

RECONSTRUCTIVE SURGERY: SOFT TISSUE FREE FLAPS

This information aims to help you understand the operation, what is involved and some common complications that may occur. It may help answer some of your questions and help you think of other questions that you may want to ask your cancer care team; it is not intended to replace advice or discussion between you and your [cancer care team](#).

AN OVERVIEW TO RECONSTRUCTIVE SURGERY USING SOFT TISSUE FREE FLAPS

- Surgery for head and neck cancer can lead to some major changes in the appearance of your head and neck, and in functions such as eating, talking and breathing.

RECONSTRUCTIVE SURGERY:

- may be needed to rebuild the area if a large area of tissue or bone was removed during surgery.
- will be planned by considering:
 - how to get the tissue to heal quickly, to avoid a long stay in hospital
 - how best to protect vital organs, such as major blood vessels
 - the safety
 - how you will look following the surgery
 - how best to improve functions such as speaking, breathing, chewing and swallowing.
- There are different ways of rebuilding the tissue including:
 - [Skin grafts](#) – a layer of skin laid on the wound
 - [Local flaps](#) – moving tissue with a blood supply from next to the wound
 - [Regional flaps](#) – moving tissue on a stalk (blood vessels) from somewhere near the head and neck, like the chest
 - [Free flaps](#) – moving tissue from somewhere else in the body with its own blood vessels. This includes bone and soft tissue free flaps.

SOFT TISSUE FREE FLAPS:

- are often used after surgery to remove cancers from the mouth or throat, they are called 'soft tissue' because they don't use **hard tissue like bone**.
- use tissue from another part of the body such as the arm, leg, back, or belly (abdomen). The area where the flap is taken from is called the **donor site**.
- are different to **skin grafts** because they have their own blood supply called the **pedicle** (an artery and a vein from its original location) which is moved with the tissue to keep it alive
- involves specialised surgery under the microscope (microvascular anastomosis) so that the blood vessels of the flap are connected to the blood vessels in the neck.
- require a team of surgeons with special expertise and takes many hours to perform. A [multidisciplinary team](#) is often involved in planning and undertaking the operation, and helping you after the operation.

TYPES OF SOFT TISSUE FREE FLAPS:

There are many different types of **soft tissue flaps**. They use different types of tissue depending on what is needed for the reconstruction. Some of the common flaps include:

- **Skin (+/- muscle)**
 - **Radial forearm flap:** uses skin and fat from the inner aspect of the forearm. This flap is thin and easily moulded. Usually a skin graft is needed to cover where the flap was taken from (donor site). A plaster is usually put on the arm until the skin graft takes. It should not affect the function of your arm or hand once the graft has fully taken but this may take several weeks or longer. The scar is quite noticeable if you wear a short sleeved shirt.
 - **Anterolateral thigh flap:** uses skin and fat from the outer part of the thigh. This flap is thicker than the forearm but varies from person to person. The donor site is closed directly so no skin graft is needed but the scar is quite noticeable if you wear shorts or a bikini.

- **Groin flap:** uses skin and fat from the groin crease. The flap is thicker than the forearm but varies from person to person. The donor site is closed directly (no skin graft) and the scar is well hidden but the pedicle is short, so it will not reach far from the neck.
- **Rectus abdominus flap:** uses skin, fat and muscle from the lower belly (abdomen). The flap is quite thick and is good for reconstructing deep holes. The donor site is closed directly (no skin graft). The scar depends on how the surgeon raises the flap (there are different types VRAM, TRAM, DIEAP – ask your surgeon) but is hidden if you wear a shirt.
- **Latissimus dorsi flap:** uses skin, fat and muscle from your back. The flap is good for reconstructing large flat holes. The donor site is closed directly (no skin graft). Sometimes only the muscle part of the flap is used. In this case a skin graft is put on the muscle where the flap ends up. The scar is well hidden if you wear a shirt.
- **Muscle**
 - **Gracilis flap:** uses a muscle from the inner thigh. The flap is good for reconstructing the smile in patients with facial paralysis because the nerve supplying the muscle can be joined to nerves in the face (see [facial nerve sacrifice](#)). The donor site is closed directly and the scar is well hidden.
 - **Vastus lateralis flap:** uses a muscle from the outer thigh. It can be used for lots of different reasons and is often combined with an anterolateral thigh flap because they have the same blood supply. The donor site is closed directly but the scar is visible if you wear shorts.
- **Bowel**
 - **Jejunal flap:** Uses the small bowel. The flap is good for reconstructing the throat after a [laryngopharyngectomy](#) because it is a tube for food and liquids to pass through. It involves a cut in the belly (abdomen) which can be painful and occasionally there are serious complications such as bowel blockage (obstruction) or peritonitis due to a leak from the gut.
 - **Gastro-omental flap:** Uses the stomach and fat nearby. The flap is good for reconstructing the throat after a [laryngopharyngectomy](#) particularly after radiotherapy and chemotherapy. It involves a cut in the belly and has similar risks to a jejunal flap.

WHY IS SOFT TISSUE FREE FLAP SURGERY NEEDED

There are a several reasons why a free flap is used. These include:

- The hole (defect) is too large too close together
- The tissue will not function well without a flap, such as:
 - when part of the tongue is removed, which needs to move freely
- Your appearance will be affected without a flap, such as:
 - when part of the jaw is removed
- The tissue may develop a leak if the without a flap, including:
 - food and saliva from the mouth or throat (fistula)
 - fluid around the brain (cerebrospinal fluid – CSF leak)
- The tissue is unlikely to heal without a flap, such as:
 - when you have had previous radiotherapy or many operations
- Reconstructive surgery may be performed at the same time as the primary surgery, or at a later date. Your doctor will advise on the surgeries planned for you.

HOW TO PREPARE FOR THE OPERATION

Before the operation:

- You will need to fast (have nothing to eat or drink) for 6 hours before your operation (unless advised differently by your surgeon or anaesthetist) because the reconstructive surgery is performed under a general anaesthetic (you will be asleep and will not remember what happens during the operation).
- Your surgeon will explain the details of your operation. Be sure to bring up any questions or concerns, and share your needs and wishes with your cancer care team (see box).
- If you are having a flap taken from your arm, make sure that a drip (intravenous cannula) is **NOT placed in the same arm**
- Let your surgeon know if you have had:
 - problems with the blood vessels in your arms or legs such as blocked arteries or clots in the legs (deep venous thrombosis - DVT)
 - previous surgery in the area where the flap will be taken from (donor site)
- Let your surgeon know if:
 - your work involves manual labour that could be affected by the flap
 - you enjoy sports that could be affected by the flap
 - your career depends on how you look or speak

Possible questions that you may want to ask your cancer care team

- What are the side effects of taking tissue from another part of the body (donor site)?
- If I have a flap taken from somewhere else, how will it look in its new location?
- Can the flap replace the normal function of the tissue it is replacing?
- What will the donor site look like?
- I do manual labour, will the flap affect my ability to work?
- I enjoy some sports, will the flap affect my ability to play sport?
- Are there any things I will find more difficult to do as a result of the flap?
- Is there an alternative donor site that will have less side effects for me?
- Will I be able to feel the skin of the flap?
- How often do these flaps fail?

Additional questions are listed at the end of this factsheet.

- You should speak to your doctor about how to manage aspects of your lifestyle, such as smoking, drinking alcohol and chronic conditions (e.g. diabetes and obesity) that may increase the risk of complications.
 - If you take blood thinning medication for a heart condition or blood clots (such as Warfarin, Plavix, Aspirin or Pradaxa), make sure your surgeon is aware. Some of these medications need to be stopped more than a week before the operation. Sometimes a short-acting blood thinner (such as Clexane) is used before and after the surgery.
- Talk to your [cancer care team](#) about any likely side effects you can expect following the operation, such as speech, swallowing, breathing and appearance. You may find it useful to talk to a dietitian, speech pathologist or specialist head and neck nurse about these issues.

Visit the [Beyond Five website](#) for further information on the health professionals who may be part of your cancer care team

WHAT TO EXPECT DURING THE OPERATION

Reconstructive surgery may be done at the same time as the primary surgery for the removal of your cancer. Sometimes it is done months or years after the original cancer surgery. Visit the Beyond Five website for further information about the specific surgery you are having for your particular cancer and for questions to ask your doctor.

- **Soft tissue free flap surgery involves:**
 - Finding suitable blood vessels in the neck to join to the flap.
 - Preparing the soft tissue flap from a suitable part of the body; this may include a piece of skin and sometimes muscle, along with its blood vessels. The choice of the donor site depends on the defect needed to be repaired.
 - The soft tissue flap is transferred to the defect in the head or neck region needing repair and the donor site is closed using stitches or sometimes a skin graft.
 - The blood vessels of the soft tissue flap are connected to those in the neck using microvascular surgical techniques.
- The surgery may take several hours; during this time in the operating theatre you will be kept warm and protected from getting pressure sores.

- If the reconstructive surgery involves areas such as the mouth, lower jaw bone, neck or throat, a [tracheotomy](#) (or opening) may be made in the windpipe assist with breathing after the surgery.

WHAT TO EXPECT AFTER THE OPERATION

- After the operation, once you are fully awake, you will be moved to a bed in the hospital or intensive care unit.
- Your treatment team will carefully look after and check the flap by:
 - carefully checking the colour and warmth of the flap
 - using a *Doppler* (special ultrasound) to check the blood flowing through the flap
 - occasionally pricking or scratching the flap to check that it bleeds. Don't worry this will not hurt because the flap does not have any feeling.
 - keeping your head in a neutral (straight position) while you are asleep to prevent the blood vessels from kinking.
- The flap is checked every hour for a few days so that if a clot develops, or there is not enough blood flow, this can be fixed immediately before the flap fails (dies).
- Your anaesthetist and surgical team will give you medicine to help control any pain and nausea after the operation.
- You may have surgical drains from the site of the operation to allow blood or lymphatic fluid to escape and prevent swelling. These will be removed before you go home.
- Your anaesthetist and surgical team will give you medicine to help control any pain and nausea after the operation. You may also have a button to push that delivers strong pain killers (patient controlled analgesia, or PCA), or you may have to ask the nurse for extra pain medication. Ensure you take pain relief medications as prescribed by your doctor and speak to your cancer care team if the pain is not under control, gets worse or if the medication causes any side effects. You may want to download further information about pain management, which is available on the [Beyond Five website](#).

- You may have a drip in your arm to provide fluid and a [feeding tube](#) to help you receive nutrition. The drips and tubes will be removed when they are no longer needed and before you go home.
- You may have a breathing tube in your lower neck to assist you breathing. This is called a tracheostomy and is usually temporary. This will make it difficult to talk, and you may need to write things down that you want to say to people. It is useful to have a pen and paper, mini white board or iPad/tablet in hospital to write down anything you want to say.
- Tracheostomy tubes need to be suctioned regularly to stop them clogging with phlegm and mucus. This will make you cough and it can feel uncomfortable to start with. Visit the [Beyond Five website](#) for further information on [Tracheostomy](#).
- It can be very difficult to sleep in the first two days after surgery because of everything going on. You might feel tired, fatigued, upset and get a bit irritated with people trying to help you. This is normal but it helps to prepare yourself so you don't get too frustrated.
- Most patients stay in hospital for around 1–2 weeks.

POSSIBLE RISKS OF RECONSTRUCTIVE SURGERY USING SOFT TISSUE FREE FLAP

All operations carry some risks such as blood clots, wound infections, bleeding, chest infection, adverse reactions to anaesthetic, and other complications. These risks will be explained by your cancer specialist and anaesthetist.

Your doctor will explain details of the operation, general risks and side effects of the operation, they may recommend:

- stopping blood thinners (e.g. aspirin) before surgery to reduce the risk of bleeding
- a blood thinner (called heparin) may be injected before and after surgery to reduce the risk of blood clots
- antibiotics to reduce to risk of wound infection
- early mobilisation to reduce the risk of blood clots and chest infection
- special stockings to reduce the risk of blood clots.

Free flap reconstructions are big operations but they have become very common after major head and neck surgery. Many hospitals do hundreds of these operations safely every year. There are some specific risks to be aware of:

Clots in the flap (flap failure): The most serious complication of free flap surgery is blockage of the blood vessels that provide blood to the flap to keep it alive. If this happens or is suspected, you will need to return to the operating theatre to unblock the blood vessels. Despite the best efforts, approximately 5% of the soft tissue flaps cannot be saved (salvaged).

Infection: The mouth and throat contains lots of bacteria, which may cause an infection in the wound after the surgery. The surgeon will prescribe antibiotics to prevent this occurring, but if an infection still occurs, it might require opening part of the wound to allow any pus to drain out.

Abnormal opening or fistula: The flap may pull away from the tissue it was stitched to. This makes a hole which may result in fluid (such as saliva) leaking into the wound causing an infection. This can be a very serious complication and might require opening a wound to allow it to drain or another operation to fix the seal.

SIDE EFFECTS AND THEIR MANAGEMENT

As with all operations, there is a chance that reconstructive surgery using soft tissue free flap may lead to a number of side effects. You may not experience all of the side effects. Speak with your doctor if you have any questions or concerns about treatment side effects. Side effects common for soft tissue free flap surgery may include:

- **Nausea:** General anaesthetic may cause nausea. This will settle down soon after the operation and can be treated with medications.
- **Sore throat:** Your throat may be sore initially because of the breathing tube placed during the operation.

Reconstructive surgery is used to help healing, function and your appearance. Despite this some people undergoing reconstructive surgery may also experience:

- **Changes in appearance:** Your appearance may change and it may be hard to accept. Seek support from the cancer care team, and family and friends. Contacting other patients through a [support group](#) may also assist.
- **Changes in eating and speaking:** cancer surgery may affect eating and speaking so it may be useful to have a tablet/portable device or pen and paper to write down what you want to say. The speech pathologist and dietitian will provide any assistance needed to help with your speaking and eating during recovery.

There are also side effects for the surgery to remove your particular cancer, if this is done at the same time as the reconstructive surgery. For these side effects, refer to the information on the website about the particular [surgery](#) you are having for your cancer.

- **Pain management:** Your anaesthetist will give you pain medicine during the operation to keep you comfortable when you wake up, and you may continue on pain medicines to ensure pain is under control. Ensure you take pain relief medications as prescribed by your doctor and speak to your cancer care team if the pain is not under control, gets worse or if the medication causes any side effects. You may want to download further information about [pain management](#), which is available on the [Beyond Five website](#).

BEFORE GOING HOME

- Any particular instructions for [wound care](#) or medications will be provided to you before you go home. You may want to download further information about wound care on the [Beyond Five website](#).
- You may need dressings, especially if you had a skin graft, for several weeks after going home. This is often done by a community nurse.
- Your doctor may prescribe pain medications to help relieve pain following the operation. Ensure you take the pain relief medications as prescribed by your doctor and speak to your cancer care team if the pain is not under control, gets worse or if the medication causes any side effects. You may want to download further information about pain management, which is available on the [Beyond Five website](#).
- You will be assessed by the team involved in your care before you go home and follow-up will be arranged with your surgeon and GP.
- Follow-up may also be arranged with any other allied health professionals that may assist you with supportive care
- Your recovery at home may vary and you should allow time for your body to recover and heal. Regular follow-up helps to assess your progress.

Symptoms to watch for after discharge from hospital

- **Significant swelling:** You will have some swelling after your surgery. This is normal and may last for some weeks or months in varying degrees. However, contact your surgeon, GP or the hospital, if the swelling becomes very noticeable and affects your swallowing or breathing.
- **Difficulty breathing or swallowing:** You should be able to breath normally after your surgery. If you are having difficulty breathing or swallowing, immediately go to hospital emergency department or contact your surgeon.
- **Discharge from the wound:** If your wound becomes red, hot and starts to discharge, these are signs of an infection. Contact your surgeon's office or your GP, as you may need some antibiotics.
- **Fever:** Contact your surgeon of GP if you develop a fever.

FOLLOW-UP CARE

- After your operation, you will continue to have regular follow-up visits with your specialist doctor and cancer care team. Most patients with head and neck cancer will be monitored for five years after surgery, sometimes more.
- Any additional reconstruction, cosmetic procedures or treatments that you may need are planned after discharge. This enables time for you to recover from the initial operation, get results of the pathology that examined the tissue removed at the operation, and make the arrangements for any additional treatment or next steps.

For further information about the operation for cancer and what to expect, you can also refer to [Understanding Surgery: a guide for people with cancer, their families and friends.](#)

QUESTIONS TO ASK YOUR DOCTOR

- What will happen if I decide not to have the surgery?
- When will the cancer surgery be undertaken?
- How much will the surgery cost? Will my health insurance cover it?
- What are the possible side effects of treatment? How can they be prevented or controlled?
- What scar am I likely to expect?
- Will I be able to lead a normal life?
- What follow-up tests will I need after the operation?
- Am I suitable for any clinical trials?
- Who are the health professionals that I will need to see as part of my follow-up care?

You may want to write specific questions here to ask your doctor or cancer care team

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