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## Hair replacement surgery

Hair replacement surgery involves the surgical movement of “permanent” hair along with its roots to an area of bald or balding skin. There are several surgical techniques available but the method most often used today is hair transplantation.

### Patient selection for hair transplantation

Hair transplantation is used predominantly to treat the hereditary balding condition known as androgenetic alopecia ([male pattern hair loss](#) or less often, [female pattern hair loss](#)). Patients with male pattern hair loss tend to have “lifetime” hair on the sides and back of the head, which are used as donor sites in transplantation.

Unfortunately, hair transplantation does not work on [alopecia areata](#) as the transplanted hair will not grow in the area.

### Hair transplantation techniques

Hair transplantation involves removing small pieces of hair and follicles from the “donor area” (usually hair on the back and sides of the head) and relocating them to the bald or thinning area. The transplantation is a long and complex procedure that involves two distinct processes: donor harvesting and the preparation of recipient sites.

#### Donor harvesting

It is important to only harvest “protected” hair follicles to ensure their survival when transplanted. The hair on the back and sides of the head is known as donor dominant or “lifetime” hair and when moved will continue to grow as it would have in its original site.

There are several different techniques used to harvest hair follicles.

Technique	Procedure
Punch harvesting	<ul style="list-style-type: none"> <li>• Popular method up till late 1980’s, early 1990’s</li> <li>• Small hand engine 2- to 6-mm spinning punch that presses into the donor scalp to a determined depth</li> <li>• Punched grafts gently lifted using forceps (taking with it 1mm of fat at the base of follicle)</li> <li>• Donor sites are closed using sutures or skin staples and left to heal</li> </ul>
Excision	<ul style="list-style-type: none"> <li>• Using a scalpel blade an elongated strip is cut from the donor site</li> <li>• Donor sites are closed using sutures or skin staples and left to heal. Scarring is minimal.</li> <li>• Donor tissue dissected into grafts ready for transplantation</li> </ul>
Strip harvesting	<ul style="list-style-type: none"> <li>• Similar to excision except 2 or more scalpel blades are mounted in parallel to cut strips of donor tissue</li> </ul>

Once the donor tissue is harvested, they may be transplanted directly (grafts obtained by punch harvesting) or cut into smaller grafts. The shape and size of the grafts is one of the key factors in the final outcome of hair transplantation. Grafts containing fewer hairs usually provide better results as there is less clumping of hair as it

starts to regrow. Graft shapes and sizes include:

- Punch grafts – round grafts containing about 10–15 hairs. May be further cut in half or quarters to get smaller grafts.
- Mini-grafts – smaller grafts containing 2–4 hairs dissected from excised or strip harvested grafts.
- Micro-grafts – tiny grafts containing 1–2 hairs. Also referred to as follicular unit grafting.
- Slit grafts – thin grafts containing 4–10 hairs.

### Preparation of recipient sites

Several techniques are used to prepare the recipient sites for where grafts are to be placed. Once the sites are prepared small forceps or needles are used to grasp the graft and gently insert it into place.

Technique	Procedure
Single hair and slit grafting	<ul style="list-style-type: none"> <li>• Slits made in the scalp in which grafts are placed using a scalpel or needle</li> <li>• Single hair or micro-grafting is most often used to recreate frontal hairline using this method</li> </ul>
Dilation (modified slit grafting)	<ul style="list-style-type: none"> <li>• Dilators inserted directly into scalp that push aside the scalp to allow insertion of micro-grafts or mini-grafts</li> <li>• Dilators also provide haemostasis (stop bleeding)</li> </ul>
Punch grafting	<ul style="list-style-type: none"> <li>• 1–4 mm diameter punches create a defect where the graft is to be inserted</li> </ul>
Laser-assisted grafting	<ul style="list-style-type: none"> <li>• Recently carbon dioxide laser has been used to create recipient sites.</li> </ul>

## Hair transplantation process

Hair transplantation is done in a doctor's office and can take between 4 to 8 hours depending on the extent of the transplantation.

Traditionally, hair transplantation has been performed in multiple planned sessions that are spaced 3–6 months apart. A typical session might average between 150 and 300 grafts. However, more recently the trend is to place more grafts per session. It is not uncommon for sessions to involve 750 to 2000 grafts. The purported benefit of these “megasessions” is reduced number of hair transplantation visits to achieve hair restoration in a shorter period of time. The possible downfall is reduced overall graft survival where grafts are packed very close together.

The procedure is usually done under [local anaesthetic](#) and does not cause too much discomfort. In most cases, immediately after the hair transplant the hairs fall out of the grafts, and do not regrow for 1–3 months. The donor sites gradually heal to leave slight scarring but this is concealed by “lifetime” hair growing around the site. Patients need to be aware that hair transplantation does not produce an instantaneous head of hair but the results are seen over time.

## Complications of hair transplantation

Hair transplantation is a surgical procedure so complications can and do occur as with any other surgical procedure. Possible complications include

- Bleeding
- Infection
- Numbness
- Pain
- Swelling of the forehead and/or face (expected but can be severe)

- Scarring at donor site or recipient site
- Poor or no growth of grafts
- Unnatural appearance of transplanted hair

Unfortunately, the areas affected by balding are likely to progress.

### Hair transplants

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### Other types of hair replacement surgery

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The following techniques are still performed although they have largely been replaced by hair transplantation.

- [Flaps](#)
- Scalp reduction
- Scalp expansion and scalp extension
- Tissue expansion

These techniques produce a more dramatic and instantaneous result but are becoming less popular because of the following reasons:

- More extensive surgical procedures that usually require general anaesthesia
- Procedure is more painful and post-operative care is much greater
- Severe and visible scarring is common with scalp surgery
- Unnatural looking growing hair, particularly years after the actual surgery

#### Related information

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##### References:

- [Hair Transplantation](#) - emedicine dermatology, the online textbook

##### On DermNet NZ:

- [Hair loss](#)
- [Male pattern hair loss](#)
- [Female pattern hair loss](#)
- [Alopecia areata](#)

##### Other websites:

- [Howstuffworks: How Hair Replacement Works](#)

##### Books about skin diseases:

See the [DermNet NZ bookstore](#)

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DermNet does not provide an on-line consultation service.  
If you have any concerns with your skin or its treatment, see a [dermatologist](#) for advice.

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