



# Mohs Micrographic and PDEMA Surgery

A handbook for patients



**SKIN INSTITUTE**

SKIN CANCER DETECTION & TREATMENT EXPERTS



## Introduction

Mohs micrographic / PDEMA (Peripheral and Deep En Face Margin Assessment) surgery is the most advanced and sophisticated method of removing skin cancers (mainly from the face) and achieves success rates that are higher than any other technique.

The micrographic surgery technique was devised in 1938 by Dr. Frederic Mohs, at the University of Wisconsin. It was initially known as chemosurgery, but is now called Mohs micrographic surgery after its inventor.

Our Mohs micrographic / PDEMA surgeons are specially trained in this technique and perform both the surgery and the reconstruction. Because these methods require the surgeon to have highly specialised training, specific surgical and laboratory facilities and specialised personnel, few medical centres are equipped to offer such treatment.

This booklet attempts to answer some questions you may have as a patient concerning this mode of treating skin cancer. If you have any further questions, please do not hesitate to contact us.

## About Us

Skin Institute was established in 1994 as a specialist centre and focuses on all aspects of clinical dermatology, cosmetic medicine, veins and skin cancer.

Skin Institute is uniquely positioned by having surgeons and clinicians from several specialties who work together to provide the best and most advanced care for patients with skin cancer. Our team includes specialists from the following areas: Dermatology, Facial Plastic Surgery, Head and Neck Surgery, General Surgery, Ear Nose and Throat Surgery, Plastic Surgery and Radiation Oncology. Being the only facility in New Zealand having a broad multidisciplinary team of specialists dealing with skin cancer, we are able to provide a comprehensive and seamless service for all categories of patients and complexities of skin cancers.

Skin Institute has achieved Day Stay Surgery and Procedure Certification. Formal certification demonstrates our commitment to quality, productivity and patient satisfaction. Patients can be confident in our ability to deliver services to a high standard, which consistently meet their requirements.

## Our facilities

We have state-of-the-art consulting rooms and operating theatres. Our theatres are equipped for undertaking surgery under sedation or general anaesthesia if necessary.

All our specialists are on the New Zealand Medical Council Specialist Register and are recognised by insurers.

# Skin Cancer Specialists and Dermatologic Surgeons



## Mr Mark Izzard

MBBS, FRACS (ORL-HNS)  
PDEMA Surgeon, Facial Plastics,  
Reconstruction, Skin Cancer

Mr Mark Izzard is a surgeon specialising in head and neck surgery, facial plastic surgery and reconstruction and his expertise includes the management of all skin cancers and melanoma. Mr Izzard is trained in microsurgery and specialises in reconstruction of the face and nose.



## Mr Rajan Patel

MBChB, MD, FRCS (ORLHNS), FRACS (ORLHNS)  
PDEMA Surgeon, Skin Cancer/Melanoma Surgeon,  
Facial Plastics and Head & Neck Reconstructive Surgeon

Mr Rajan Patel's surgical expertise includes the management of all skin cancers and melanoma, particularly on the face, head and neck. His reconstructive expertise is particularly useful in patients with facial skin cancers and in patients with extensive facial, head or neck cancer.



## Dr Kenneth Wong

BHB, MBChB, FRACP  
Skin Cancer, Dermatologist

Dr Kenneth Wong expertise is in non-surgical and surgical management of skin cancers and is trained in Mohs' micrographic surgery. He also is a dermatologist specialising in all manner of skin disorders (e.g. acne vulgaris, eczema, psoriasis, rosacea).

In addition to our Surgeons and Skin Cancer Doctors, the team includes Pathologists & Nurses who are experienced in diagnosing and caring for patients who have skin cancers at all stages of their diagnosis and treatment, as well as a laboratory technician who quickly and skilfully prepares the tissue for microscopic examination.



## Skin Cancer

Skin cancer doesn't discriminate and it can affect all types of people, men and women, across all ages, ethnicities and communities. Skin cancer occurs when cells begin to grow at an uncontrollable and unpredictable rate. It occurs when DNA damage in skin cells is not able to be repaired. This damage is most often caused by ultraviolet radiation from sunshine or tanning beds that triggers mutations or genetic defects. This in turn causes the skin cells to multiply rapidly and form malignant lesions or tumours.

# Types of skin cancer

There are three main forms of skin cancer:

## Basal Cell Carcinoma (BCC)

Basal Cell Carcinoma is also known as BCC or rodent ulcer. Basal Cell Carcinoma is the most common type of cancer in humans and is particularly prevalent in Australia and New Zealand. This form of skin cancer is very rarely a threat to life.

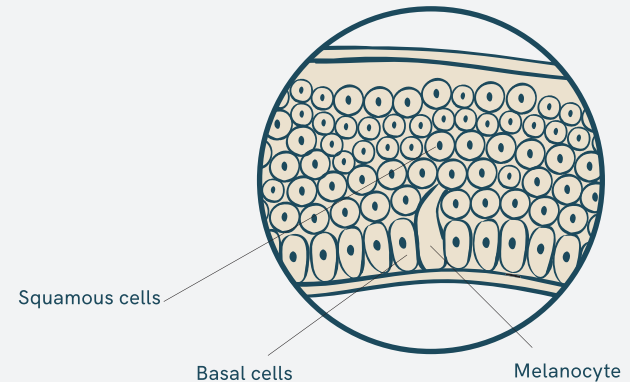
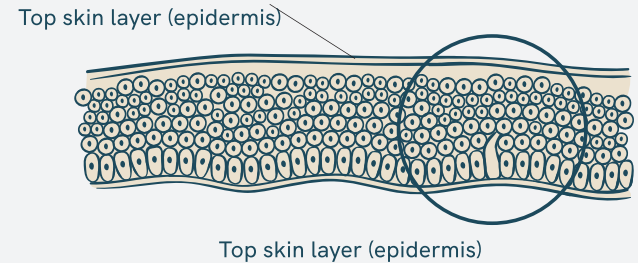
## Squamous Cell Carcinoma (SCC)

Squamous Cell Carcinoma is a common type of skin cancer. It is derived from squamous cells, the flat cells that make up the outside layers of the skin (the epidermis). These cells are keratinising i.e. they produce keratin, the horny protein that makes up skin, hair and nails.

Invasive SCC refers to cancer cells that have grown into the deeper layers of the skin (the dermis). On rare occasions SCC can metastasize (spread to distant tissues) and may prove fatal.

## Malignant Melanoma (MM)

Malignant Melanoma is a potentially serious type of skin cancer. It is due to uncontrolled growth of pigment cells, called melanocytes. These refer to the cell types in the top skin layer (the epidermis) from which these cancers are derived.



- Squamous cells give rise to Squamous Cell Carcinoma
- Basal cells give rise to Basal Cell Carcinoma
- Melanocytes give rise to Malignant Melanoma

## Is it dangerous?

New Zealand has one of the highest rates of skin cancer in the world. Every year, almost 90,000 people are diagnosed with skin cancer, making it the most common cancer. Melanoma is the deadliest form of skin cancer and over 300 people die from it each year. Many deaths could be prevented by earlier diagnosis and management.

The most common types of skin cancer are Basal Cell Carcinoma (BCC) and Squamous Cell Carcinoma (SCC). Both types enlarge from the point where they first occur and usually do not spread (metastasize) to distant parts of the body. If not completely removed, both will invade and destroy structures in their paths. Compared to other forms of cancer, these types of skin cancer can be recognised in their early stages and are therefore easily cured. Malignant Melanoma, on the other hand, may be life threatening if not treated early. It usually appears as a brownish-black spot or bump on the skin that enlarges and sometimes bleeds. Sometimes melanomas arise in moles that have been present for many years.

## What causes skin cancer?

The cause of skin cancer, like other forms of cancer, is not completely known. Excessive exposure to sunlight is the single most important factor associated with the development of skin cancers. Consequently, skin cancers most commonly develop on the face and the arms, the most sun-exposed parts of the body. Fair-skinned individuals develop skin cancer more frequently than dark-skinned individuals. Sunburns, especially in childhood, have been linked closely with BCC, whereas cumulative sun exposure over many years is associated with the development of SCC. The role of sunlight exposure in melanoma is less clear and genetic predisposition is perhaps the most important risk factor. Other possible causes of skin cancer include X-rays, trauma, virus, infection, smoking and certain chemicals.

## How does skin cancer start?

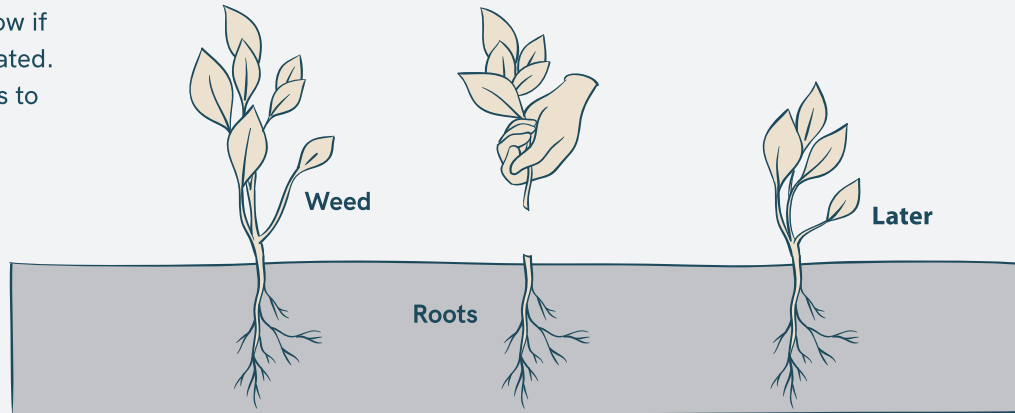
Skin cancers begin in the uppermost layer of the skin (the epidermis) and grow to the sides on the surface of the skin and downward, below the skin surface, with root-like extensions. This is comparable to the roots of a weed (see illustration on next page).

## How does skin cancer grow?

Skin cancer starts growing under the surface of your skin and its root-like extensions cannot be seen with the naked eye. Therefore, what is apparent to the naked eye on the surface of the skin (in the form of a mole or lesion) may actually be only the visible "tip of the iceberg."



A weed will regrow if roots are not treated. The same applies to skin cancer.



## Skin cancer treatment

In addition to Mohs micrographic / PDEMA surgery, there are several methods of treating skin cancer including excision (surgical removal) and immediate wound closure (suturing or sewing), curettage and electrodesiccation (scraping with a curette and burning with an electric needle), radiotherapy (X-ray), cryosurgery (freezing), topical anti-cancer agents and Photodynamic Therapy (PDT).

The method of treatment selected depends on several factors, such as the location of the cancer, its size and previous therapies used. Many patients ask about laser treatment of skin cancers. Laser treatment is simply another method to burn off skin cancers, similar to electrodesiccation mentioned previously.

The chart over the page lists the points for and against the different skin cancer treatment methods. Except for Mohs micrographic / PDEMA surgery, all other methods of skin cancer treatments require guessing how wide and deep to treat. In Mohs micrographic / PDEMA surgery the removed tissue is examined under the microscope and the tumour is mapped so that guessing the extent of the tumour is eliminated.

## Different skin cancer treatment methods

Treatment method	Points for	Points against
Mohs micrographic / PDEMA surgery	<ul style="list-style-type: none"> <li>▪ Highest cure rate</li> <li>▪ Smallest scar</li> <li>▪ All tissue examined</li> </ul>	<ul style="list-style-type: none"> <li>▪ Time consuming</li> <li>▪ Expensive</li> </ul>
Excision with closure	<ul style="list-style-type: none"> <li>▪ Fast</li> </ul>	<ul style="list-style-type: none"> <li>▪ May not remove all cancer, especially if treated before unsuccessfully</li> <li>▪ Does not examine all specimen margins</li> </ul>
Excision and closure with frozen sections in operating room	<ul style="list-style-type: none"> <li>▪ Examines some tissue at surgery</li> </ul>	<ul style="list-style-type: none"> <li>▪ Does not examine all tissue removed</li> <li>▪ Expensive</li> </ul>
Curettage and electrodesiccation	<ul style="list-style-type: none"> <li>▪ Fast</li> <li>▪ Inexpensive</li> </ul>	<ul style="list-style-type: none"> <li>▪ Likely to leave tumour if on face or if previously treated</li> </ul>
Radiotherapy (X-rays)	<ul style="list-style-type: none"> <li>▪ Non-surgical</li> </ul>	<ul style="list-style-type: none"> <li>▪ May scar</li> <li>▪ Requires 15-20 treatment sessions</li> <li>▪ Expensive</li> </ul>
Cryosurgery	<ul style="list-style-type: none"> <li>▪ Fast</li> <li>▪ Inexpensive</li> </ul>	<ul style="list-style-type: none"> <li>▪ May not treat all of tumour</li> <li>▪ May scar</li> </ul>
Laser	<ul style="list-style-type: none"> <li>▪ "Hi-tech" deeper roots</li> <li>▪ Expensive</li> </ul>	<ul style="list-style-type: none"> <li>▪ Superficial and unlikely to cure</li> </ul>
Topical Therapy (Efudix, Aldara)	<ul style="list-style-type: none"> <li>▪ Good cosmetic result</li> <li>▪ Inexpensive</li> </ul>	<ul style="list-style-type: none"> <li>▪ Unlikely to cure cancer if large or if deeper cancer roots</li> </ul>
Photodynamic Therapy (PDT)	<ul style="list-style-type: none"> <li>▪ Excellent cosmetic outcome</li> </ul>	<ul style="list-style-type: none"> <li>▪ May not cure cancer if large or if deeper cancer roots</li> <li>▪ Expensive</li> </ul>



## Mohs micrographic / PDEMA surgery

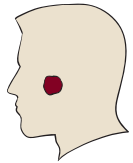
Mohs micrographic / PDEMA surgery involves the surgical excision of cancer containing tissue and the systematic microscopic examination of all cut surfaces at the time of the operation. It is a highly specialised procedure for the total removal of skin cancers.

Mohs micrographic / PDEMA surgery is the best method of removing skin cancer and ensuring at the time of the procedure that the skin cancer is completely excised. Mohs micrographic / PDEMA surgery has the highest cure rates for skin cancer and optimises the end cosmetic result.

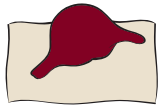
Common treatment procedures for skin cancer can often prove ineffective because they rely on the human eye to determine the extent of the cancer. In an effort to preserve healthy tissue, too little tissue may be removed, resulting in recurrence of the cancer. If the surgeon is over cautious, more healthy tissue than necessary may be removed, causing excessive scarring or disfigurement.

# How is Mohs micrographic / PDEMA surgery performed?

Mohs micrographic / PDEMA surgery is performed as a day stay procedure, usually under local anaesthetic. Sedation or general anaesthesia can be provided to patients requiring more extensive surgery. This method involves six separate steps:

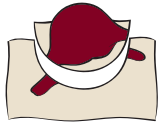


Visible skin cancer on left cheek.



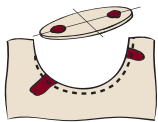
The skin cancer roots may extend beyond the visible area of the tumour. These roots must be removed otherwise the cancer will recur.

1



**Step 1:** The visible tumour is removed with a skin scraper (a curette).

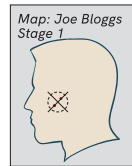
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**Step 2:** A thin underlying layer of tissue is then surgically removed. This is called the 'First Stage'. The surgeon then divides this layer into colour coded sections and marks the skin on the patient to reference the source of the sections.

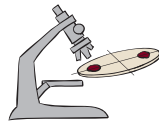
■ = cancer

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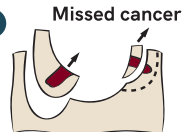
**Step 3:** A matching map of the surgical site is then drawn, schematically showing the source of the sections.

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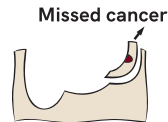
**Step 4:** The layer of tissue is examined under microscope. If cancer is found on microscopic examination, its location is marked on the reference map and the surgeon can return to this precise location and remove the cancerous tissue. Another thin layer of tissue is removed ('Second Stage') and microscopically examined. If cancer is still found then the surgeon again marks the location and with precise accuracy can remove the cancerous tissue.

5



**Step 5 and 6:** This careful and systematic process is repeated until no further cancerous tissue remains. In this case, the left hand root has been removed completely but a further stage ('Third Stage') is required to remove the right hand root.

6



## Indications

Mohs micrographic / PDEMA surgery is used primarily to treat BCCs and SCCs, but can also be used to treat less common tumours, including melanoma. Mohs micrographic / PDEMA surgery is indicated when:

- The cancer was treated previously and recurred.
- Scar tissue exists in the area of the cancer.
- The cancer is in a difficult area where it is important to preserve healthy tissue for a maximum functional and cosmetic result, such as the eyelids, nose, ears and lips.
- The cancer is large.
- The edges of the cancer cannot be clearly defined.
- The cancer grows rapidly or uncontrollably.

## How effective is Mohs micrographic / PDEMA surgery?

Using the Mohs micrographic / PDEMA surgical technique, the cure rate is very high, often 95% to 98%, even if other forms of treatment have failed. This is the highest cure rate among all treatments available for treating skin cancer.

## What are the advantages of Mohs micrographic / PDEMA surgery?

- Mohs micrographic / PDEMA surgery has the highest cure rate for skin cancer.
- It is especially suited for poorly defined tumours, recurrent tumours and tumours known to behave in an aggressive manner.
- It provides the surgeon with confidence that the tumour is completely removed prior to closure of the wound.
- Less adjacent normal skin is sacrificed, resulting in smaller wounds and therefore smaller scars.

## What are the disadvantages?

- Mohs micrographic / PDEMA surgery is more time consuming than routine surgery.
- It involves more staff and equipment and because it takes longer to perform, Mohs micrographic / PDEMA surgery is more expensive than routine surgery.

## How does Mohs micrographic / PDEMA surgery differ from cancer removal in the operating room with 'frozen sections'?

Some doctors who are not trained in Mohs micrographic / PDEMA surgery remove skin cancers and have a pathologist check the margins of excision by doing frozen sections at the time of surgery. This is not the same as Mohs micrographic / PDEMA surgery. In such cases the tissue is processed by a pathologist who samples representative radial sections of the excised tissue, rather than processing the entire surgical margin as in Mohs micrographic / PDEMA surgery. This is analogous to examining a few slices in a loaf of bread rather than examining the whole crust of the loaf. In Mohs micrographic / PDEMA surgery, the entire sides and under-surface of the excised tissue is examined for possible tumour and it is possible to know exactly where any potential residual tissue remains.

## Will my insurance cover me for Mohs micrographic/ PDEMA surgery?

Some health insurance policies cover the total cost of Mohs micrographic / PDEMA surgery. Most cover at least part of it. Each policy is different. Please check with our patient care co-ordinator if you have any questions regarding costs and insurance forms.



## Pre-operative consultation

The pre-operative consultation gives the physician an opportunity to examine your skin cancer, take a pertinent history and determine whether the technique of Mohs micrographic / PDEMA surgery is the most suitable way of treating your skin cancer. Also, it gives you, the patient, the opportunity to learn about the procedure. At the time of the pre-operative consultation, we need to know about your medications, allergies and any current medical problems. Also, we need to know if you have any artificial joints, pacemakers or heart valves. Every skin cancer is different and because of the length of the treatment, careful scheduling is necessary. A suitable date for surgery that is mutually acceptable will be arranged as soon as possible.

Usually a small biopsy of the tumour will be obtained to confirm the type of tumour present and its pattern of growth. All patients are photographed before and after surgery and after healing. These photographs become part of your medical record and may be used for teaching or research purposes.

# Pre-operative instructions for Mohs micrographic/PDEMA surgery under local anaesthetic

- We advise you to have a light breakfast before you arrive, and take any prescribed medication as usual. If you are taking Aspirin, which has not been prescribed by your doctor for a medical reason, please stop this one (1) week prior to your procedure. If you have been prescribed Aspirin (Cartia) by your doctor for medical reasons or if you are taking Warfarin, please continue taking it as usual. Your surgeon will indicate if they wish you to stop this medication prior to your procedure.
- We suggest you wear loose-fitting, comfortable clothing and bring a warm jumper with you. Leave any valuables at home. Bring some reading material along.
- Due to the unpredictable nature of the surgery, you may be required for the whole day.
- Some of the operation sites or 'defects', due to their size and/or location, may require a complicated closure such as a skin graft or flap. This cannot always be predicted prior to surgery. Your surgeon will discuss this with you as your surgery progresses.
- Most people need to return the following day for a wound check and dressing change with the practice nurse. Sutures are usually removed 5-7 days later. You will be given these appointment times after your surgery. You will also be required to attend a 6 week follow-up appointment and another one usually 3-6 months later.
- In most cases, the wound has a bulky pressure dressing applied after the surgery and this needs to stay in place for 24 hours. You will be given full instructions on how to care for your wound on the day of surgery, including a written aftercare instruction sheet.
- You may have some bruising and swelling after surgery, and many people have the following day off work. The length of down-time depends on how extensive your surgery is.
- Oral antibiotics may be prescribed to reduce the risk of developing a wound infection. Please advise us if you have any allergies.
- If you are feeling particularly anxious please inform the nurse. There is a pre-medication available to help you feel more relaxed and sleepy. If you think you are going to require this, please notify us. You will need to have someone drive you home if you are given this medication.
- Please be aware that processing of the slides is a lengthy procedure and you will spend much of your time at the clinic waiting for your results. We will advise you of how things are progressing throughout the day and feel free to speak to the nurse at any time if you have any questions.



## Day of Surgery

When you arrive at the clinic, you will be admitted by one of the nurses. You will be required to read and sign a consent form prior to your surgery taking place. The nurse will take your completed Medical Questionnaire that you should have been given at the time of booking your surgery.

You will be required to have a set of photographs taken of you before your surgery. Photographs will also be taken during and after your surgery. These photographs are kept in your clinical file. Please feel free to ask any questions at this time.

## Procedure

Appointments for surgery are usually scheduled early in the day. This allows us to continue the surgical steps throughout the entire day, if necessary. The nurse will escort you to an operating room where a physician or nurse will review your health history. You will then be injected with a local anaesthetic, usually Xylocaine, around the skin cancer to numb the skin and prevent discomfort during surgery.

The next step is for the surgeon to remove a thin layer of tissue involved by the cancer. After this tissue has been carefully removed, bleeding is stopped by a process called cautery. You may feel a slight amount of heat in the wound. Before you leave the operating room, the nurse will apply a dressing to your wound and by the time you get to the waiting room, the removed tissue will be in the laboratory where it is prepared for microscopic examination.

The most difficult part of the procedure is waiting for the results of the surgery. It usually takes between one to two hours to prepare the slides, although occasionally it may take longer. While you are waiting, you may leave the clinic as long as you can be contacted by mobile phone.

Please do not consume alcoholic beverages. Alcohol dilates blood vessels and may promote bleeding.

If examination of the slides reveals that your tissue still contains skin cancer cells, the procedure will be repeated as soon as possible. Several surgical excisions and microscopic examinations may have to be done in one day and occasionally it is necessary to have a patient return the on another day for additional surgery to clear the skin cancer or close the wound.

The Mohs micrographic / PDEMA surgery process includes a specific sequence of surgery and pathological investigation. The surgeon will trace the path of the tumour using two key tools:

- A map of the surgical site
- A microscope

Once the visible tumour and a thin underlying layer of tissue, called the 'first stage' is removed, the specimen will be sent to our on-site laboratory where it will be prepared on to slides to enable them to be examined under the microscope. The prepared slides are examined for evidence of any remaining tumour.

If any of the sections contain cancer cells, the surgeon will:

- Return to the specific area of the tumour site as indicated by the map.
- Remove another thin layer of tissue only from the specific area within each section where cancer cells were detected.
- Microscopically examine the newly removed tissue for additional cancer cells.

If microscopic analysis still shows evidence of cancer, the process continues, layer by layer, until the cancer is completely removed.

## How long does it take?

As the complete removal of a skin cancer is determined by how many surgical stages are required, it is hard to predict the length of time you may be at the clinic. Therefore, it is recommended that you plan for the entire day.

## Will I need to be hospitalised?

Virtually all patients are able to go home after surgery. Hospitalisation is only required if extensive surgery is required. This will be discussed with you if applicable.

## Will I have pain after surgery?

Most patients do not complain of pain. However, pain is an individual experience and if you are uncomfortable, we recommend taking Panadol / Panadeine tablets as directed. Avoid Aspirin-containing medications as these may enhance bleeding.

## Should someone come with me on the day of surgery?

### Do I need someone to drive me home?

Yes. It is recommended that you have someone drive you to and from the clinic – and it may be pleasant to have company while sitting in the waiting room. It is a good idea to bring a book or magazine with you on the day of surgery. The procedure may take a full day, most of which you will spend in the waiting room. We will provide you with refreshments and light snacks.

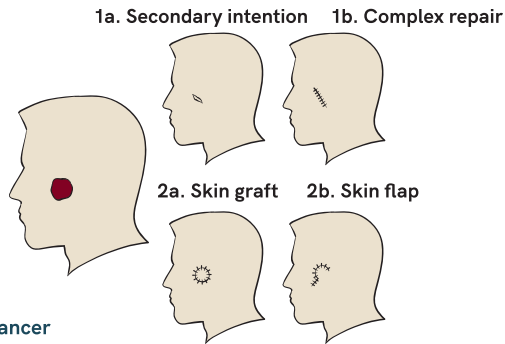


## Wound repair and reconstruction

When we have determined that the skin cancer has been completely removed, a decision is made about what to do with the wound created by the surgery. Usually there are two choices: (1) to let the wound heal by itself (secondary intention) or (2) to repair (close) the wound with sutures (either by bringing the wound edges together or with a skin flap or skin graft). The following chart compares these two methods. We will discuss with you which of these choices will be best in your individual case.

# What are the best methods of wound repair?

The best method of managing the wound resulting from surgery is determined after the cancer is completely removed. When the final defect is known, management is individualised to achieve the best result and to preserve functional capabilities and maximise aesthetics. A small wound may be allowed to heal on its own (secondary intention), or the wound may be closed as a direct closure (complex repair), a skin graft or a flap reconstruction. Your surgeon will discuss this with you at the time of your surgery.



- 1a. **Secondary intention** is when a wound is allowed to heal on its own.
- 1b. **Complex closure repair** involves bringing the wound edges together and trimming excess skin.
- 2a. A **skin graft** involves taking a piece of tissue the same size as the wound from elsewhere on the body (usually from behind the ear or over the collarbone) and suturing it onto the wound.
- 2b. A **skin flap** involves moving skin nearby the wound into the wound by a series of complex incisions.

## For and Against

	Points for	Points against
<b>Natural healing</b> (secondary intention)	<ul style="list-style-type: none"> <li>▪ No further surgery</li> <li>▪ Less expensive</li> </ul>	<ul style="list-style-type: none"> <li>▪ Takes 4-8 weeks to heal</li> <li>▪ Noticeable scar may result</li> </ul>

	Points for	Points against
<b>Repair with sutures</b> (stitches)	<ul style="list-style-type: none"> <li>▪ Fast healing (usually 1 week)</li> <li>▪ May have less noticeable scarring</li> </ul>	<ul style="list-style-type: none"> <li>▪ Further surgery required</li> <li>▪ More expensive</li> </ul>

## If the wound is repaired, what is the procedure following my surgery?

If we close the wound with sutures, you will need to keep the wound clean and dry for 24 hours. After that, you may get the wound wet. In most cases, you will need to visit the clinic the next day for a wound check and dressing change.

After your surgery if you notice a foul smelling fluid coming from your wound, call our clinic or your surgeon surgeon (if it is after hours) immediately. This may mean that your wound has become infected.

You may then be prescribed an antibiotic if you were not prescribed one at the time of your surgery. If you were prescribed an antibiotic at the time of your surgery, it may need to be changed to a different one.

## If the wound is allowed to heal by itself, what is the procedure?

If the wound is allowed to heal by itself (secondary intention), it usually heals in 4-8 weeks. You will need to keep the wound dry. You are usually expected to return to the clinic the next day to have your dressing changed. The dressing keeps the wound moist and this helps the wound heal faster with less of a scar. Leaving a wound open to the air will cause a crust to form that will delay healing and may cause more of a scar. The nurse will instruct you on how to perform dressing changes and will give you a written instruction sheet.

## What should I do if the wound is red or itchy?

All wounds normally develop a small, surrounding halo of redness that disappears gradually. Severe itching with extensive redness may indicate an allergy to the ointment used to dress the wound or a reaction to adhesive tape. You should call our clinic if this develops. It is important to not let the wound(s) become dry.

## What happens after the wound has healed?

You may experience a sensation of tightness (or drawing) as the wound heals, but this is normal. After several months, you will feel this less and less. Sometimes, tumours involve nerves and it may take up to a year, or even two, before feeling returns to normal, or near normal. Sometimes the area stays numb permanently. Only time will tell.

The new skin that grows over the wound contains many more blood vessels than the skin that was removed. The new blood vessels result in a red scar and the area may be sensitive to temperature changes (such as cold air). This sensitivity improves with time and the redness gradually fades, but if you are having a lot of discomfort, try to avoid extremes of temperature.

Patients frequently experience itching after their wound has healed because the new skin that covers the wound does not contain as many oil glands as previously existed. Scars may also itch. Vaseline petroleum jelly will help relieve the itching. If this problem is particularly bothersome, an injection of a steroid may be helpful.

## **Will the surgery leave a scar?**

Yes – all forms of surgery will leave a scar of some kind. However, the Mohs micrographic / PDEMA surgical procedure allows for the scarring to be as minimal as possible.

## **How can I improve my scar?**

Slight elevation of scars or lumpiness (usually from sutures) can be improved by firm pressure massage repeated several times a day. This should be commenced by you approximately 4 weeks after your surgery. It is also recommended that your wound is strapped for 4-6 weeks after your surgery. This will be explained to you at your follow-up appointment. You will be required to attend a 6 week follow-up appointment with your surgeon. It will be at this time that your surgeon will discuss any necessary management of your scar.

## **How often must I return for follow-up once the wound has healed?**

Studies have shown that once you develop a skin cancer, there is a high risk you will develop others in the years ahead. We recommend that you be seen at least once a year for the rest of your life by your dermatologist, head & neck specialist or referring clinician so they may determine whether you have developed any new skin cancers.

## **Are there any complications that may occur?**

### **Nerve damage**

Rarely, nerves are severed while removing your skin cancer. Nerves may be damaged during surgery, especially if your tumour is near, wraps around, or invades nerves. We will discuss with you before surgery if we feel this is a likely situation in your case. Nerve damage may result in loss of muscle function or sensation. Loss of muscle function is rare after Mohs micrographic / PDEMA surgery. Loss of sensation is more common, however this usually gets better with time.

### **Bleeding**

Occasionally there may be bleeding following your surgery. If this occurs, you will need to apply firm pressure to your wound continuously for 10 minutes. Do not lift the bandage to check on the bleeding. If the bleeding persists, please contact the clinic or your surgeon if after hours. Your surgeon's mobile number will be given to you at the time of being discharged. Alcoholic beverages or heavy exercise may bring about bleeding after surgery so these should be avoided.

### **Infection**

Infection is unusual. If it does occur, the wound will be very red and tender and pus may be present.

### **Swelling**

Tissue swelling around wounds is very common and will resolve with time, usually a few days. Eyelid swelling can be particularly extensive for surgery done around or near the eye area, nose or forehead. Using two pillows to rest your head when lying down may minimise this. Ice or cold compresses may also help to minimise swelling.

## **What are some tips to help avoid complications?**

Sometimes complications are inevitable. However, we have found that there are three things you can do to help your wound to heal:

1. Put the wound at rest. Stress on wounds promotes bleeding and scarring. In addition, wounds under stress take longer to heal. Therefore, avoid heavy exercise, bending or lifting for several weeks after surgery.
2. Keep the wound covered. A moist wound heals faster with less scarring than a wound uncovered and exposed to air.
3. Avoid alcohol for 48 hours and do not smoke for 2 weeks before and 2 weeks after the surgery.

## **Later on, must I avoid the sun?**

No, not entirely. We do not think that sunshine will be harmful to you as long as you provide yourself with adequate protection, avoid burning and use discretion.

As mentioned earlier, sunlight is probably the main cause of skin cancer and patients who have developed one skin cancer often will develop more at a later time. Therefore, in the future, when you go into the sun, we recommend that you liberally apply a sunscreen (with SPF 50 or greater) to all exposed areas, including the tops of the ears.

We recommend using broad-spectrum sunscreens that provide both UVA and UVB protection. It is best to apply the sunscreen about 15 to 30 minutes before going outdoors. Be sure to reapply it liberally after swimming or exercising since most sunscreens wash off with water or perspiration.

In addition to a sunscreen, we recommend that you wear a broad-brimmed hat and wear clothing to further protect you from the sun. Remember, it may not be necessary for you to restrict your outdoor activities or to change your lifestyle if you follow this advice.





## Definitions

### Cancer

A general term for many different diseases characterised by abnormal and uncontrolled growth of cells. The resulting mass, or malignant tumour, can invade and destroy surrounding normal tissues. In addition, certain types of cancer can spread (metastasize) through the blood to start new cancers in other parts of the body.

### Malignant Tumour

A growth containing cancer cells (see definition of cancer).

### Benign Tumour

A non-cancerous growth that does not invade nearby tissue or spread to other parts of the body.

### Metastasize

The spread of cancer through the blood or lymph vessels from one part of the body to another.

### Biopsy

The removal and microscopic examination of tissue from the skin for purpose of diagnosis.



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Note: Not all clinics offer Mohs micrographic / PDEMA surgery. September 2024.



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