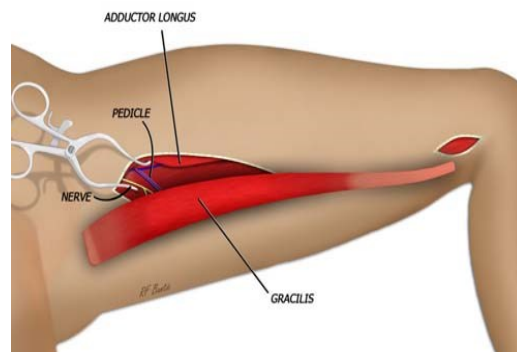
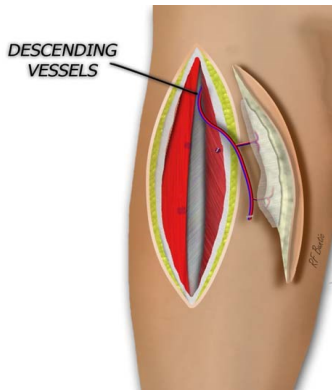


Free Flap Fact Sheet

What is a free flap?

Free flap surgery involves the transfer of a patient's own tissue from a donor site to a recipient site, which is typically the site of a defect. The donor site usually has a distant location with respect to the recipient site. Therefore in order to physically transfer tissue while maintaining its viability that tissue's vascular supply must be divided at the donor site and then reconnected through the creation of anastomosis at the recipient site.

There are **Fasciocutaneous** free flap and **Muscle** free flaps see images below.



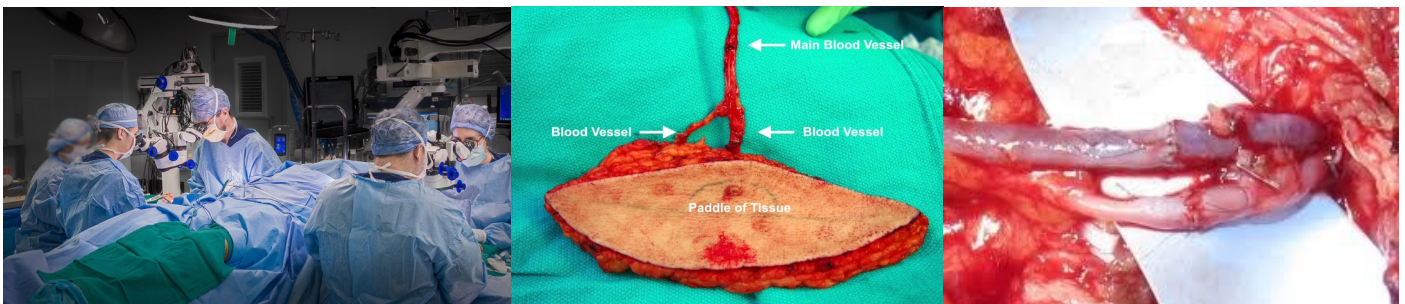
ALT fasciocutaneous free flap

Gracilis Muscle flap

Microsurgery

Microsurgery is a specialised form of surgery performed with the aid of an operation microscope and involves the use of a range of advanced techniques designed for working on very fine structures such as nerves and blood vessels.

In free flaps a donor area with abundant suitable tissue is selected, from which tissue is removed and transferred to the reconstruction site. Blood vessels are then re-connected, establishing blood flow and allowing the tissue to fully integrate within the new location. These sophisticated techniques enable the reconstruction of almost any tissue in the body.



What are the indication for using a free flap?

Trauma, post tumour resection, congenital defects or chronic wounds where a free flap would give the optimum functional result or aesthetic.

- Large defects
- Defects requiring multiple tissue types
- Areas that need freshly vascularised tissue.
- No local options for flap

Caring for a patient with a free flap

When is the most critical for a patient with a free flap?

Free flap vascular problems typically occur during the first 72 hours post op. Free flaps are generally monitored starting immediately postoperatively until at least day 3 and in some cases for additional days depending on the nature of the procedure (e.g. difficulty) and surgeon preference.

Monitoring of a free flap patient ?

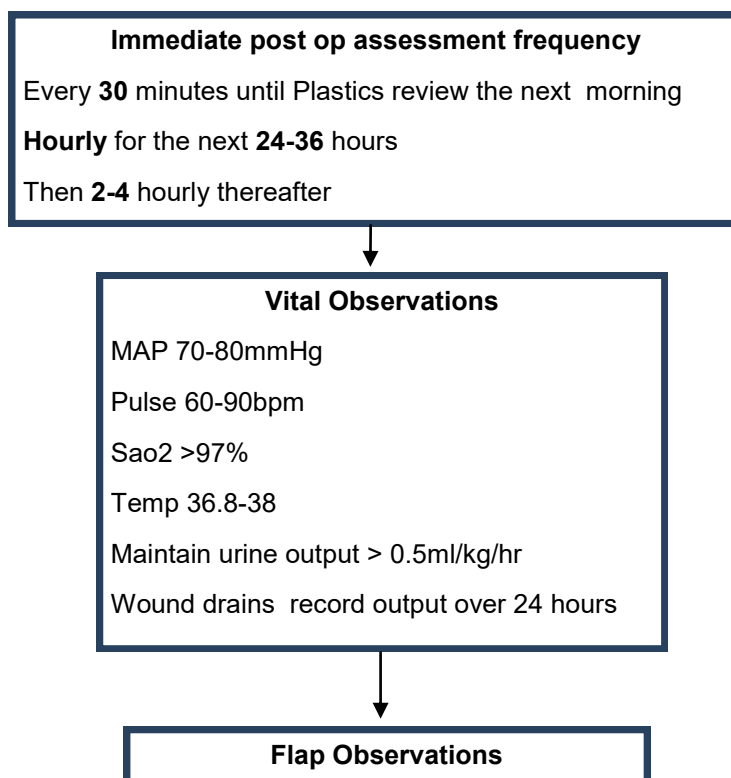
The likelihood of salvaging a failing free flap improves if the delay between the onset of a vascular problem and surgical intervention to correct that problem is reduced excessively. Long delays before intervention, during which the flap is ischemic, can result in partial or total flap loss. For this reason, free flaps are typically monitored frequently (every 30- 60 minutes) especially during the first few days postoperatively to identify vascular compromise as soon as possible so that action can be taken.

Immediately post op assessment frequency

- Every 30 minutes until Plastics Consultant review following day.
- Hourly for the next 24- 36 hours.
- 2- 4 hourly thereafter

What is more important Flap observation or Vital signs?

Both are as equally as important. To complete the flap observation process you need to do a full set of vital observations this includes fluid balance.



On the following page are the page are the flow charts for Fasciocutaneous free flaps and Muscle free flaps.

How vital observations impact on the patients free flap ?

Blood pressure

A low BP and abnormal pulse may indicate hypovolaemia, which indicates inadequate blood supply to the flap.

Pulse

Tachycardia can indicate the patient is in pain. Meaning adrenaline is being released causing vasoconstriction- resulting in poor perfusion of the flap.

Sats

Low sats means the body is having difficulty delivering oxygen to the cells, tissue and organs. This will result in the oxygen supply to the flap will be poor resulting in poor perfusion.

Temperature

A low temperature vasoconstriction will occur reduce loss of body heat in cold temperatures control how blood is distributed throughout your body send more nutrients and oxygen to organs that need them protect your body against blood and fluid loss. Resulting in poor perfusion of the flap.

RR

A raised respiratory rate may indicate pain or anxiety . Meaning adrenaline is being released causing vasoconstriction- resulting in poor perfusion of the flap.

Pain score

It is always important if possible to ask the patient if there in pain or discomfort. As poor pain control will impact on the flap. Ensure you encourage patient to take analgesia regularly- if the patient refuses ensure that there aware of the impact this has on the flap.

Urine output

Decreased urine output can be a result of dehydration. Which means the body is trying to maintain cardiac output and the amount of fluid in the intravascular space decreases the body compensates for the decrease by vasoconstriction- shunting the blood flow away from the skin to the internal organs. Resulting in poor perfusion plus risk of blood clots.

Drain output

Excess drainage can indicate active bleeding.

Position

Always look at the post op instruction. This is important to avoid kinking or tension of vessels and also control swelling.

Flap Observations

Postoperative monitoring of free flaps remains an essential component of care in patients undergoing micro surgical reconstructive surgery. Early recognition of vascular problems and prompt surgical intervention improve the chances for flap salvage.

The flap observations are done through a window in the dressing. This should be enlarged if any if any difficulty accessing.

Do Fasciocutaneous flaps have the same Flap observations as a Muscle flap?

No, on the following page we will take a look at both.

Fasciocutaneous flap observations



Colour

Change in colour is one of the first signs of flap compromise. Observe for any changes in colour:

Dusky/mottled/blue/purple means venous insufficiency.

Pale/ White means compromised arterial supply not enough blood is passing through.

Capillary refill

Apply gentle pressure to the flap for 5 seconds then count in seconds the length of time it takes for perfusion:

Prolonged / no refill (more than 4 seconds) can be symptomatic of arterial problems.

Brisk/ no refill (less than 2 seconds) can be symptomatic of venous insufficiency.

Temperature

A free flap that is perfused normally should exhibit a temperature that is comparable to adjacent non flap areas of the patient:

Cold- indicates inadequate blood supply.

Increased warmth- could indicate an abnormal inflammatory response or haematoma.

Skin texture

This assess the adequacy of blood flow:

Flaccid / Empty flap may indicate poor arterial supply.

Firm / Swollen flap may indicate poor venous return or infection.

Doppler sounds

This is performed by placing the hand held Doppler probe on the site of the new anastomosis, which is usually marked intra-operatively with a marker stitch.

Avoid applying pressure which can lead to vascular occlusion.

Unfortunately Doppler can give false positive readings. Do not trust the Doppler if it disagrees with your clinical findings.

Muscle flap observations



Covered with a Skin graft (SSG)

Muscle free flaps do not have a skin paddle so have to be covered with a skin graft.

Skin grafts placed on muscle free flaps cannot be used as a means of monitoring free flaps because they have not yet undergone revascularisation during the period of time that monitoring is performed.

As you can see in this picture the gracilis flap has been covered with a perforated SSG.

Capillary Refill

This assessment applies only to free flaps with a skin paddle and cannot be performed in muscle free flaps that have been skin grafted.

Different colour assessment

Colour assessment is performed differently. In these cases, it is the colour of the muscle that is assessed, which should be red/pink under normal circumstances.

Dusky/mottled/blue/purple means venous insufficiency.

Pale/ White means compromised arterial supply not enough blood is passing through.

Temperature, Texture and Doppler are the same as Fasciocutaneous flap observations.