A Patient's Guide to

SKIN CANCER

and

MOHS'

MICROSCOPICALLY CONTROLLED SURGERY

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Dr. Thomas Rohrer is the director of Mohs Surgery at SkinCare Physicians of Chestnut Hill. Until January 2002, he served as the Chief of Dermatologic Surgery at Boston University Medical Center and the Boston Veterans Administration Hospital, and the Director of the Boston University Center for Cosmetic and Laser Surgery. Dr. Rohrer is a leader in all of the major national dermatologic surgery societies and associations and has served on the Board of Directors of the American College of Mohs Surgery, the Association of Academic Dermatologic Surgeons, the American Society for Dermatologic Surgery, and the American Society for Dermatologic Surgery Association.

Dr. Rohrer is a magna cum laude graduate of Georgetown University and the Georgetown University School of Medicine. He was the recipient of the Michael J. Caruso Award, given to the medical graduate who best exemplified humanitarian care to their patients. Dr. Rohrer completed his internship in internal medicine at Yale University Hospital and completed a residency in dermatology at the combined Boston University-Tufts University program. He completed a Mohs and Dermatologic Surgery fellowship at the University of Pennsylvania under the direction of Dr. Leonard Dzubow (the president of the American College of Mohs Surgery).

Dr. Rohrer has lectured nationally and internationally, instructing other dermatologists and plastic surgeons on various aspects of dermatologic and laser surgery. His textbook on facial reconstruction is the national best selling text on the subject. He has also published in numerous dermatologic and plastic surgery journals and been an editor for six other dermatologic surgery textbooks. Dr. Rohrer has appeared multiple times on NBC, ABC, CBS, FOX, and CNN news as an expert on lasers, skin cancer, and other related subjects. He has also been quoted in the New York Times, Boston Globe, Boston Herald, Boston Magazine, Redbook, Good Housekeeping, Allure, and Cosmopolitan. Dr. Rohrer was voted as one of the Best of Boston Doctors in 2007.

Dr. Rohrer is Board Certified by the American Board of Dermatology and is a member of the Association of Academic Dermatologic Surgeons, American Society for Dermatologic Surgery, American College of Mohs Surgery, and the American Society for Lasers in Medicine and Surgery.

This guide has been created by Dr. Rohrer
to answer the questions most patients have about skin cancer
and Mohs' surgery. Please read it carefully. This information only supplements Dr. Rohrer's consultation with you.
Please, do not hesitate ask any questions you may have about your skin cancer or the surgery; our phone numbers are listed in the back of this guide.

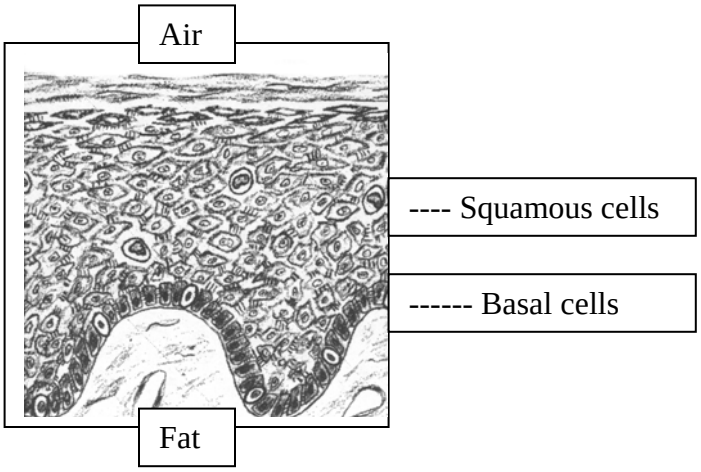
A Patients Guide to Skin Cancer and ***Mohs' Microscopically Controlled Surgery***

Skin Cancers:

Skin cancer is the most common form of all cancers. Almost two million new cases of skin cancer will be diagnosed in the United States this year alone. The three most common types of skin cancer are **1) basal cell carcinoma** (the most common and least dangerous), **2) squamous cell carcinoma**, and **3) melanoma** (the least common but most dangerous type). These names come from the name of the type of cell that becomes cancerous, a basal cell, squamous cell, or a melanocyte.

Cancer is a very frightening word used to describe many very different diseases with many very different prognoses. A cancer simply means that a cell is replicating faster than it normally should. Most cells that make up the body divide and reproduce in an orderly manner at a set slow pace. This allows the body to grow, replace worn-out tissue, and repair injuries. If one of these cells is injured in some way (for example, by the sun in skin cancers) and becomes cancerous, it begins to replicate and divide much more quickly. With the cell dividing more rapidly, the body is unable to process all of the new cells and a mass or ball of these cells is formed. This mass of new cells is called a tumor.

In some tumors, the cells may break away from the mass, travel in the blood or lymphatic stream and set up in another part of the body and continue growing and invading the tissue. This process is called metastasizing, and is associated with the more dangerous forms of cancer. This almost never occurs in basal cell carcinomas and is rare in squamous cell carcinomas that are smaller than two centimeters in width. Although not common with the majority of melanomas discovered today, Melanoma is more likely to metastasize and spread to other parts of the body such as the lungs, liver, and bones than other forms of skin cancer.



Basal Cell Carcinoma:

Basal cell carcinoma is the most common form of all cancers in this country. It accounts for approximately 75% of all skin cancers and of the three skin cancers listed above, has the best prognosis. Although they are typically seen in the sun-exposed areas of fair-skinned middle to older aged adults, basal cell carcinomas are being seen more and more frequently in the younger population. The name is derived from the type of cell in the skin that has become cancerous - the basal cell. Basal cells line the base, or bottom, of the uppermost layer of skin, the epidermis. When one of these cells is damaged (by exposure to the sun or other forms of radiation) and begins to grow and replicate much more rapidly than it normally does, it is called a basal cell carcinoma.

Basal cell carcinomas generally start at one particular spot and grow, very slowly, out and downward in the skin. The true size and extent of skin cancers cannot be fully appreciated by simply looking at the surface of the skin. In fact, the skin cancer has usually been growing for several months to years beneath the skin before it surfaces and can be seen by the naked eye. Only under microscopic examination is it possible to determine the extent of the tumor. Often times, if the tumor is very small, the biopsy may remove most of the skin cancer and the skin may appear very normal on the surface. Unfortunately, there are usually tumor cells beneath this normal appearing skin that are continuing to replicate and grow. On the other hand, some basal cell carcinomas may be quite large. Although it is extremely unusual for a basal cell carcinoma to metastasize, if left untreated, these tumors will continue to grow to very large sizes and may invade bone and other tissues beneath the skin.

Squamous Cell Carcinoma:

Squamous cell carcinomas, especially when they are larger than 2 cm in width, can be a more serious disease than basal cell carcinomas. The normal squamous cells are located in the upper and middle part of the most superficial layer of skin, the epidermis, and tend to be more aggressive when they become cancerous. These skin cancers usually grow more quickly, are more likely to invade structures beneath the skin, and may metastasize to other parts of the body. Still, only approximately 5% of squamous cell carcinomas actually do metastasize, most often to local lymph nodes. Clinically, squamous cell carcinomas usually appear as rough scaly red spots on the skin. Unfortunately, as with basal cell carcinomas, it is very difficult to judge the size and extent of the skin cancer by simply looking at the skin surface. Skin cancers often grow under what appears to be normal skin to the eye.

Malignant Melanoma:

This is potentially the most serious form of skin cancer. Malignant melanoma generally appears as a brown or black spot, with shades of red or purple in it. They may arise on their own or develop in a pre-existing mole. Since melanoma is not often treated with the microscopically controlled or Mohs surgery, it will not be discussed further in this text. All information in this brochure refers to basal and squamous cell carcinomas.

Why people get skin cancers:

Although we do not know all of the factors that cause skin cancer, excessive exposure to sunlight is the single most important factor in the formation of skin cancer. Other forms of radiation, such as ultraviolet light therapy or X-ray therapy, may also contribute to the formation of skin cancers. Over time (many years), a normal basal or squamous cell may be transformed into a cancerous cell. As a cancerous cell, it will begin to divide much more rapidly than the body is accustomed to, and a collection of that type of cell will form. This collection of cells is known as a tumor.

Skin cancers occur more frequently in people with fair complexions (blonde hair, blue eyes), individuals of Celtic decent, and those exposed to a more than average amount of sun. Darker skinned individuals, who have more pigment to shield their skin from the harmful rays of the sun, rarely form skin cancers. Although the effects of the sun's rays are cumulative, there is usually many years separating the significant exposure to the sun and the formation of the skin cancer. The majority of sun exposure generally occurs during the teenage and early twenties years, while most skin cancers do not begin to occur until the forties. The skin never forgets any of the sun it has received.

The best way to protect yourself from future skin cancers is to make a serious attempt at reducing the amount of sunlight you are exposed to. One of the single best ways to fight the sun is to put on a daily moisturizer with an SPF of at least 15 in it. Even if you are not planning on being outside very long, every little bit counts and adds up. If you know you will be out in sun, apply a sun screen with a **S**un **P**rotection **F**actor (SPF) of 30 or greater with good UVA protection (there is presently no numbering scale for this protection). In addition, wear a broad rimmed hat, and limit your exposure to the sun during the mid-day (10 AM to 3 PM), when the rays are most intense. You don't have to change your entire lifestyle, just alter it intelligently and take the proper precautions. Although skin cancers treated with Mohs surgery are extremely unlikely to recur, an unfortunate statistic is that 50% of people, who develop a basal cell carcinoma, will develop another one within 5 years. That is why it is important to have your skin examined by your primary dermatologist on a regular basis.

Treatment of skin cancers:

Skin cancers may be effectively treated by several different methods. The most common ways include electrodesiccation and curettage (scraping and burning), cryotherapy (freezing), radiation therapy (X-rays), various topical agents, photodynamic therapy, traditional excisional surgery, and Mohs' microscopically controlled surgery. The treatment of each skin cancer must be individualized, taking into account the type, size, and location of the cancer, the patient's age, and whether or not the cancer has been treated before. Of all forms of treatment for skin cancers, Mohs microscopically controlled surgery has the highest cure rate.

Mohs or Microscopically Controlled Surgery:

Microscopically controlled surgery was developed by Dr. Frederick Mohs in the 1940s as a more precise way to remove skin cancers. Originally, chemicals were applied to the skin and the entire surgical procedure could take several days. The technique has been refined over the years to the point where the skin cancer is now removed and examined under the microscope for any remaining tumor almost immediately. The basic principle behind the Mohs' technique, is to remove the entire skin cancer without taking any more normal skin than is absolutely necessary.

Often times what can be seen on the skin surface only represents a part of the actual skin cancer, "the tip of the iceberg" so to speak. We cannot see the "roots" of the skin cancer

that are under the skin surface. Instead of guessing approximately how far these "roots" extend under and around the skin cancer, the microscope is used to trace out and map the exact extent of the tumor. The surgeon may then remove only the cancerous tissue. This prevents either removing too little, and leaving tumor behind to come back or recur (usually larger) in the future, or from removing too much, and creating a larger than necessary wound. In essence, the best of both worlds is achieved with this technique. The entire skin cancer is removed and as much as possible of the normal skin is preserved. The Mohs' microscopically controlled technique offers a cure rate of 98 - 99%, the highest of any technique available.

Since Mohs' surgery requires highly trained personnel, and can be time consuming, it is reserved only for certain cases. The four most common indications for using the Mohs' technique are 1) when the tumor is located on a structure that is so important that one wishes to remove only the diseased tissue and preserve as much of the normal skin as possible (face, hand, etc…) 2) when the cancer has been previously treated and has come back (recurred), 3) when the margin or extent of the tumor cannot be discerned, and 4) when the tumor occurs in an area of the body where it is not effectively curable with other methods.

Preparing for your surgery date:

There is usually no special preparation required before the Mohs' surgery. We recommend being well rested and having a good breakfast on the morning of surgery. If your surgery is scheduled in the afternoon you can have lunch. Continue to take all of your prescribed medicines. We do not recommend coming off prescribed anticoagulants such as warfarin (Coumadin), Heparin, Plavix, and Trental. Unless it is medically necessary, we ask that you **do not take aspirin or aspirin containing products, such as Anacin and Bufferin, for ten days prior to surgery unless a physician has prescribed them for you.**. Ibuprofen containing products, such as Motrin and Advil, should also be avoided prior to surgery. You may take Celebrex or acetaminophen products, such as Tylenol. We also ask that you do not take natural products that are known to increase bleeding such as Vitamin E, Ginko bilba, ginseng, and garlic to name a few. Take all of your other usual medications unless directed otherwise. We also require that you **do not drink any alcohol for four days prior to surgery**, since this also thins the blood (dilates the blood vessel) and may cause more bleeding.

We recommend washing your hair the night before or the morning of surgery, as your wound and initial dressing must remain dry for the first 24 hours. We also suggest you wear loose fitting, comfortable clothing.

The length of the surgery varies greatly depending on the size and location of the skin cancer. Although the average length is approximately 1 ½ - 2 ½ hours, you should plan on spending significantly longer with us. You should also arrange to have someone drive you home after surgery.

What to expect on the day of surgery:

Again, eat a good breakfast and if your appointment is in the afternoon please feel free to eat a nice lunch, take your normal medications unless directed otherwise, wear comfortable clothing, and be prepared to spend the day. Mohs' surgery is a minor surgical procedure, performed on an outpatient basis in an ambulatory surgery or office setting. You should arrive for your appointment a few minutes early in order to complete any registration and check in requirements. A medical assistant or nurse will escort you to a changing room, ask you a few more questions, take your blood pressure, ask if you have any questions, and attain your consent for the surgery. The biopsied site will be identified by you and Dr. Rohrer (or one of his assistants) and marked out. You will then be escorted back into the procedure room.

The area around the skin cancer will be cleaned, and the skin cancer will be marked again with a sterile marking pen. A local anesthetic (lidocaine) will then be injected to the area. This is generally the only part of the surgery that causes any discomfort, and it is usually no worse than what was experienced with the biopsy. In fact, we add a special medicine that helps decrease pain with injection. Once the area is numb, a small layer of tissue will be removed and a map of it will be made. The small amount of bleeding that may occur is stopped with an electric cautery unit and a dressing is placed on the wound. This part of the procedure typically takes 10 to 20 minutes.

At this point, the removed tissue is frozen, cut for microscopic slides, put through a series of stains that highlight the skin cancer cells, and cover slipped. Dr. Rohrer will then review these slides under the microscope and create a map of any remaining tumor. In this manner, the exact location of any residual tumor may be determined and then removed, without having to remove any of the skin that appeared normal under the microscope. This process takes about 40 minutes.

Although the area should still be numb from the first stage, a little more anesthetic agent is added (usually painlessly) to keep the area numb for further stages and the reconstruction. Using the microscopic "map" of the skin cancer, only the area or areas seen as cancerous are then removed. The process is repeated until the entire skin cancer is removed. It is this process of systematically searching out and removing all of the "roots" of the skin cancer that gives Mohs' surgery its cure rate of 98-99%.

Although some skin cancers are removed in one stage, the average tumor requires two or three stages for removal, and some require several more. The total time of your visit will depend on how many stages or times this process must be repeated. If your skin cancer should require more than one stage, try not to get discouraged. The intent is to remove the entire skin cancer, and to preserve any uninvolved normal skin. To achieve these goals, the tissue must be removed in very small, conservative layers.

When the tumor has been completely removed, a decision will be made as to the best method to repair the wound where the skin cancer had been. Depending on the size and location of the wound or defect, it may be allowed to heal by itself, closed side to side with sutures, or closed using a local skin flap or graft. If the skin is closed side to side, the circular shape that was created with the removal of the tumor must first be converted to an elliptical shape to close in a flat line. The ellipse must be three times as long as it is wide. This is why the suture line and eventual scar is three times as long as the skin cancer was wide. This is also why conserving tissue by using the Mohs technique is so important. Every millimeter of tissue we can spare translates into 3 millimeters less in scar length. In addition, the sutured line is intentionally elevated to take the pressure of the healing wound edges. Although this may seem unsightly at first, when the wound heals it is generally such a thin line that it is not perceived by others.

Almost all wounds are repaired on the day of surgery, however, it is occasionally necessary to utilize the unique skills of other surgical specialists. In these cases, the reconstruction will be arranged to occur later that same day or on a subsequent day shortly thereafter.

What to expect after surgery:

Detailed written instructions on wound care will be given to you and reviewed upon completion of the surgery. Essentially, you will leave the original bandage on for the first 24 hours, and then you will clean the wound twice a day with mild soap and water, place an ointment (Aquaphor Healing Ointment) on the wound, and then cover it with a small dressing. This will be continued until the sutures are removed. Sutures are generally left in the face for 7 days and other areas of the body for 14 days. It is very important to keep the wound moist with antibiotic ointment, and not to let it dry out. When a wound dries and a scab forms, it takes longer to heal and forms a more noticeable scar. Contrary to the old belief; scabs are not good. Do your best to prevent scab formation. If a scab does form, gently remove it with diluted hydrogen peroxide. Only use diluted hydrogen peroxide on a scab and not as part of your daily wound care. Hydrogen peroxide has been shown to slow wound healing.

Most patients do not report more than a minimal amount of discomfort the first day or two following surgery. This discomfort usually responds readily to Tylenol in its usual dosage. We do not want you to take any aspirin or ibuprofen containing products for three days following surgery. There may also be a normal sensation of itching or tightness that is experienced in the immediate post-operative period and some shooting sensations that can continue periodically for a year or so.

Often times patients will have "black and blue" marks and swelling around the site of surgery. This reaction is particularly frequent and exuberant around the eyes. Most of this is your body's reaction to being wounded. Cells from other areas come to the wound to help repair it. In doing so, they create swelling. This usually gets worse for the first three or four days after surgery, and then slowly begins to improve.

The wound must heal in the least stressful environment possible for optimal results. Therefore, we ask that you refrain from exercise for a week or two after surgery.

You may also experience some numbness around the area that was operated on. There are many small nerves that carry sensation to the skin. Some of these may be cut during surgery, and it may take 6 - 12 months before full sensation returns. Sometimes the skin cancer involves larger nerves. When these are cut, the loss of sensation or muscle weakness may be permanent.

Remember, every surgical procedure produces some form of a scar. Although every attempt will be made to minimize and hide the scar, the extent of the scarring depends on the size and depth of the skin cancer, and the healing properties of the individual. The scar will continue to improve for 8-16 months. After the first month, the area can be gently massaged if it feels thick or lumpy.

You will be seen for suture removal seven to fourteen days after surgery, and again four months after surgery to make sure everything is healing according to schedule. After the four-month visit, you should be monitored every six months to a year for new skin cancers. Although the chance of having the skin cancer recur after Mohs' surgery is only 1-2%, it does happen, and the area should be monitored. Even more importantly, there is a good possibility that a new skin cancer may develop in other areas in the future. Remember that 50% of patients will have a second skin cancer within five years of their first. This is why it is very important to protect yourself from the sun's rays, and to have a dermatologist follow your skin closely. If you should notice any new lesions and suspect they might be skin cancers, you should schedule an appointment promptly and not wait the six or twelve months before the next scheduled visit.

If you have any questions before, during, or after your surgery, please do not hesitate to ask them. There are no bad questions. Dr. Rohrer may be reached by calling:

Main Number: **(617) 731-1600**
Scheduling Office: **(617) 848-1620**
On call Beeper: **(617) 777-0716**

Dr. Rohrer may also be reached on beeper by dialing (617) 540-4158 followed by your telephone number after the beep. Dr. Rohrer will return your call as soon as possible.

Reminders

- ✓ Continue taking all of your prescribed medications as you normally would on the day of surgery.
- ✓ Refrain from taking aspirin, vitamin E, or ibuprofen products for ten days prior to surgery, provided you have not been placed on it for medical purposes. If a doctor has placed you on aspirin therapy, please continue to take it.
- ✓ Refrain from alcohol and natural supplements for four days prior to surgery.
- ✓ Be well rested and eat a good breakfast on the morning of surgery.
- ✓ Plan on spending a long time with us for your surgery.
- ✓ Have someone available to drive you home after the surgery.
- ✓ Refrain from exercise for a week or two after surgery
- ✓ Ask any questions you may have.