PROCEDURE

Mohs micrographic surgery

Mohs surgery removes skin cancer in thin layers while checking each layer for cancer cells.

PURPOSE
Remove skin cancer while preserving as much healthy skin as possible

PROCEDURE TYPE
Therapeutic surgery with immediate microscopic margin examination

WHERE IT IS DONE
Outpatient clinic or operating theatre

ANAESTHESIA
Local

HOW LONG IT TAKES
About 2 to 6 hours; complex cases may take longer

PREPARATION
Usually no fasting; change medicines only if specifically instructed

RECOVERY
Same day; no driving after sedatives or vision-limiting repairs

MAIN RISKS
Bleeding, infection, scarring, wound-healing problems

RESULTS
Margin results during surgery; additional pathology may take days

Overview

Mohs micrographic surgery is a precise way to remove certain skin cancers. The surgeon removes the visible cancer and a very thin layer of surrounding tissue. That layer is mapped, prepared and examined under a microscope while you wait.

If cancer cells are found at an edge or deep margin, the surgeon removes another thin layer only from that area. This process continues until the examined margins are clear.

Mohs surgery aims to remove the cancer while saving as much healthy skin as possible. This can be especially important on the face, ears, hands, genitals and other areas where preserving function or appearance matters.

The procedure is usually performed in one visit using local anaesthetic. Local anaesthetic numbs the area while you remain awake.

Why the procedure is performed

Mohs surgery is most often used for basal cell carcinoma and squamous cell carcinoma, two common forms of skin cancer. It may also be used for selected uncommon skin cancers. Some centres use specialised Mohs techniques for certain early melanomas.

Your healthcare team may recommend it when a skin cancer:

Checking the entire surgical edge during the procedure gives the surgeon detailed information about where cancer cells remain.

- Is on the face, ears, scalp, neck, hands, feet or genitals
- Has poorly defined edges
- Is large, fast-growing or has high-risk microscopic features
- Has returned after earlier treatment
- Was not completely removed by a previous procedure
- Is in an area with scar tissue
- Occurs in someone with a weakened immune system

Who should and should not have it

Mohs surgery may be suitable when a high cure rate and maximum preservation of healthy tissue are priorities. Your specific cancer type, size, location, previous treatment and pathology results all affect the decision.

It is not automatically the best choice for every skin cancer. A small, low-risk cancer on the trunk or limb may be treated effectively with standard surgical removal. Some superficial cancers can be treated without surgery.

Mohs may be avoided or delayed if:

Blood-thinning medicines do not automatically prevent Mohs surgery. Stopping them without medical advice can cause harm. The surgeon and the clinician who manages these medicines should decide whether any change is needed.

If a large or complex repair is expected, Mohs removal may be coordinated with a plastic, eye, ear, nose and throat, or other specialist surgeon.

- The diagnosis has not been confirmed and more testing is needed
- The cancer cannot be assessed reliably using the available Mohs technique

- Another treatment is more appropriate for the cancer type or location
- An infection near the planned surgical area needs treatment first
- A medical problem needs stabilising before a lengthy outpatient procedure
- You cannot safely receive the planned anaesthetic

How to prepare

Follow the treating facility's own instructions first, because they take priority over general advice.

Mohs surgery usually does not require fasting because it is commonly performed with local anaesthetic. Eat and drink as instructed by the facility. If sedation or a separate reconstruction under deeper anaesthesia is planned, you may need to stop eating and drinking beforehand.

Give the team a current list of medicines, supplements and allergies. Include aspirin, anticoagulants and antiplatelet medicines, which reduce blood clotting. Do not stop these unless the clinician responsible for your care specifically tells you to.

You may be asked to:

Tell the facility if you become unwell or develop irritated or infected skin near the planned site.

- Wash normally and leave the treatment area free of makeup or skin products
- Wear comfortable clothing that allows access to the area
- Bring food, water, medicines and something to pass the waiting time
- Arrange transport if you will receive a sedative or have a repair affecting vision or movement

What happens during the procedure

You will be positioned so the surgeon can reach the cancer. The area is cleaned, and local anaesthetic is injected. The injection may sting briefly, but the area should then feel numb. You may notice pressure or movement without sharp pain.

The surgeon removes the visible cancer and a thin layer of nearby tissue. A temporary dressing is placed over the wound.

The removed tissue is marked to show its exact position, divided into sections and processed in an on-site laboratory. The surgeon examines the edges and underside under a microscope. Preparing and checking each layer often takes longer than removing it.

If cancer cells remain, the surgeon uses the map to remove another thin layer from the exact area involved. More local anaesthetic can be given if needed. These stages continue until no cancer cells are seen at the examined margins.

The wound may then be:

The repair method is based on the wound's size, depth and location, as well as your health and preferences.

- Left to heal naturally
- Closed with stitches
- Covered with a skin graft
- Repaired using a flap of nearby skin
- Referred for reconstruction by another surgeon

Recovery and what to expect afterward

Pain is usually mild to moderate once the numbness wears off. Tightness, tenderness, swelling and bruising can occur, especially around the eyes or forehead. Follow the facility's advice about pain relief and cold packs.

You can usually eat and drink normally after a procedure performed with local anaesthetic. Follow different instructions if you had sedation or another anaesthetic.

Limit exercise, bending, heavy lifting and activities that pull on the wound for the period specified by your surgeon. Keep the dressing and wound clean as directed. Instructions differ for stitches, grafts, flaps and wounds left to heal naturally.

You may be able to drive after local anaesthetic alone, but not if you received a sedative. Do not drive if the dressing, swelling or repair affects your vision or ability to control a vehicle. Arrange a ride when the facility recommends one.

Many people return to desk work within a few days. More time may be needed for physical work, a large repair, a graft, or surgery near the eye, hand or foot.

Risks and possible complications

Mohs surgery leaves a scar. Scars usually change and soften over time, but their final appearance can take months to become clear.

Other possible complications include:

Risk is affected by the wound's location and size, the type of repair, smoking, medicines and health conditions that affect healing.

- Bleeding or a collection of blood under the skin
- Infection
- Wound separation or delayed healing
- Loss of part or all of a graft or flap
- Temporary or lasting numbness, tingling or tenderness
- Injury to a nearby nerve, which may affect movement
- Changes in skin colour, texture or contour
- A reaction to local anaesthetic or dressings
- Cancer returning despite treatment

Results and follow up

The surgeon usually knows during the procedure when the examined margins are clear. If tissue is sent for additional specialised testing, those results may take several days.

Clear margins mean no cancer cells were seen at the edges of the tissue examined. This greatly reduces the chance that cancer remains at that site, but it cannot guarantee that the cancer will never return.

Routine follow-up may include a wound check, removal of non-dissolving stitches and later skin examinations. Your healthcare team will set the schedule based on the cancer type and your history.

Protecting your skin from ultraviolet light and checking it for new or changing spots can help identify future concerns early.

Alternatives

The realistic alternatives depend on the cancer's type, depth, risk level and location.

Standard surgical excision removes the cancer with a planned border of normal-looking skin. The specimen is sent to a laboratory, so margin results come later. It is quicker on the day but may remove more healthy tissue, and another operation may be needed if margins contain cancer.

Scraping and heat treatment , called curettage and electrodesiccation, may treat selected low-risk cancers. It is quick but does not provide the same complete margin assessment and may leave a noticeable scar.

Topical medicines can treat some superficial cancers. They avoid an operation but require treatment over time, often cause local inflammation and do not confirm clear deep margins.

Freezing or light-based treatment may be offered for selected superficial lesions. These approaches preserve tissue but provide less information about whether all cancer cells were removed.

Radiation therapy can treat some cancers when surgery is unsuitable or declined. It avoids surgical removal but requires multiple treatments in many cases, can cause long-term skin changes and makes future surgery more complicated.

Monitoring or symptom-focused care may be reasonable in selected people with serious health problems or limited treatment goals. The trade-off is that the cancer may continue to grow.

When to call your healthcare team

Contact your healthcare team promptly for increasing redness, warmth, swelling or pain; pus-like drainage; fever; wound edges opening; or a graft or flap becoming dark, pale or unusually cold.

Follow the facility's instructions for bleeding. Contact the team urgently if bleeding continues despite firm, uninterrupted pressure for the recommended time.

Seek emergency care for heavy bleeding that will not stop, fainting, severe trouble breathing, chest pain or signs of a serious allergic reaction such as swelling of the face or throat.

Questions about dressings, stitches, expected bruising or routine wound checks can usually wait for normal clinic hours unless symptoms are worsening.

Common questions

Will I be asleep?

Usually not. Local anaesthetic numbs the area while you remain awake. Sedation or general anaesthesia may be used for a separate complex reconstruction.

Can I drive home?

Possibly, if you received only local anaesthetic and the dressing does not affect vision or

movement. You must not drive after sedation. Follow the facility's transport instructions.

How painful is Mohs surgery?

The numbing injection can sting briefly. During surgery, you may feel pressure but should not feel sharp pain. Tenderness after the anaesthetic wears off is common and is often manageable with the recommended pain relief.

When will I know if all the cancer is gone?

The surgeon usually confirms clear examined margins before you leave. Additional pathology or specialised testing may take several days.

Why does it take several hours?

Most of the time is spent preparing and examining tissue. Each additional layer must be removed, processed and checked before the surgeon knows whether another stage is needed.

Will I have a scar?

Yes. Any surgery that cuts through the skin leaves a scar. Its size and shape depend on the final wound and repair. Scars generally become less noticeable as they mature.

Sources

- American College of Mohs Surgery. About Mohs Surgery
- American Academy of Dermatology. Mohs surgery: What to expect
- Mayo Clinic. Mohs surgery
- National Cancer Institute. Skin Cancer Treatment-Patient Version
- Connolly SM, Baker DR, Coldiron BM, et al. AAD/ACMS/ASDSA/ASMS 2012 appropriate use criteria for Mohs micrographic surgery. Journal of the American Academy of Dermatology . 2012;67(4):531-550. doi:10.1016/j.jaad.2012.06.009
- van Loo E, Mosterd K, Krekels GAM, et al. Surgical excision versus Mohs micrographic surgery for basal cell carcinoma of the face: a randomised clinical trial with 10-year follow-up. European Journal of Cancer . 2014;50(17):3011-3020. doi:10.1016/j.ejca.2014.08.018