










Breast reconstruction - patient information guide

Plastic surgeons are frequently involved in the primary reconstruction of the breast following a mastectomy – that is, following the whole or partial removal of the breast to help treat or prevent breast cancer.

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1. Introduction

Reconstructive breast surgery is a multi-disciplinary treatment, coordinated with cancer surgeons and cancer specialists (known as oncologists). Reconstructive surgery aims to rebuild the breast, either wholly or partially, to normalise the look of the breast and leave the patient with a symmetrical bust. It also aims to improve the patient's body image and self-esteem, helping the process of recovery on a physical, emotional and psychological level.

Current evidence suggests that breast reconstruction, either at the time of (immediate) or after (delayed) cancer treatment, has no adverse effect on the outcome of a patient's cancer. According to guidance from the National Institute of Clinical Excellence ([NICE link](#)), all patients should be offered immediate breast reconstruction following a mastectomy.

Breast reconstruction can be a complex procedure, often involving microsurgery techniques; it is therefore best carried out in specialist centres equipped with state-of-the-art facilities. As patient awareness of breast reconstruction grows, there is likely to be increasing demand for this procedure – as a result, plastic surgeons are becoming common and integral parts of the multi-disciplinary teams treating breast cancer in the UK.

2. What causes breast cancer?

Breast cancer is the most common form of cancer affecting women in the UK, with 40,000 new cases diagnosed every year. Cancer occurs when normal cells stop responding to the control systems used to co-ordinate the function of cells. These rogue cells start to multiply abnormally, forming cancerous tumours. The reason for this cell dysfunction is the subject of much research and debate, but is a combination of environmental, lifestyle and genetic factors.

The treatment of breast cancer is based on the elimination of these rogue cells, whether through surgical excision or by killing them with radiotherapy and chemotherapy. The type of treatment a patient requires depends upon the type of breast cancer, and the extent to which the cells have spread within and beyond the breast. Your breast surgeon will discuss the options available for you and will help guide your decision.

3. What is a mastectomy?

About 40% of women diagnosed with breast cancer require or choose to undergo mastectomy, the surgical removal of the entire breast. The breast is positioned between the skin of the chest and the chest wall muscles, and consists of milk ducts, glands, fat and some connective tissue holding all of these components together. The glands produce milk, which runs via the ducts to the nipple. As the nipple is connected to the entire breast and the cancer can involve the ducts, the nipple must usually be removed as part of the mastectomy.

Mastectomy is recommended for women with certain types of breast cancer.

The details should be discussed with your breast surgeon, but generally a mastectomy is recommended if:

- cancer is present in two or more areas of the breast;
- the breast has been previously treated with radiotherapy;
- a large tumour is found in a small breast; and if
- the tumour is likely to recur.

On discovering cancer within one breast, many women prefer to have that entire breast, or even both breasts, removed to minimise the chance of breast cancer in the future.

4. What surgery is available, and what techniques are involved?

Breast reconstruction involves recreating the breast to match the remaining natural breast as closely as possible. The main aim is to recreate the breast shape and volume, either at the same time as the mastectomy, or at a later date.

One of the first choices confronting patients is whether to undergo immediate or delayed reconstruction. Immediate reconstruction is performed during the same operation as the mastectomy. Delayed reconstruction occurs once a patient has fully recovered from a mastectomy (usually after several months).

The benefits of immediate reconstruction are:

- Better cosmetic results
- The skin of the breast can be preserved
- Smaller breast scars
- Only one anaesthetic and recovery period
- Only one stay in hospital
- No period of time without a breast

The benefits of delayed reconstruction are:

- Staggered surgery, resulting in an easier and shorter recovery following each procedure
- Time to consider whether reconstruction is right for you without delaying the cancer treatment
- Less to deal with at once

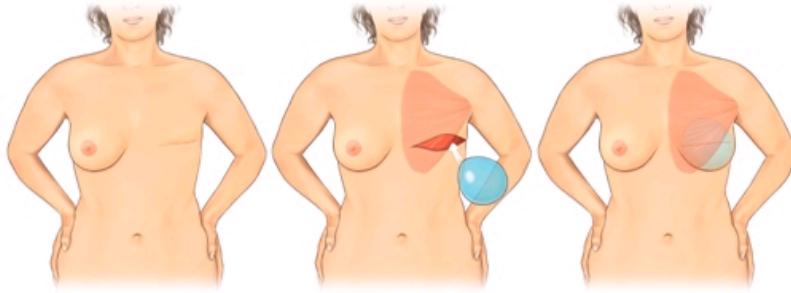
The favoured technique amongst many plastic surgeons is to use a patient's own tissue to reconstruct the breast. In recent years, own tissue or autologous reconstructions have become more and more popular amongst patients. This tissue is usually taken from the abdomen or back, but sometimes from the buttocks or thighs. For some patients, however, an implant-based reconstruction is more appropriate.

Finally, some women still opt not to have their breasts reconstructed at all. Many women feel radically changed by their cancer experience, and some feel that a flat chest is an apt

acknowledgement and expression of their post-cancer persona. Others may opt to wear a prosthetic breast rather than undergo further surgery.

5. Implant-based reconstruction

When a breast is reconstructed using an implant alone a silicone implant is inserted under the skin and muscle of the chest to replace the breast volume that has been removed at the time of mastectomy. This is quite a simple operation that does not involve incisions elsewhere on the body. Sometimes an adjustable implant called an expander-prosthesis can be used, this is adjusted by injections of saline which can be done in the outpatient clinic in the weeks after the operation.



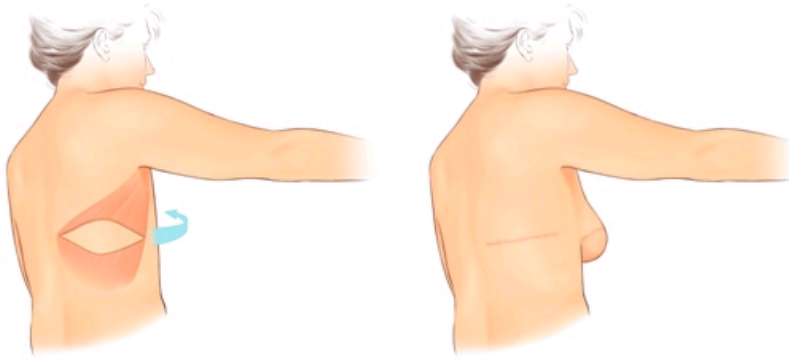
In implant-based reconstruction a silicone implant is inserted behind the chest wall muscles. Sometimes an inflatable tissue expander-prosthesis is used to stretch the overlying tissues and allow adjustability after the operation.

Implant-based reconstruction is usually advised for patients who are not suitable for autologous reconstruction. This might be because they have no spare tissue to use, they are not medically fit for a larger operation, or they simply do not want a big operation involving incisions and scars elsewhere on the body. It is best for patients with relatively small breasts that do not droop at all. It can be difficult to get a natural breast shape with an implant alone so can be effective if both breasts are being removed.

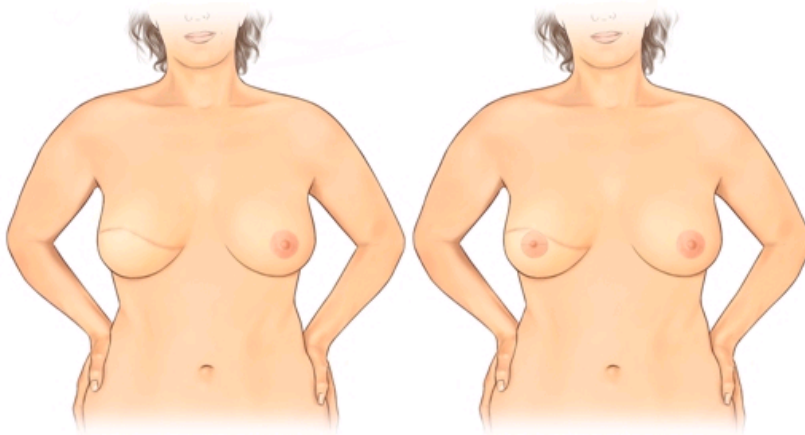
The main disadvantage of implant-based breast reconstruction is that it is impossible to create a breast with a natural shape and feel. No skin is replaced so it cannot be used where there is a need for skin replacement. Most patients having an implant-based reconstruction will require adjustment of the opposite breast to improve the shape and size match. Whilst the breasts can look a reasonable match whilst dressed they will usually be different shapes when undressed. Many patients who have implant-based reconstruction will need to have further operations in the future to adjust or exchange their implant. Implants are prone to hardening, deflation, visible folds and creases, and do not give good results in patients who have radiotherapy.

6. Latissimus Dorsi flap reconstruction

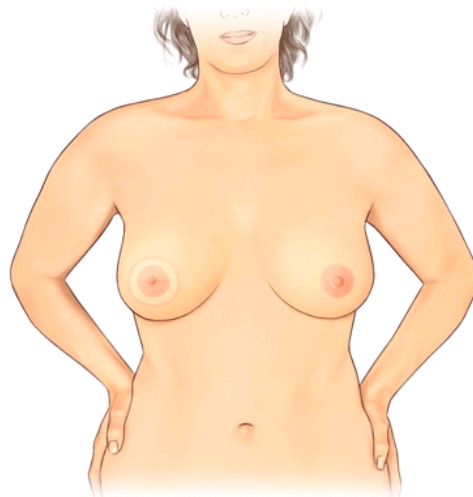
One type of flap transfer for breast reconstruction uses the latissimus dorsi muscle from the back along with an overlying patch of skin. This muscle's blood supply makes it extremely useful for breast reconstruction, as it gets its main blood supply from vessels emerging from the armpit. In this procedure, the muscle is transferred to the breast area by swinging it around the ribcage so that it lies at the front of the body. Using this procedure skin removed at the time of mastectomy is replaced along with some volume. Some patients will also need an implant to further augment the volume, but it is sometimes possible to remove enough fat from the back attached to the flap to replace the missing breast volume without an implant. This is called an autologous latissimus dorsi reconstruction.



In latissimus dorsi breast reconstruction a flap consisting of the latissimus dorsi muscle along with a patch of overlying skin is taken from the back and rotated around to the front in order to recreate the breast. An implant is sometimes need beneath the flap.



This shows the expected result of a delayed latissimus dorsi breast reconstruction. The flap has replaced the skin that was removed at the time of the mastectomy. The volume is replaced either with just the muscle and fat of the back, but if this is insufficient an implant is also used. The second picture shows the final result after nipple areola reconstruction.

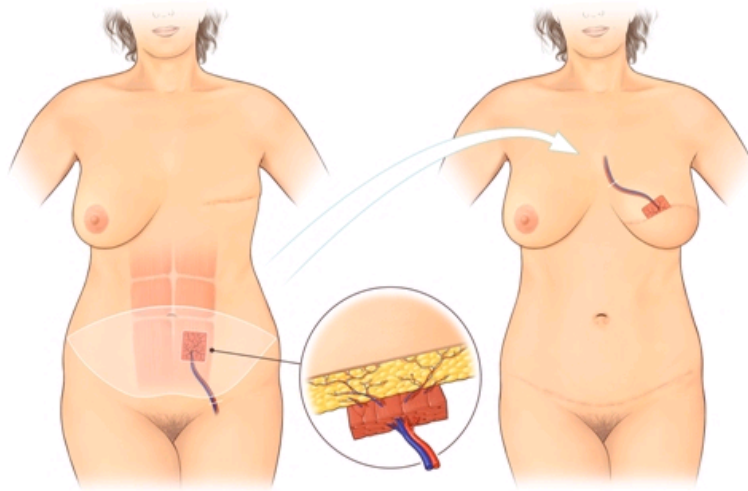


In immediate breast reconstruction it is often possible to preserve most of the breast skin. In this case only a small disc of skin including the nipple areola has been removed at the mastectomy. This skin disc and the breast volume has been replaced using a flap. A nipple areola reconstruction has also been done.

A latissimus dorsi flap reconstruction is a larger operation that using an implant alone, but will usually give a more natural result, particularly if an implant is not needed. It is a very durable and reliable flap. It does result in quite a large scar on the back, but this can usually be positioned to be concealed by most clothing and underwear. Losing the muscle from the back does not seem to cause any restriction of shoulder movement or strength in most patients. Latissimus dorsi flap reconstruction is most suitable for patients who do not need much skin replacement and whose abdomen is not suitable for flap transfer. It can be ideal for relatively heavily built patients who have small to medium sized breasts.

7. Abdominal flap reconstruction

The skin and fat of the lower abdomen is often the ideal tissue for breast reconstruction. A large amount of skin and volume can be replaced in order to achieve a very natural look and feel. Removal of excess skin and fat can often be a welcome bonus for the patient, resulting in a "tummy tuck". When first described the operation involved tunnelling the lower abdominal flap with the underlying rectus abdominis muscles beneath the upper abdomen to the chest – a pedicled TRAM flap. Whilst this technique is still sometimes used most surgeons find that transferring this tissue as a free flap is more reliable. Free flap reconstruction involves the transfer of living tissue from one part of the body to another, along with the blood vessel that keeps it alive. Free flaps are entirely disconnected from their original blood supply and are reconnected using microsurgery in the recipient site. This procedure involves hooking up all the tiny blood vessels of the flap with those in the new site, and is carried out with use of a microscope, hence the name 'microsurgery'.



This illustrates a breast reconstruction using a free lower abdominal flap. A large flap of skin and fat from the lower abdomen is raised along with the blood vessels that keep it alive. In this case a small portion of muscle has also been taken (TRAM flap). In some cases it is possible to take the blood vessels without taking any muscle (DIEP flap). The flap is transferred to the chest to replace the missing skin and volume. The blood vessels of the flap are joined microsurgically to blood vessels in the chest to restore the blood supply to the flap.

In free flap breast reconstruction, skin, fat and sometimes muscle from one part of the body is transferred to the breast area. During this process, the skin and fat is completely removed from the original area and reconnected in the recipient site. Blood vessels from the armpit, or near the breastbone, are used to create a new blood supply for the transferred tissue. There are several variants of lower abdominal free flap transfer depending on which blood vessels are used and whether any muscle is transferred, these are:

Types of lower abdominal free flaps

Free TRAM flap - In this operation a small piece of muscle is taken along with the blood vessels, skin and fat

Free DIEP flap – this variant uses the same blood vessels as the TRAM flap, but they are carefully dissected out from the muscle when the flap is raised and DIEP flap contains no muscle

Free SIEA flap – In this operation some of the more superficial blood vessels on the

tummy are used and no muscle is dissected or transferred

Each of these flaps can achieve the same thing in terms of the eventual reconstruction, but the DIEP and SIEA involve less or no interference with the function of the tummy muscles. Some surgeons have a particular preference and experience with one or other variant. Sometimes the exact flap used is decided during the operation so it is not possible for the patient to pick one technique that will definitely be used. The patient has to rely on the surgeon to use the most reliable technique in the circumstances.

Whilst abdominal flap reconstruction can give excellent results it must be recognised that this is a major procedure. Patients spend up to a week in hospital and will undergo a recovery period lasting several weeks. There will be scars on the breast and a large scar across the abdomen as well as around the umbilicus. There may be some difficulty sitting up from lying down initially if the abdominal muscles are dissected, but in the long term most patients notice no real problems. All breast reconstruction is a process and many patients will need further procedures to adjust their reconstruction. These are usually minor procedures such as liposuction to reduce the size of the flap, scar revisions, lipofilling or nipple reconstruction. That said, autologous reconstruction is durable and once a satisfactory result is achieved it tends to be static and permanent.

8. Other Flaps

Where the abdomen is unavailable or unsuitable flaps can be taken from the buttocks or upper inner thighs. These flaps are much less commonly used and not all breast reconstruction centres will offer these techniques so you might have to travel to see a suitable expert if this is the best option for you. Buttock flaps are based on one or other of the blood vessels emerging from the buttock muscles, the flaps are known as SGAP flaps or IGAP flaps. Flaps from the upper inner thighs are known as TUG flaps. In general these other flaps are used in patients who want autologous reconstruction and who are very slim or have had previous abdominal surgery.

Flaps containing muscle are named after the muscle

Flap type	
TRAM	Transverse rectus abdominis muscle from the abdomen
Latissimus dorsi	Latissimus dorsi muscle from the back
TUG	Transverse upper gracilis muscle from the upper inner thigh

Perforator flaps only contain skin and fat and are named after their artery

Flap type	
DIEP	Deep inferior epigastric perforator from the abdomen
SIEA	Superficial inferior epigastric artery from the abdomen
IGAP	Inferior gluteal artery perforator from buttock crease
SGAP	Superior gluteal artery perforator from the upper buttock

9. What should I expect as a patient?

All patients considering breast reconstruction should have the opportunity to have a consultation with a plastic surgeon who has an interest in breast reconstruction in order to discuss their options. At this consultation all your options will be explored and discussed. In some patients there is really only one type of procedure that can be recommended, but some patients will have a choice to make. Consideration is given to how much skin and volume needs to be replaced, how much is available in the various flap donor sites, the general fitness of the patient, their preferences in terms of outcome and donor scarring, possible interference with other treatments and whether the other breast can be matched or if it needs to be adjusted.

Once the decision to proceed has been made you will have a preadmission assessment and clinical photographs. All breast reconstructions are done under general anaesthesia. When you come round you will have some dressings and drains. Various techniques are used to make the process as painless as possible. With free flap breast reconstruction you will have a period of careful monitoring for the first day or so after the operation, but will then be allowed to get up and about.

Once you go home from hospital you will feel very tired initially, and would be advised to have someone around to help you. After the first week you should be starting to look after yourself and begin to resume normal activities. The recovery period varies depending on which of the operations you have had done. A few weeks after the operation you will be seen again in clinic to check how you are doing and make sure all your wounds are healing well. You will then be seen a few months later to assess the outcome.

Surgical adjustments are often needed following breast reconstruction, and it may be necessary for patients to undergo one or two smaller procedures, aimed at slightly altering the shape of the breast or creating a nipple and areola.

10. What complications can occur?

With any operation there are some risks, steps are always taken to minimise these risks. The most frequent complication is delayed wound healing. This risk is greatest in some of the larger flap operations where the incisions are longer. If there is a wound problem it is usually minor, but more major wound healing problems can occur such as infection, skin loss, wound separation and possible reoperation. Very occasionally, soon after the surgery, bleeding may occur this may necessitate a return to theatre to stop the bleeding. Sometimes patients can collect fluid beneath the operation site, this may need to be drained off in clinic. If an implant is used there are some [specific complications](#) that can happen. In some abdominal flap surgery there is a risk of abdominal muscle weakness or perhaps even a bulge or hernia. There is a slight risk of blood clots after the operation occurring in the legs or lungs, steps will be taken before during and after the operation to minimise this risk. In flap surgery there is a risk that the circulation to the flap may cease, if this occurs it is usually in the first day or so. You will be monitored carefully to spot this, but if it occurs you will need to go back to the operating room to remedy the problem. The microsurgery may need to be redone, if so circulation will usually be restored. However there is a slight risk that it cannot and the flap is lost. The relative risk of these various complications varies between operations and the likelihood of them happening in your operation will be discussed with you. There is not much that you can do to minimise any of these risks, but in delayed reconstruction patients may be advised to try to lose weight before the operation, all patients should stop smoking prior to surgery.

11. Where can I go for more information?

[Download the BAPRAS Guide to Breast Reconstruction](#)

[British Association of Surgical Oncologists](#)

[Breakthrough Breast Cancer](#)

[Breast Cancer Care](#)

[Breast Cancer Support Board](#)

[Macmillan Cancer Support - Breast cancer](#)

[Cancer Research UK- Breast cancer](#)

Hereditary Breast Cancer Helpline - 01629 813000 (24 hour helpline)

Email: canhelp@btopenworld.com

[Irish Cancer Society](#)

[Look Good...Feel Better](#)

[Options for Breast Reconstruction](#)

[The Center for Microsurgical Breast Reconstruction](#)

The Boudica Within: The extraordinary journey of women after breast cancer and reconstruction by Elaine Sassoon published by The Erskine Press, 2007 ISBN 978-1-85297-097-0

Department of Health - [Guide to breast screening](#)

Department of Health - [Be breast aware](#)

[My New Breast](#)- A BBC documentary profiling the work of plastic surgeons at the Canniesburn unit in Glasgow

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