more easily since no reconstruction has taken place and the location of the cancer has not been changed or masked by the reconstruction technique. Unfortunately, this guarantees at least two surgeries to complete the process.

Delayed reconstruction is performed after the lumpectomy and radiation have been completed. This procedure is often challenging because of the adverse effects of the radiation therapy which increases the risks for complications especially due to infection and blood circulation problems. Because of breast tissue damage caused by radiation, this technique usually requires complex tissue transfer of a large volume of autologous tissue either from the abdomen or the back.

**WHAT ARE THE RISKS AND/OR POSSIBLE COMPLICATIONS?**

As with any surgery, there are risks and possible complications.

- Infection
- Seroma (fluid collection)
- Bleeding
- Fat necrosis (fat death)
- Nipple necrosis (nipple death)
- Breast disfigurement
- Breast asymmetry
- Wound opening
- Positive surgical margin
- Anesthesia risks

Some of these complications may require further surgery. Your plastic surgeon will review these risks during your office visits and answer any questions.

**Infection**

Infection may occur anywhere there is an incision. Treatment usually involves antibiotics and possible drainage of the infection. If a seroma becomes infected, surgery is usually required to remove infected fluid. If an implant was placed, there is risk for implant loss. Infections may also cause nipple necrosis (nipple death).

**Seroma**

A seroma is a collection of fluid in the breast. A seroma may cause discomfort and pain and increase the risk for infection. Drains can reduce, but not eliminate, the risk of seroma. Drains are usually needed for 1 to 3 weeks.

**Bleeding**

Bleeding may develop after any surgery and require an urgent return to the operating room. If enough bleeding occurs, blood transfusions may be necessary to keep the patient's blood pressure normal. Sometimes, a smaller amount of bleeding occurs to form a blood collection called a hematoma. A hematoma in the breast may cause circulation problems resulting in tissue necrosis. This usually requires an urgent return to the operating room.

**Fat necrosis**

Breast fat may die and form hard, painful lumps of scar tissue after rearrangement during reconstruction surgery. Sometimes, these lumps need to be removed which may further disfigure the breast.

**Nipple/areola necrosis**

Poor circulation to the nipple and areola may cause tissue death (necrosis). This risk is higher when tumors are near or under the nipple/areola complex and after radiation therapy. Sometimes the nipple/areola complex has to be removed completely and grafted back onto the breast after rearranging the tissues and closing the skin. This is called a free nipple graft. If this is necessary, your nipple will be completely flat, have no sensation and lose some pigmentation. Sometimes the tissue does not survive this process.

**Breast disfigurement**

The goal is to minimize any disfigurement of the breast but this is not always possible. The breast will change dramatically after radiation therapy and any scarring within the breast will worsen and potentially distort the surrounding breast tissue.

**Breast asymmetry**

There will always be some breast asymmetry due to scarring, volume changes and radiation therapy. How much asymmetry will be dependent on many variables including the size of the breast, location and size of the cancer, and the patient's response to radiation therapy.

**Wound opening**

Wounds may require months to completely heal. The incision may open, especially if a seroma, infection or both are present. This risk is increased in smokers, severely obese patients, women who've had prior abdominal surgeries, and after radiation. Sometimes the wound can be cleaned as a minor procedure and the wound re-closed.

**Positive surgical margin**

Positive surgical margins can complicate reconstruction and require a second surgery to remove the tissue and

get a "clean" margin. However, when a lumpectomy and partial breast reconstruction are performed at the same surgery (immediate reconstruction), the deep breast tissue has been rearranged and it may not be possible to go back in and remove the cancerous tissue. Therefore, a total breast mastectomy must be performed to completely remove the cancer.

**Anesthesia risks**

All surgery carries some risk including heart attack, stroke, deep vein thrombosis (blood clots in the legs), pulmonary embolism (blood clots in the lungs), allergic reactions to medications, death and others. These risks are variable and increase with age, chronic medical problems (obesity, diabetes, hypertension, peripheral vascular disease, etc.) and smoking.

## WOUND HEALING AND SCAR FORMATION

Just as sure as night follows day, your mastectomy or lumpectomy will leave a scar. You can expect some scarring on or around your breast. You will also have a scar on your back or belly if your breast reconstruction uses tissue from those areas.



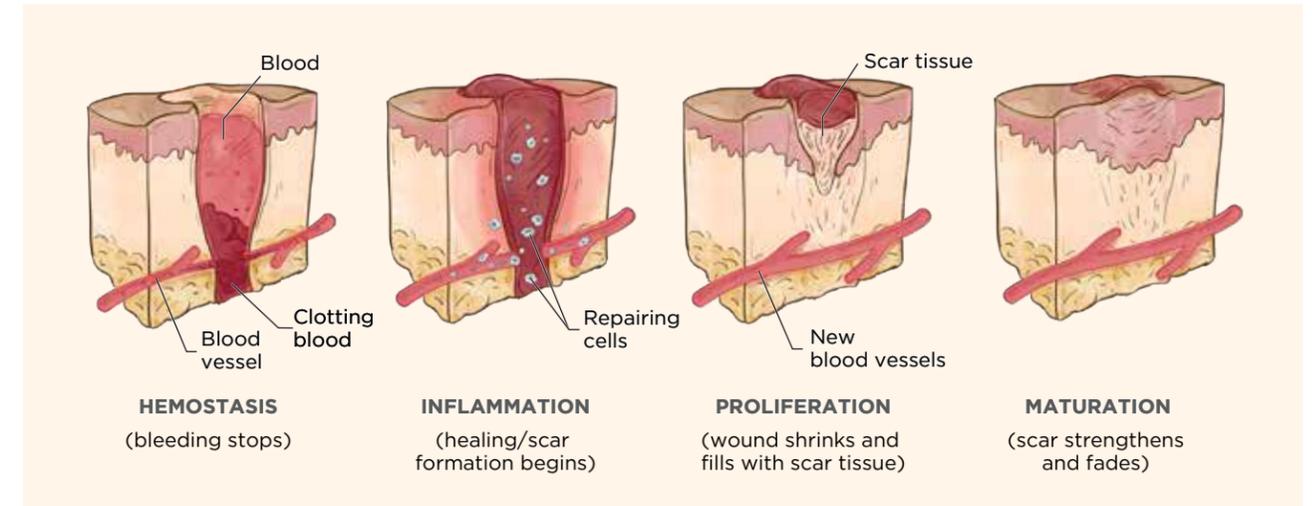
On the bright side, scars are a good thing — they're nature's way of healing and repairing your skin after cancer surgery and breast reconstruction. Many scars fade

and become less noticeable over time, but there's no such thing as "scarless" surgery or some magical therapy to "erase" scars.

### WOUND HEALING/ SCAR FORMATION PROCESS

Most wounds heal and form scars in four stages that tend to overlap each other. This is a complex process that can take months or even years.

- Immediately after surgery, your body starts to constrict blood vessels and form clots. This step stops the bleeding.
- Within hours, cells move in to clean and repair the wound. This is the beginning of scar formation. Your wound will likely be swollen, pink, tender and itchy.
- At the same time, your body gets busy building a new network of blood vessels. The wound starts to shrink while it fills with scar tissue and eventually is covered by a layer of skin.
- After about 6 weeks, your scar is strong and begins to fade over the next 12 months, although it will never be as strong or the same color as your original skin.



### HELP YOURSELF HEAL

There are many factors you can control to help your body heal.

- Eat healthy food. Malnutrition is a big factor in healing — a poor diet can turn a normal wound into a chronic wound.
- Control your chronic medical conditions. Medical conditions such as diabetes, vascular disease and malnutrition can slow the healing process.
- Minimize steroid use. Many types of medications, including steroids, can affect healing.
- Watch your weight. Obesity can interfere with the healing process.
- Stop smoking and go easy on the alcohol.

### "ABNORMAL" SCARS

Scars that are thin, flat and pale are considered "normal" scars. But not all scars eventually fade into the background.



Some women can develop "abnormal" scars that can be unsightly, itchy and even painful. Anyone can develop abnormal scars, but they're more common in people with darker skin.



Hyperpigmented  
Hypertrophic Scar



Hyperpigmented  
Keloid Scar



#### Post inflammatory hyper-pigmentation

- Halo around scar and scar itself are darker
- May be improved with a topical cream, such as a bleaching cream

#### Hypo-pigmentation

- Lighter scar color than the surrounding tissue

**BREAST RECONSTRUCTION WILL ALWAYS LEAVE A SCAR,  
BUT MOST SCARS FADE AND  
BECOME LESS NOTICEABLE OVER TIME.**

Common types of “abnormal” scars are hypertrophic, keloid, and hyper- or hypo-pigmentation.

#### Hypertrophic scars

- Wide and raised
- Remains within the original border of the incision and does not extend into normal tissue around the wound
- Stops growing after about 6 months
- May be cut out and re-sutured, but may return larger than before
- Steroid injections can improve scars

#### Keloid scars

- Wide and raised
- Keeps growing beyond the original wound and often invades normal tissue
- May be cut out and re-sutured, but may return larger than before
- Steroid injections can improve scars

#### IMPROVING THE LOOK OF A “NORMAL” SCAR

There are a number of ways to improve the look and feel of a “normal” scar.

- **Sunscreen** can improve healing and prevent scar discoloration.
- **Scar massage** releases enzymes that can help make your scar flatter and more pliable.
- **Hydration** can help decrease pain, itching and tightening. There are many products that help your scar maintain moisture including petrolatum-based ointments, microporous hypoallergenic paper tape, and silicone gel or sheeting.
- **Silicone-based products** may help your scar fade and decrease the swelling of hypertrophic scars.

Vitamin E and non-silicone based scar creams are generally not effective. Use silicone-based ointments instead. There are no clinical studies evaluating herbal or alternative medicine to determine if they are effective.

Ask your plastic surgeon what kind of treatment or product might help improve the look of your scar or relieve symptoms that are bothering you.

#### IT'S GOOD TO KNOW

Your plastic surgeon will work to minimize scarring, but there's no way to avoid a scar — it's just the way a body heals itself.



Most women heal and form a scar without any problem — other than a bit of itching and tenderness.

If you do have a problem, we're here to help you resolve it and get on with your life after cancer.

**HOW DO SURGICAL WOUNDS HEAL?**

Wounds heal either by primary intention or by secondary intention.

Healing by primary intention occurs when the two edges of a surgical wound are brought together and allowed to heal while directly touching each other. Wounds are commonly closed with sutures or glue. No granulation tissues form between the skin edges, which usually results in a thinner, less visible scar. This type of wound usually is water tight after 24 to 48 hours. There is also less contraction (shrinkage) of the scar with this method.

Healing by secondary intention occurs when two skin edges cannot be brought directly together because the wound is too big or tissue has been lost. Therefore, granulation tissue fills the wound bed and the skin will re-epithelialize from the wound edges to seal the wound. It may take the wound days or months to become water tight depending on the size of the wound. There is more contraction of the wound compared to primary intention, possibly resulting in distortion of the surrounding tissues. However, this is variable depending on the patient's genetic response, location of the wound, and looseness of the surrounding skin. This method results in wider more visible scars with different color, texture and contour than nearby skin.

**WHAT FACTORS AFFECT WOUND HEALING?**

There are many factors that affect wound healing, including:

- Nutrition
- Medical conditions
- Medications
- Smoking
- Chemotherapy
- Radiation

**Nutrition**

Good nutrition is vital to the body's ability to create the building blocks necessary to heal a wound. The risk for wound healing problems increases with an Albumin of less than 2 (marker for long-term nutrition over the past 3 months) or a pre-albumin less than 20 (marker for short-term nutrition over the past month).

**Medical conditions**

Medical conditions such as diabetes, vascular disease and high blood pressure can cause poor tissue blood flow that impairs wound healing. Diabetes increases the risk for infection due to decreased immune function, slower collagen syntheses, decreased blood vessel formation and decreased scar strength, all of which lead to a high risk of wound dehiscence (wound opening). Glucose levels of more than 200 mg/dL are associated with worse outcomes.

**Medications**

There are many different types of medications that can inhibit wound healing and the ability to fight off infections. Steroids, which are commonly used for many types of medical problems, can affect wound healing. Steroids both slow down the wound-healing process and suppress the immune system, increasing the risk for wound infection and dehiscence.

**Smoking**

Smoking has a negative effect on wound healing due to the direct toxic effects of smoking and the vasoconstriction caused by nicotine. Smoking has been shown to significantly increase the risk for infections and wound dehiscence by decreasing the function of cells that fight off infection and produce collagen. These conditions may linger for months after stopping smoking.

**Chemotherapy**

Chemotherapy prevents cells from dividing. This is good for killing cancer but bad for healing and fighting off infections.

**Radiation**

Radiation prevents cells from growing by causing cell death, scarring and decreased blood flow to the area. This creates a hostile environment for growing cells which is good for preventing cancer spread but bad for surgical healing. All surgical risks are increased in an area that has been exposed to radiation. Tissues do not heal well after radiation. Sometimes incisions

open up after surgeries due to poor circulation or infections. Some tissue may even have necrosis (death) after surgery due to this poor circulation.

**WILL RECONSTRUCTION SURGERY LEAVE A SCAR?**

Yes. Scars will form after all surgeries. There will be visible scars on the reconstructed breast, on the "normal" breast if symmetry surgery is performed, as well as on the back or abdomen if tissue is used from those areas. The scars on the two breasts may look different from each other. Their visibility will be dependent on each patient's genetics and how they form a scar.

The scarring process usually takes up to a year. There is a great amount of variability with scar formation. Darker skin usually forms darker scars while lighter skin usually forms lighter scars. Sometimes scars can be irritated, itchy and even painful. Too much scarring may affect the size, shape and look of the breast.

**WILL SCARS FADE OVER TIME?**

Many scars end up thin, flat and pale over time. These are considered "normal" scars. But not all scars fade over time and can become unsightly, itchy and even painful. These "abnormal" scars are caused by the genetic over-response of a patient's healing process.

Abnormal scars may be wide and raised, but remain within the borders of an injury or wound (hypertrophic scar).

Scars may be thin or thick and may grow beyond the edges of an incision (keloid scar).

A dark halo may form around a scar (post inflammatory hyper-pigmentation).

### WHAT ARE HYPERTROPHIC SCARS?

Hypertrophic scarring is characterized by wide, raised scars that remain within the original borders of an injury. They have a rapid growth phase over the first six months after injury with a gradual regression over a 1 to 3 year period to a flat and wide scar. There is more risk for this type of scarring when the tissue is closed under tension or if an infection is present. These scars may be unsightly, itchy and even painful prior to their regression. Hypertrophic scars are more common in darker-skinned people, but may happen in anyone. It may be possible to prevent these scars by avoiding undue tension, infections and avoiding healing by secondary intention. (Healing by secondary intention occurs when two skin edges cannot be brought directly together because the wound is too big or tissue has been lost. Therefore, granulation tissue fills the wound bed and the skin will re-epithelialize from the wound edges to seal the wound.)

In high-risk patients, silicone gel or sheeting is recommended as the first line therapy. Some people may require intralesional injections of steroids, but these may thin the skin, cause hypo-pigmentation and form small blood vessels in the skin. Pulsed-dye lasers are also effective in improving the texture, redness, size and pliability of these scars. Ultimately, scar revision can be performed by cutting out the scar and re-suturing the wound, thus starting over and allowing the wound to heal again. The biggest risk after scar revision is recurrence of the hypertrophic scar.

### WHAT ARE KELOID SCARS?

Keloid scarring is characterized by firm, large tumor-like scars that extend beyond the original borders of the injury. These scars do not regress spontaneously and can develop several years after injury. These are unsightly, disfiguring, and are very symptomatic with itching, redness, and pain that does not spontaneously resolve with time. Keloid scars are more common in darker-skinned people, but can happen in anyone. It may be possible to prevent these scars by avoiding surgery if possible, avoiding undue wound tension, preventing infections and avoid healing by secondary intention. (Healing by secondary intention occurs when two skin edges cannot be brought directly together because the wound is too big or tissue has

been lost. Therefore, granulation tissue fills the wound bed and the skin will re-epithelialize from the wound edges to seal the wound.)

In high-risk patients, silicone gel or sheeting is recommended as the first line therapy. Some people may require intralesional injections of steroids during the healing process, but these may thin the skin, cause hypo-pigmentation and form small blood vessels in the skin. Pulsed-dye lasers are effective in improving the texture, redness, size and pliability of these scars. Ultimately, revision of the scar can be performed by cutting it out and re-suturing the wound, thus starting over and allowing the wound to heal again. Multiple rounds of steroid injections are required after scar removal. Sometimes, low dose radiation therapy may be used to reduce the risk of keloid recurrence after scar revision. However, there is a small risk for other cancers to form in the future after radiation therapy. The biggest risk after scar revision is recurrence of an even larger keloid scar.

### WHAT IS POST INFLAMMATORY HYPER-PIGMENTATION?

Post Inflammatory hyper-pigmentation occurs when cells that form pigment in the skin are induced to form even more pigment during the healing process. This

may produce a dark “halo” around scars after the healing process is complete. This is more common in darker-skinned people who have more pigment-making cells in their skin. Treatment is directed at decreasing the amount of inflammation present by avoiding healing by secondary intention and placing topical steroids to decrease inflammation. In addition, topical bleaching creams (hydroquinone) or retinoic acid creams (tretinoin) may be used to help reduce some hyper-pigmentation.

### CAN THE LOOK OF SCARS BE IMPROVED?

The visibility of scars is primarily dependent on a patient’s genetic ability to form scars. Surgical incisions that are placed in difficult-to-see areas and allowed to heal by primary intention with sutures or glue will encourage thin scar formation. Complications from infections and delayed healing may lead to wound dehiscence (wound opening) which requires healing by secondary intention. This creates a wider scar with a different contour, color and texture than the surrounding tissue, resulting in a more noticeable scar. In addition, there is more potential for wound contraction resulting in possible distortion of the surrounding structures.

### WHAT TREATMENTS AND TECHNIQUES MIGHT IMPROVE THE LOOK OF A SCAR?

#### Sunscreen

Sunscreen helps prevent post-inflammatory hyper-pigmentation by preventing ultraviolet light from stimulating the pigment cells in the skin. Most surgeons recommend using a sunscreen of SPF 35 or higher. Start using the cream about 1 to 2 weeks after surgery after the wound is completely closed and continue for at least one year.

#### Scar massage

Massaging a scar helps flatten it more quickly by releasing enzymes that increase the pliability of the scar. Don't start until the wound has had adequate time to heal, about 14 days after surgery. Apply enough pressure to blanch the scar and massage for 10 minutes twice per day for at least 1 to 2 months.

#### Hydration ointments

Hydration ointments help by maintaining moisture in the scar. They are effective in decreasing scar symptoms (pain, itching and tightening) but it is unclear and variable on how much they help with improving the scar appearance.

#### Petrolatum-based ointments

Applying petrolatum-based cream three times per day for one month has shown a reduction in the redness of post-surgical scars.

#### Microporous hypoallergenic paper tape

Wearing microporous hypoallergenic paper tape continuously for three months

after surgery has been shown to decrease scar volume and reduce the risk for hypertrophic scars. The tape decreases tension on the scar.

#### Silicone gel or silicone sheeting

Silicone gel or silicone sheeting can reduce the pigmentation, vascularity, height, pain and itchiness of scars. Silicone gel should be applied twice a day for 6 months. Silicone sheeting should be worn at least 12 hours a day for 6 months after surgery.

#### Pressure dressings

Pressure dressings have been shown to improve keloid scarring, especially with regards to keloid scars on the ear.

### WHAT PRODUCTS MIGHT NOT IMPROVE THE LOOK OF SCARS?

#### Vitamin E

There is no improvement in the cosmetic appearance of post-surgical scars treated with vitamin E as compared with petrolatum-based ointments. In fact, some studies show a higher incidence of rashes caused by vitamin E relative to other ointments.

#### Scar creams

There is no improvement in the cosmetic appearance of post-surgical scars treated with non-silicone based scar creams as compared to petrolatum-based ointments.

#### Herbal/alternative medicine

There are no clinical studies evaluating herbal/alternative medicines and it is unclear if they improve scar appearance.

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