

OHSU Department of Dermatology

# Mohs Surgery

Educational Information for Patients



## Department of Dermatology

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## Mission Statement

The Department of Dermatology's mission is to improve the health of the communities it serves by providing compassionate and dignified care to patients; comprehensive educational opportunities to develop exceptional health care providers; and supporting discoveries in basic, translational and clinical research.

*OHSU is an equal opportunity, affirmative action institution.*



Thank you for choosing the OHSU Department of Dermatology to provide for your dermatologic care. Since the 1920s, the Department of Dermatology has been educating doctors, researching skin diseases and providing world-class care to patients in Oregon and beyond. We thank you for trusting us with your care.

The surgeons and staff within the department welcome you. We have prepared this educational information to answer the most common questions presented to us by our patients. If you have additional questions after reading this material, please let us know.

Some of the questions addressed include:

- What is skin cancer?
- What is Mohs surgery?
- How do I prepare for Mohs surgery?
- What happens the day of surgery?
- What type of wound will I have and how will I care for that wound after surgery?
- What measures can I take to prevent future skin cancer?

## What is skin cancer?

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Cancer is the abnormal growth of cells at an uncontrolled and unpredictable rate. The cancer tissue usually grows at the expense of surrounding normal tissue. In the skin, the most common types of cancer are basal cell carcinoma and squamous cell carcinoma. The names reflect the cell within the skin from which the particular type of cancer originates. A less common type of skin cancer is malignant melanoma, which usually appears as a dark colored spot or bump on your skin and slowly enlarges. At OHSU Department of Dermatology, we treat basal cell carcinomas, squamous cell carcinomas, malignant melanoma and other unusual skin tumors.

## What are basal cell and squamous cell carcinomas?

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Both of these cancers behave and are treated similarly. The difference lies in the cell from which it originates within the skin. Often, this can only be distinguished by examining the skin under a microscope. Basal cell carcinoma is the most common cancer of any type, with over 1,000,000 new cases a year. Both basal and squamous cell carcinomas most commonly occur on the head and neck but can occur anywhere. The carcinoma often begins as a small bump that can look like a pimple, but will continue to enlarge, often bleeds and does not heal completely. It may be red, flesh-colored or darker than the surrounding skin. Basal cell carcinoma rarely spreads (metastasizes) to distant parts of the body. Instead, it grows larger and deeper, destroying nearby parts of the body in its path. Squamous cell carcinoma behaves locally like basal cell carcinoma. However, certain tumors can metastasize (spread elsewhere) from the skin. This will be discussed with you prior to surgery.



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The abnormal growth (cancer) originates in the uppermost layer of the skin. The cancer then grows downward, forming root and fingerlike projections under the surface of the skin. Unfortunately, at times these roots are so subtle they cannot be seen without the aid of a microscope. Therefore, what you see on your skin is sometimes only a small portion of the total tumor. There are several different types of basal and squamous cell carcinoma. It is important to distinguish these types prior to treatment, as different therapies may be required. For this reason a biopsy is usually performed prior to treatment.

The most common cause of skin cancer is long-term exposure to sunlight. This is why skin cancers develop most often on the face and arms (sun-exposed body parts). They occur more commonly in fair-skinned people than dark-skinned people and in the United States they are found more frequently in the southern (sun-belt) areas. Superficial x-rays, which were used many years ago for treatment of certain skin diseases, may result in skin cancer many years later. Trauma (scars), certain chemicals, and rare inherited diseases may also contribute to the development of skin cancer.

## What about melanoma?

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Melanoma is the deadliest skin cancer accounting for two-thirds of all deaths attributed to skin cancers. The standard treatment for melanoma is surgical removal of the melanoma and an area of normal appearing skin surrounding the melanoma. There are special cases, especially on the head and neck region, however, where Mohs micrographic surgery (or just 'Mohs surgery,' further explained later) is beneficial in the treatment of melanoma. Many of the melanomas in this region have poorly defined borders making standard excision difficult.

Mohs surgery in the treatment of melanoma is modified. The initial stages done by frozen sectioning is the same as for other skin cancers. At the conclusion of the standard Mohs surgery, however, an additional rim of tissue is removed for additional histological examination that can take a few days to process. This additional step allows for a more precise treatment of the melanoma. **Accordingly, the reconstruction will usually be delayed until this final rim of tissue is cancer free.**

## How successful is the treatment of skin cancer?

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Initial treatment of skin cancer has a greater than 90 percent success rate. Methods commonly used to treat skin cancer include excision (surgical removal and stitching), curettage and electrodesiccation (scraping and burning with an electric needle), cryosurgery (freezing) and radiation therapy ("deep x-ray"). There is also an advanced technique called Mohs surgery. Many skin cancers are easily and effectively treated by the other methods listed above and do not require Mohs surgery. The method chosen depends upon several factors, such as the microscopic type of the cancer, the location and size of the cancer and previous therapy used.



Mohs surgery is reserved for skin cancer that has come back after being treated by another method, or for skin cancer that is in an area where it is important to preserve healthy tissue for maximum functional and cosmetic result, such as eyelids, nose, ears, lips, fingers, toes and genitals.

If a skin cancer comes back after it has been treated by any method other than Mohs, retreating using one of the other methods has a success rate of less than 75 percent. However, the success rate for Mohs surgery, even in treating these recurrent cancers, is about 97-98 percent.

Since initial treatment options have high success rates, the use of Mohs surgery is intentionally reserved for recurrent skin cancer and skin cancer in the specific areas listed above. Mohs surgery is very time consuming and requires an extensive and skilled team of medical personnel, in addition to the Mohs surgeon. The vast majority of Mohs surgeons are dermatologists who have had subspecialty (fellowship) training after completing their dermatology residency (training). At OHSU, our Mohs surgeons are fellowship trained and members of the American College of Mohs Micrographic Surgery.

## What is Mohs surgery?

In the early 1940s, Dr. Frederick Mohs, a professor of surgery at the University of Wisconsin, developed a form of treatment of skin cancers he called chemosurgery. “Chemosurgery” is derived from the words “chemical” and “surgery.” The addition of “Mohs” honors the doctor who developed the technique. It is a highly specialized form of treatment for the total removal of skin cancers. It is performed by a team of medical personnel that includes physicians, nurses and technicians. The physician heading the team has subspecialty (fellowship) surgical training in the technique and is recognized by the American College of Mohs Micrographic Surgery. Other physicians on the team include fellows and





residents who assist while learning the technique. The nurse is an important part of the team who will help answer your questions, respond to your anxieties, assist in surgery, and instruct you in the dressing and wound care after the surgery is performed. A technician performs the important task of preparing the tissue slides, which are examined under a microscope by the physician.

The word “chemosurgery” when used today is really a misnomer. When Dr. Mohs initially introduced the procedure, he applied a chemical (zinc chloride) to the tumor and surrounding skin, which fixed the tissue prior to its removal. Since 1974, the procedure has been refined and improved upon so the vast majority of cases are done using fresh tissue (omitting the chemical paste).

Although the official name for the procedure is Mohs micrographic surgery, we prefer the shortened version of Mohs surgery. The surgery is performed as follows: The skin suspicious for cancer is injected with a local anesthetic so there is no feeling of pain in the area. To remove most of the visible skin cancer, the tumor is scraped using a sharp instrument called a curette. A disc-shaped piece of tissue is then removed with a scalpel around and underneath the scraped skin and carefully divided into pieces that will fit on a microscope slide. The edges are marked with colored

dyes; a careful map or diagram of the tissue removed is made; and the tissue is submitted for frozen section processing. Most bleeding is controlled using pressure and electrocautery, although occasionally a small blood vessel is encountered which must be tied using suture material. A pressure dressing is then applied and the patient is asked to wait while the slides are being processed. The surgeon will then examine the slides under the microscope and be able to tell if any tumor is still present. If cancer cells remain, they can be located by referring to the map. Another section of tissue is then removed and the procedure is repeated until the physician is satisfied that the entire base and sides of the wound have no cancer cells remaining. As well as ensuring total removal of the cancer, this process preserves as much normal, healthy tissue surrounding the skin as possible.

The removal and processing of each layer of tissue takes approximately one hour. Only 20 to 30 minutes of that is spent in the actual surgical procedure. The remaining time is required for slide preparation and interpretation. It usually takes two or three stages to



complete the surgery. Therefore, by beginning early in the morning, Mohs surgery is generally finished in one day. Sometimes, however, a tumor may be extensive enough to necessitate continuing surgery a second day.

At the end of Mohs surgery, you will be left with a wound. Several reconstruction options will be discussed with you in order to provide the best possible cosmetic result. The reconstruction is usually performed on the same day.

### **The possibilities include:**

- Healing by granulation involves letting the wound heal by itself. Experience has taught us that there are certain areas of the body where nature will heal a wound as nicely as any further surgical procedure. There are also times when a wound will be left to heal knowing that if the resultant scar is unacceptable, some form of reconstructive surgery can be performed at a later date.
- Closing the wound with stitches is often performed on small- to medium-size wounds. This involves some adjustment of the wound and sewing the skin edges together with a combination of deep and superficial sutures. This procedure speeds healing and can offer a good cosmetic result. For example, the scar can lie along a wrinkle line. However, the scar line may be longer than what you may have expected.
- Skin grafts involve covering a surgery site with skin from another area of the body. There are two types of skin grafts. The first is called full thickness graft. This graft requires a thicker layer of skin to achieve proper results. In this instance, skin is usually removed from around the area or distant site (the donor site) and stitched to cover the wound. The donor site then is sutured together to provide a good cosmetic result. The second graft type is the split-thickness graft. This is a thin shave of skin, usually taken from the thigh, which is used to cover a surgical wound. This can be either a permanent coverage or temporary coverage before another

cosmetic procedure is done at a later date.

- Skin flaps involve movement of adjacent, healthy tissue to cover a surgical site. Where practical, they are chosen because of the excellent cosmetic match of nearby skin.

In summary, by microscopically pinpointing affected areas and removing these tissues, the Mohs surgeon can successfully remove your skin cancer. Because normal tissue is preserved to the greatest extent possible, the Mohs surgeon is able to offer you the possibility of a good cosmetic result. Although an attempt will be made to minimize the scar, you will be left with a scar of some kind.

### **How do I prepare for the day of surgery?**

The best preparation for Mohs surgery is a good night's rest followed by breakfast. In most cases, the surgery will be completed on an outpatient basis. If you wish to have an anti-anxiety medication, it will be given to you before the surgery begins. Because you can expect to be here for most of the day, it is wise to





**We request that you stop taking any aspirin or ibuprofen compounds (like Anacin, Bufferin, Advil or Motrin) at least one week before your surgery.**

This is because it may interfere with the normal blood clotting mechanism, making you bleed more than normal during surgery. If your doctor recommends aspirin, please verify with your doctor before discontinuing aspirin. Alcohol, Vitamin E, Ginkgo biloba and garlic pills also increase your bleeding risk so please discontinue these at least one week prior to surgery.

Most insurance carriers cover the cost of Mohs surgery and reconstruction. OHSU bills are split into two parts: one for the place where you receive care and the other for the services provided by your surgeon. Please be prepared to give insurance information to our billing office and bring any forms that may need processing. We can counsel you concerning your insurance coverage at the time of surgery. If your insurance plan requires pre-approval or an HMO referral, please help us to make sure this is in place prior to your surgery.

bring along a book, magazine or laptop. We have a wireless network if you would like to connect to the Internet. Also, because the day may prove to be quite tiring, it is advisable to have someone accompany you the day of surgery to provide companionship and a ride home. If you are given an anti-anxiety medication, we require that someone else drive you home.

You may be asked to have a preoperative visit to discuss your surgery. At this visit, the technique will be discussed in detail, you will meet the team performing the surgery, a biopsy may be performed (if it has not already been done), and necessary paperwork will be finished (consents, insurance forms, etc.).

If you are coming from a great distance and/or are being referred by a physician familiar with the technique, you may be referred directly for Mohs surgery without a preoperative visit. If you are new to our clinic then a map and travel instructions are included with this booklet, in addition to a questionnaire concerning allergies, medications, and medical history. Please fill this out and bring it with you on the day of surgery.



AMBULATORY SURGICAL DEN...										
PATIENT NAME	SITE	DIAGNOSIS	I	II	III	IV	V	VI	VII	CLOSURE
TWICH	① FOREHEAD	SCC	3							2'
V PROBLEY	① NOSE	BCC	2	1	2					Wound
LARRY TIL	① NOSE	BCC	2							2'
MICHAEL	① CHEEK	SCC	2							2'
ROBERTSON	① EYE	BCC	2							
BRADLEY	① CHEEK	MIS	2							W/C
POY BUNHOSHI	① EYE	BCC	2							W/C
CHANEK	① LIP	BCC	2							
ERIC	① CHEEK	BCC	2							
CHRIS D	① CHEEK	SCC	2							

## What happens the day of surgery?

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Your appointment has purposefully been scheduled early in the day. Upon your arrival on the 5th floor of the Center for Health & Healing, you should proceed to the check-in desk under the teal disk (at the far end of the building). When the surgical suite becomes available, our medical staff will escort you to that area of clinic. If you have not had a consultation visit, we will go through the procedure with you, examine the questionnaire you have filled out and answer any questions you have. A surgeon will also be available to answer questions.

After preliminary preparation of the skin, you will be placed on the surgical table and the area around your skin cancer will be anesthetized (numbed) using a local anesthetic (a shot). This may be uncomfortable, but usually this is the only pain you will feel during the procedure. Once the area is numbed, a disc shaped piece of tissue will be removed and the bleeding controlled. The tissue will be carefully handled by the surgeon, diagrammed and sent to the technician to be processed into microscopic slides. A pressure dressing will be placed over your surgical wound and you will be free to wait in the waiting area. On average, it takes an hour for the slides to be prepared and studied. During this time you may rest, read, use the Internet (we have a wireless network), or take a walk around the building. There is a café and coffee bar located on the first floor.

Most Mohs surgery cases are completed in two or three stages. You will be re-anesthetized for each stage needed. Each stage involves the removal and microscopic evaluation of your skin for cancer. Therefore, the majority of cases are finished in one day. Once we are sure that we have totally removed your skin cancer, we will discuss our recommendations with you for dealing with your surgical wound. Often, the wound can be closed the same day.

## What can I expect after the surgery is complete?

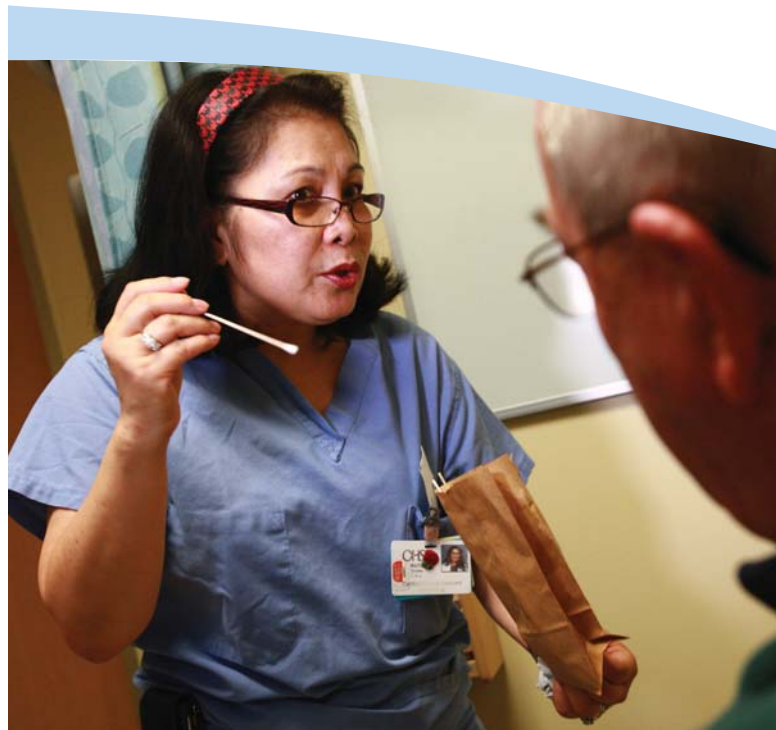
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### Pain

Most people are concerned about pain. The majority of people will experience remarkably little discomfort after surgery. Due to its potential to cause bleeding, we request that you do not take aspirin for pain, but use a Tylenol or a Tylenol-like painkiller. In some cases a stronger pain medicine will be prescribed. If pain persists or develops several days after surgery, you should notify our office.

### Bleeding

A small number of patients will experience some bleeding after surgery. It usually can be controlled by the use of pressure. You should take a gauze pad and apply constant pressure over the bleeding point for 20 minutes. Do not lift up or relieve the pressure at all during that period of time. If bleeding persists after continued pressure for 20 minutes, repeat the pressure for another 20 minutes. If this fails, a doctor can be reached 24 hours a day by calling 503 494-9000 and asking for the dermatologist on call. If necessary, visit





a local emergency room for assistance. Your wound care instructions will also list phone numbers, if you have questions.

### **Complications**

There are some minor complications that may occur after Mohs surgery. A small red area may develop around your wound. This is normal and does not necessarily indicate infection. However, if the redness does not subside in two days or the wound begins to drain pus, you should notify us immediately.

Itching and redness around the wound, especially in areas where adhesive tape has been applied, are not uncommon. If this occurs, ask your pharmacist for a non-allergic tape and let us know about this complication on your return visit.

Swelling and bruising are very common following Mohs surgery, particularly when performed around the eyes and mouth. This usually subsides within four to five days after surgery and may be decreased by the use of an ice pack in the first 24 hours.

### **Numbness**

At times, the area around your operative site will be numb to the touch. This area of numbness may persist for several months or longer. In some instances it may be permanent. If this occurs, please discuss it with your doctor at your follow-up visit.

Although every effort will be made to offer the best possible cosmetic result, you will be left with a scar. The scar can be minimized by the proper care of your wound. We will discuss wound care in detail with you and give you wound care information, which will clearly explain how to take care of whatever type of wound you have.

## **Will I develop more skin cancers?**

After having skin cancer, statistics show that you have a higher chance of developing another skin cancer. The damage your skin has already received from the sun cannot be reversed. However, there are precautions that can be taken to prevent further skin cancers. They involve good common sense. You should use a sunscreen; applying it at least 10 minutes before exposure to light. Higher SPF numbers are more protective. We recommend that you use a sunscreen that protects against both UVA and UVB with a SFP of 30 or higher. Regardless of manufacturers' claims, we recommend that you reapply sunscreen after swimming. A wide brimmed hat, long sleeved shirt, and other protective clothing are also appropriate. Avoiding excess sunshine is recommended.

You should have your skin checked very closely by a dermatologist at six-month intervals. Our policy is to follow the majority of our patients until the wound is healed. Once the wound is healed, patients can continue with their referring physician. If you have not yet established care with a dermatologist, your surgeon can give you a referral. We recommend six-month follow-up visits for two years, then yearly. Of course, any areas of your skin that change, fail to heal, or just concern you should be brought to the attention of your referring dermatologist immediately. He or she can adequately treat most small skin cancers when they are detected early.

## Your Mohs surgery providers

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Our surgeons are fellowship trained in Mohs reconstructive and cosmetic surgery and are members of the American College of Mohs Surgery.

### Neil A. Swanson, M.D.



Dr. Swanson is a professor of dermatology, otolaryngology and surgery and director of dermatologic, Mohs and laser surgery. He is also the former chairman of the Department of Dermatology. Dr. Swanson

received his dermatologic training at the University of Michigan and completed his surgical fellowship at the University of California, San Francisco in 1979. His clinical practice includes Mohs micrographic and reconstructive surgery, as well as laser surgery. Dr. Swanson is an international lecturer and author on the detection and treatment of skin cancer, as well as cosmetic surgery procedures, such as laser surgery, dermabrasion, chemical peels, fillers and Botox. He has authored more than a hundred journal articles, authored or edited five textbooks, and contributed chapters to numerous textbooks.

### Anna A. Bar, M.D.



Dr. Bar is an assistant professor of dermatology. Dr. Bar specializes in skin cancer surgery, including Mohs micrographic surgery and reconstruction, laser and cosmetic surgery, sclerotherapy, tumescent liposuction, fillers and local

anesthesia cosmetic rejuvenation. Dr. Bar received her medical degree from New York University medical school, followed by an internal medicine internship at New York's Lenox Hill Hospital. After completing dermatology training at OHSU, she pursued additional fellowship subspecialty training in Mohs surgery and cosmetic and laser surgery at the California Skin Institute. Dr. Bar has lectured and taught courses for physicians at the national meetings of the American Academy of Dermatology, the American Society of Dermatologic Surgery, and the American College of Mohs Micrographic Surgery. She regularly instructs residents and medical students in skin cancer surgery.