



Indications and Guidelines for Flap and Graft Surgery:

Following excision of a skin cancer/skin lesion, most resultant defects can usually be closed directly as an ellipse or variation thereof.

At times, direct closure will be considered inappropriate or inadequate for one of many possible reasons. In these circumstances, the clinician may choose to close the defect with a flap or graft.

Before deciding to close a defect with a flap or graft, the clinician should be able to identify a clear clinical indication for not using direct closure in that circumstance.

Most skin flap closure indications are in those body locations above the neck or distal to the knee or wrist.

When a lesion is locally excised for the purposes of obtaining histological diagnosis, every effort should be made to close the defect directly rather than with a flap or graft repair. The clinician should bear in mind the subsequent treatment the patient may require if melanoma or other malignancy is confirmed.

Listed here are possible specific issues that may steer the clinician away from closure of the defect directly towards closure of the defect using a flap or graft:

- **Size:** Sheer size of the defect may indicate a need for skin flap/graft repair. In this guide, defect diameters are quoted in millimetres (mm) and refer to the shortest axis of the defect following lesion excision. For example, a defect 40 x 25 mm following tumour excision is considered a 25 mm defect.
- **Location:** Size may mitigate against direct closure in any location on the body. The point at which a defect is considered too large for direct closure depends very much on location. A defect as small as 5 mm on the nasal ala may require a flap or graft closure whereas a defect on the trunk of 30 mm and not over a joint can usually be closed directly without compromise to patient outcome.
- **Contour distortion:** Direct closure can lead to distortion that may be cosmetically inferior to a flap repair. For example, large defects on the cheek can lead to a permanent concave distortion that is often considered unacceptable by the patient over the long term. Where the clinician considers this risk problematic a flap closure may be indicated.
- **Asymmetry risk:** Especially on the face, even slight asymmetry between the right and left side can be cosmetically suboptimal. For example, alar rim elevation of 2mm on one side compared to the other can often be quite noticeable and poorly accepted by the patient. Similarly, upper lip elevation of 2mm on one side compared to the other is usually quite noticeable and patients may consider this unacceptable.
- **Z effect:** This refers to defects over joints. A linear scar can contract causing long term functional impairment over a joint. When this is considered a risk, a flap closure that involves a "Z effect" may be considered. These closures have a zig zag type outcome that better accommodates stretch and reduces contracture risk in the long term post operative setting. Flap closures recognised for their "Z effect" include O-S, O-Z and ROM flaps. "Z effect" contrasts with the "Z plasty" which has minimal role in skin cancer surgery other than as an option when considering management of problematic resultant contractures. Usage of a flap with a "Z effect" now may prevent the need to do a "Z plasty" later.
- **Skin wastage:** Skin excised for tumour removal includes three components; the tumour, the margin considered appropriate to excise the tumour and skin "wastage". This refers to the two roughly triangle shaped pieces of skin that are removed at each end of an ellipse. This skin need not be removed for adequate tumour clearance but is removed because that is how one effects an ellipse. A typical elliptical excision can involve removing about twice the area of skin that is actually required to clear a tumour including its necessary margin. This is usually not a bad thing and the term "wastage" is perhaps unnecessarily pejorative. Clinicians effect ellipses all the time without regard to skin wastage. But at

times skin wastage is an issue. Skin may be so tight that the clinician wishes only to remove the tumour and its margin so as the resultant defect is as small as possible. Locations where skin wastage is frequently considered in tumour management include the leg and the scalp and often the hand and foot. Closure techniques that minimise skin wastage include skin grafts, O-S, O-Z, pinwheel and ROM flaps.

- **Cosmetic borders:** These are the lines that border the different cosmetic zones on the face. For example there are cosmetic borders where the cheek meets the nose and where the forehead meets the hairline. As a general rule, clinicians try to avoid unnecessarily crossing cosmetic borders. Scars are frequently suboptimal when these lines are crossed. Often flap design can avoid such issues. Flaps are frequently designed to have lines which lie along cosmetic borders.
- **Cosmetic sub-units:** Within each cosmetic zone on the face there are sub-units that can have their own cosmetic implications. On the nose, for example, the nasal dorsum, nasal tip and nasal ala each have their own cosmetic considerations. Closure of a nasal tip sub-unit defect might involve a flap design that avoids crossing in to the alar sub-unit.
- **Two cosmetic zones:** Sometimes tumours occur at cosmetic borders or effecting the excision of a tumour involves creating a defect which crosses two cosmetic zones. In this situation, the defect should often be regarded as two separate defects and each zone component should be closed with its own approach. For example, a defect involving the lateral nasal side wall as well as the cheek may have the cheek component closed with cheek skin and the nasal defect closed with nose skin. One or other or both components of such a closure may involve a skin flap or graft repair. The design will usually be planned so that no closure component crosses the cosmetic border.
- **Cosmetic lines:** Within cosmetic zones there are often other lines that have an impact on closure design. For example, horizontal wrinkle lines on the forehead can be useful to hide scar lines. Flaps are frequently designed on the forehead to blend in with these lines.
- **Occupation/lifestyle:** Individual patient considerations play a part in the design of defect closure. For example a problematic defect on the dorsum of the hand of a manual worker wanting to return to full work promptly may have clinical differences from a similar defect on another person. In such a circumstance, avoiding tissue wastage and a flap with a Z effect may be considered rather than direct closure.
- **Patient preferences:** Sometimes patients prefer certain surgical approaches over other approaches. When several options are considered reasonable by the clinician, these should be discussed with the patient. Of note, some patients prefer grafts whenever a flap versus graft is considered. Other patients prefer flaps in this situation. This request may relate to their former experiences or advice from others. A problem arises when a patient requests a flap closure when the clinician feels such is not indicated on clinical grounds. If a flap is effected in these circumstances an out of pocket premium might be charged to the patient but a Medicare flap item number should not be charged.
- **Other:** This list is not meant to be exhaustive. Other individual circumstances will have a bearing on decisions regarding closure. There will be other times when direct closure would be considered suboptimal by the clinician. One should bear in mind that in surgery it is best to try to “do it right the first time”. If it is considered an issue may arise later that might require scar or wound revision, consider whether a different approach today might minimise that later risk.

Flap versus graft?

Grafts are generally easier to perform than flaps, other than the simplest of flaps. It is a trap to find yourself closing many defects with grafts simply because your knowledge and experience of a range of flap closures is limited. For those experienced, it would be unlikely to have as many as one defect closed with a graft for every 5 defects closed with skin flaps. Using grafts more frequently than this may indicate a need for greater training in the various skin flap techniques. When a defect can be closed with either a flap or graft, flaps generally produce better cosmetic results. Grafts are generally reserved for when both direct closure and flaps are considered inappropriate.

Flap rates will vary considerably from one doctor to another. Doctors managing defects on all areas of the head and neck including the most difficult defects will be expected to have higher rates of skin flap usage than those who refer some or all of their head and neck tumours/defects. As a corollary, those who accept referrals for head and neck tumours or defects will inevitably be using more flap repairs than other doctors. A doctor managing only the most difficult head and neck tumours may have substantially higher usage of skin flaps and grafts. ACSCM therefore does not consider that there is any “**correct flap rate**” but rather ACSCM is concerned that flaps are used only where indicated and when appropriate to best meeting the patient’s needs.

Planning:

Positive histological margins can unexpectedly occur when excising skin tumours, even when the clinician has planned liberal clinical margins. At times the defect will have been closed with a flap repair. Because this circumstance can happen with any type of flap repair, the clinician should be able to correlate where the skin edge with a positive margin is **now** compared to the location at the time of original defect prior to flap mobilization. The clinician must be able to identify which areas of skin in the new location need further excision to address such positive margins. If the clinician is not confident that original and final margins can be correlated with confidence, the flap surgery should not be carried out.

It is desirable to have photographs or a detailed preoperative diagram of tumours excised that require a flap closure. This assists documentation and can prove valuable when unexpected positive margins are detailed in histology reports. A ruler or other device to determine scale can be useful in clinical photographs.

Ideally, every lesion removed with the intent of wide excision should be orientated prior to placement in the specimen jar for histology. Either a “nick” or suture at a point denoted as 12 o’clock is recommended.

Medicare Item numbers:

ACSCM is frequently asked for guidance with item number choices for random pattern flap closures. ACSCM has considered these requests and offers the following as advice:

In the section regarding skin lesion excisions items, the Medicare Benefits Schedule divides the skin regions into three levels of difficulty: difficult, intermediate, and easy.

“Difficult” tumour excision areas include eyelid, ear, digits, lips, genitalia and nose. When using the flap item numbers, difficult areas also include the neck and hand.

“Intermediate” tumour excision areas include the cheek, forehead and on the lower leg. While such intermediate areas are not defined in the flap section of the schedule, ACSCM considers that these regions, as well as the scalp, areola and foot be considered as “intermediate” for the purposes of the following discussion.

“Easy” tumour excision areas include all other areas of the trunk, the thighs, arms, forearms and upper legs.

45207: should be used for twin advancement or ‘Harry Potter’ type flaps on eyebrow, eyelid and forehead.

45206: should be used for all random pattern flaps involving difficult areas, regardless of size or level of difficulty of the flap.

45200: should be used for small **and** easy flaps on intermediate and easy areas. As a guide, it would be considered most unusual for a defect 10mm or less on an intermediate area to require a flap or graft closure. Further, it would be considered most unusual for a defect 20 mm or less on an easy area to require a flap or graft closure.

45203: Refers to large **or** complicated closures. These are not defined in the Schedule. ACSCM is often asked for guidance on this matter. ACSCM considers it not reasonable to consider a defect large unless it is at least twice the

diameter of the indicative defects described in 45200. That is, on an intermediate area, a large defect would be expected to be at least 20 mm and at least 40 mm on an easy area. Complicated flaps are also not defined in the schedule. ACSCM considers that rhomboid flaps, simple advancement flaps, single transposition flaps, simple rotation flaps, O-Z, O-S and L flaps are not complicated. To be considered complicated, a flap needs to have an added component of difficulty or an added complexity associated with defect location. College considers that the following flaps are more complicated in that they require further degrees of training, expertise, planning, and effecting: Bilobed flaps, Trilobed flaps, ROM flaps, Banner flaps, V-Y flaps, pinwheel flaps and multi-component flaps. Other anatomic issues may lead to a flap being considered complex including proximity to nerves and vessels.

45451: Is used for most full thickness skin grafts.

45439: Is used for most small partial thickness skin grafts

45441: is used for most larger partial thickness skin grafts.

Training / certification: ACSCM has demonstrated that College certification at Diploma level or higher has been shown to train doctors to effectively and safely undertake skin flap/graft surgery as a component of clinical practice.