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## **What is Mohs Micrographic Surgery?**

**Mohs micrographic surgery** is a specialized, highly effective technique for the removal of skin cancer. The procedure was developed in the 1930s by Dr. Frederic Mohs at the University of Wisconsin and is now practiced throughout the world. Mohs surgery differs from other skin cancer treatments in that it permits the immediate and complete microscopic examination of the removed cancerous tissue, so that all “roots” and extensions of the cancer can be eliminated. Due to the methodical manner in which tissue is removed and examined, Mohs surgery has been recognized as the skin cancer treatment with the highest reported cure rate. Some skin cancers can be deceptively large – far more extensive under the skin than they appear to be from the surface. These cancers may have “roots” in the skin, or along blood vessels, nerves, or cartilage. Skin cancers that have recurred following previous treatment may send out extensions deep under the scar tissue that has formed at the site. Mohs surgery is specifically designed to remove these cancers by tracking and removing these cancerous “roots”. For this reason, prior to Mohs surgery it is impossible to predict precisely how much skin will have to be removed. The final surgical defect could be only slightly larger than the initial skin cancer, but occasionally the removal of the deep “roots” of a skin cancer results in a sizeable defect. The patient should bear in mind however, that Mohs surgery removes only the cancerous tissue, while the normal tissue is spared.

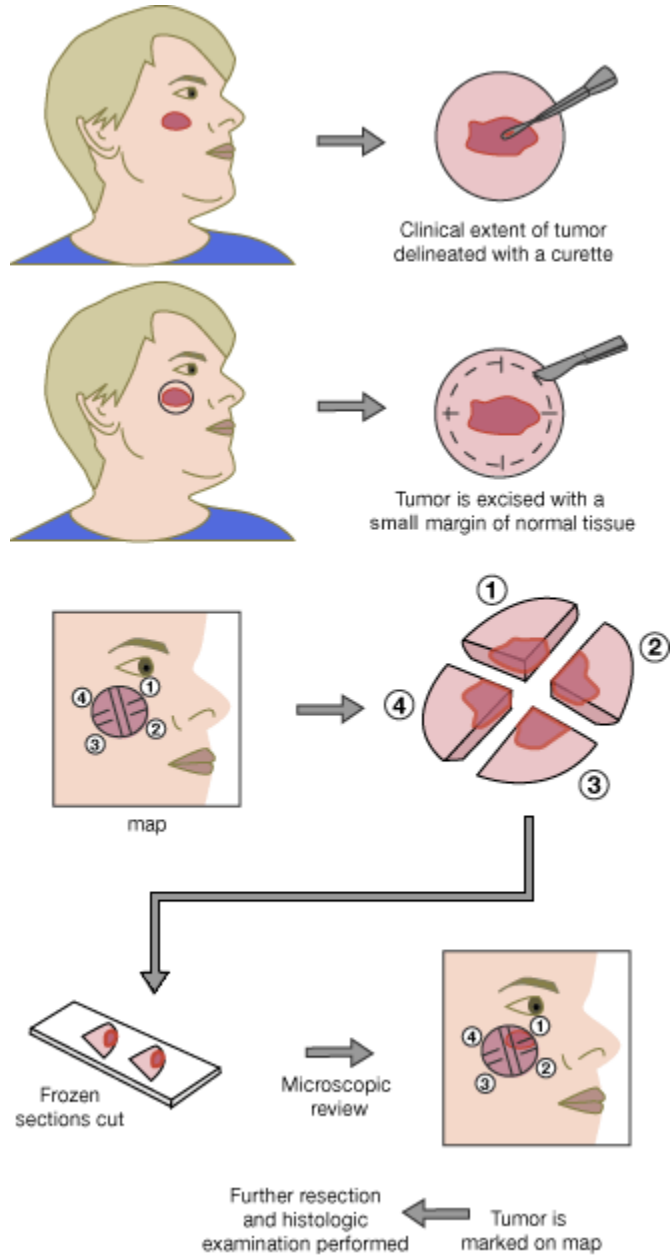
### **When is Mohs micrographic indicated?**

It is important to note that Mohs surgery is not appropriate for the treatment of all skin cancers. Mohs micrographic surgery typically is reserved for those skin cancers that have recurred following previous treatment or for cancers that are at high risk for recurrence. Mohs surgery also is indicated for cancers located in areas such as the nose, ears, eyelids, lips, hairline, hands, feet, and genitals, in which maximal preservation of healthy tissue is critical for cosmetic or functional purposes.

### **How is Mohs micrographic surgery performed?**

Mohs surgery is performed as an outpatient procedure in Dr. Niemeyer’s office. Although the patient is awake during the entire procedure, discomfort is usually minimal and no greater than it would be for more routine skin cancer surgeries. The area to be treated is cleansed, marked, and injected with a local Anesthetic. The Mohs surgeon removes the visible cancer, along with a thin layer of additional tissue. This procedure takes only a few minutes, and the patient waits while tissue is being processed and examined. The removed tissue specimen is cut into sections, stained, and marked on a detailed diagram (Mohs map). *Tissue cut in saucer shape.* Tissue is frozen on a cryostat, and technician removes very thin slices from the entire edge and undersurface. These slices are then placed on slides and stained for examination under the microscope. (This is the most time-consuming portion of the procedure often requiring one hour or more to complete.) The Mohs surgeon carefully examines the entire undersurface and complete edge of the specimen, and all microscopic “roots” of the cancer are precisely identified

and pinpointed on the Mohs map. Upon microscopic examination, if residual cancer is found, the Mohs surgeon utilizes the Mohs map to direct the removal of additional tissue (Stage II). Note that additional tissue is removed only where cancer is present. When microscopic examination reveals that there is no remaining tumor, the surgical defect is ready for repair. This process is repeated as many times as necessary to locate any remaining cancerous areas within the tissue specimen (Stage III, Stage IV, etc.)



## **Patient Preparation for Surgery**

You should provide your physician with a complete list of all medications (prescription, over-the-counter, vitamins and supplements). This is especially true regarding blood thinners, including aspirin, aspirin substitutes, herbal medicines and supplements. Your doctor may have other preoperative instructions. Pay special attention to these. Additionally, Mohs surgery on some areas may impair your ability to safely operate a motor vehicle. Discuss this with your doctor his before your surgery. It is a good idea to wear loose fitting clothing with buttons (avoid pullover clothing). Also, if the operative site is on the face, please do not wear make-up. We will obtain your written consent for the procedure, photographs will be taken, and your blood pressure and pulse will be recorded. If you have any questions, please feel free to ask them at any time.

## **Duration of Procedure**

Most Mohs cases can be completed in three or fewer stages, requiring less than four hours. However, it is not possible to predict how extensive a cancer will be, as the extent of a skin cancer's "roots" cannot be estimated in advance. Therefore, it is advisable to reserve the entire day for this surgical procedure, in case the removal of additional layers is required. *Waiting is inherent to the Mohs process, so the patient is encouraged to bring work, reading material, or other hobbies to pass time.*

## **Minor Post-Surgical Discomfort Expected**

Most patients do not complain of significant pain. If there is some discomfort, normally only Tylenol is required for relief. However, stronger pain medications are available and may be prescribed when needed. You may experience bruising, swelling and small amounts of bleeding around the wound. If any of these are severe, you should contact your surgeon.

## **What to expect after Mohs Surgery?**

Your surgical wound will likely require care during the weeks following surgery. Detailed written instructions will be provided. You should plan on wearing a bandage and avoiding strenuous physical activity for 1-2 weeks. Most of our patients report minimal post-operative pain which responds readily to medicines prescribed at the time of discharge. You may experience a sensation of tightness across the area of surgery.

Skin cancers frequently involve nerves and months may pass before your skin sensation returns to normal. In rare instances, the numbness may be permanent. You may also experience itching after your wound has healed. Complete healing of the surgical scar takes place over 12-18 months. Especially during the first few months, the site may feel thick, swollen, or lumpy, and there may be some redness. Gentle massage of the area (starting about 2 weeks after the surgery) will speed the healing process.

An indefinite follow-up period of observation is necessary after the wound has healed. You will be asked to return in six weeks following the procedure for reevaluation of the surgical site. Studies have shown that once you develop a skin cancer, there is a strong possibility of developing other skin cancers in the future. Should you notice any suspicious areas, please make an appointment for a complete evaluation. You will be reminded to return to your dermatologist on a frequent basis for continued surveillance of your skin.

## **Wound Healing, Scarring, and Scar Revision**

As with all forms of surgery, a scar will remain after the skin cancer is removed and the surgical area has completely healed. Mohs micrographic surgery, however, will leave one of the smallest possible surgical defects and resultant scars. Often, wounds allowed to heal on their own result in scars that are barely noticeable. Even following extensive surgery, results are frequently quite acceptable. In addition, scars do have the ability, through the body's own natural healing properties, to remodel and improve in appearance for a six to twelve month period. There are also many other techniques available to the patient for enhancement of the surgical area following skin cancer surgery. Depressed or indented scars may be elevated, using an implant such as Zyderm collagen. Likewise, a raised or roughened scar may be smoothed, using laser resurfacing or chemical peeling techniques. Skin flaps and grafts also may require a subsequent "touch up" procedure, to further improve their appearance.

### **Potential Complications Associated With Mohs Surgery**

Patients should understand that there is not an absolute guarantee that any given procedure will be totally free of complications or adverse reactions. Mohs surgery is no exception. During surgery, tiny nerve endings are cut, which may produce a temporary or permanent numbness in and around the surgical area. If a large tumor is removed or extensive surgery is required, occasionally a nerve to muscles may be cut, resulting in temporary or permanent weakness in a portion of the face. This is, however, an unusual complication. The surgical area may remain tender for several weeks or months after surgery, especially if large amounts of tissue were removed. Rarely, some patients experience intermittent itching or shooting pain in the surgical area. In addition, the skin grafts and flaps used to cover surgical areas may not fully survive, requiring additional repair.

### **Insurance Coverage for Mohs Surgery**

Most insurance policies cover the costs of Mohs surgery and the reconstruction of the resultant surgical defect. Please contact the billing department of your Mohs surgeon's office if you have questions about insurance coverage or to see if your insurer requires you to have a referral from your primary care physician. You may need to contact your insurance company directly about benefits or coverage.