

A Patient's Guide to

SKIN CANCER AND MOHS MICROSCOPICALLY CONTROLLED SURGERY

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Skin Cancers:

Skin cancer is the most common form of all cancers. Over one 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 (becoming more common) and 3) melanoma (the least common but the most dangerous type). These names come from the name of the type of cell that becomes cancerous, a basal cell, a squamous cell or a melanocyte.

Cancer is a very frightening word that is used to describe many different diseases with many different prognoses. A cancer simply means that a cell is replicating faster than it normally should. Most cells that make up 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 more quickly. With the cell dividing more rapidly, the body is unable to process all of the new cells and a mass or a 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. Melanoma is more likely to metastasize and spread to other parts of the body such as the lungs, liver and bones.

Basal Cell Carcinomas:

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 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 the skin, the epidermis. When one of these cells is damaged (by exposure to the sun or other form of radiation) and begins to grow and replicate more rapidly than it normally does, it is called a basal cell carcinoma.

Basal cell carcinomas generally start at one particular spot and very slowly grow 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, skin cancer has usually been growing for several months beneath the skin before it surfaces and can be seen by the naked eye. Only under microscopic examinations is it possible to determine the extent of the tumor. Oftentimes, 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 basal cell carcinoma to metastasize, if left untreated these tumors will continue to grow to very large sizes and may invade bone and other tissue beneath the skin.

Squamous Cell Carcinomas:

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 the skin, the epidermis, and tend to be more aggressive when they become cancerous. These skin cancers usually grow more quickly and 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 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 naked eye.

Malignant Melanoma:

This is potentially the most serious form of skin cancer. Malignant melanoma generally appears as a brown or black patch; with shades and hues of red, brown, purple or other colors in it. They may arise on their own or develop in a pre-existing mole. There are over 100,000 new cases every year in the US. There are almost 10,000 Americans who die from melanoma every year. If the tumor is limited to the top layer of the skin (known as the epidermis) the cancer is called Malignant Melanoma in Situ or MMIS for short. MMiS has an excellent prognosis with near 100% survival. Since invasive 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, and malignant melanoma in situ.

Treatment of Skin Cancers:

Skin cancer may be effectively treated by several methods. The most common ways include electrodesiccation and curettage (scraping and burning), cryotherapy (freezing), radiation therapy (X-rays), traditional excisional surgery and Mohs or 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 treatments 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 1940's 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.

Oftentimes 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 can not see the "roots" of the skin cancer that are 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, leaving tumors 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. 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 higher trained personnel, and can be time consuming, it is reserved only for certain cases. The three most common indications for using Mohs' technique are 1) when the tumor is located on the structure that is so important that one wishes to remove only the diseased tissue and preserve as much of the normal skin as possible, 2) when the cancer has been previously treated and has come back (recurrence) and 3) in an area of the body where it is not effectively curable with other methods.

Preparing for your Mohs Surgery:

We recommend being well rested and having a good breakfast on the morning of the surgery. We recommend washing your hair the night before or the morning of the 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 3 to 4 hours, you should plan on spending most of the day with us. And since a great deal of the day is spent in the waiting room waiting for the tissue to be examined under the microscope, we recommend you bring a good book to read. You should also arrange to have someone drive you home after the surgery.

We also recommend starting Arnica, especially Arnica Forte, one to two days before your procedure and continuing it for several days afterward as directed on the package. Arnica Forte contains Arnica montana, which has traditionally been used to reduce bruising and minor discomfort, and Bromelain, an enzyme found in pineapples that supports healthy tissue recovery. Beginning Arnica Forte shortly before surgery may lessen bruising and swelling and help the area return to a normal appearance more quickly. If you have medical conditions or take prescription medications, please check with your primary care provider before starting any new supplement.

What to expect on the day of the surgery:

Again, eat a good breakfast, take your normal medication unless directed otherwise (please refer to the last page), wear comfortable clothing, and be prepared to spend the day. Mohs' surgery is a minor surgical procedure, performed as an outpatient procedure 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 advance practice provider will escort you to a procedure room, ask if you have any questions, and attain your consent for the surgery.

The area around the skin cancer will be cleaned, and the skin cancer will be marked with a sterile marking pen. A local anesthetic (lidocaine) will then be injected to the area. Generally, this is the only part of the surgery that causes any discomfort, and it is usually no worse, and oftentimes less painful than that of the biopsy done previously. We will wait approximately 10 minutes for the anesthetic agent to become fully effective. 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 will be stopped with a cautery unit and a dressing will be placed on your wound. At this point, you will be escorted back to the waiting room for approximately 45 minutes required to process the tissue.

During this time, the tissue will be frozen, stained, and cut for microscope slides. Your doctor will then review these slides under the microscope and create a microscopic map of any tumor remaining. 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 requires approximately 45 minutes to complete.

You will then be escorted back into the procedure room for the second stage of the procedure. 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. 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 flap or graft. Although most wounds are repaired here on the day of the surgery, it is occasionally necessary to utilize the unique skills of other surgical specialists. In these cases, the reconstruction may be arranged to occur later that same day or on a subsequent day shortly thereafter. In certain cases, allowing surgical defects to heal over time before reconstruction can lead to improved outcomes. This approach is referred to as "delayed reconstruction" and is usually done prior to placement of certain full thickness skin grafts.

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 one to two times a day with 3% hydrogen peroxide, place an ointment such as Aquaphor and Mupirocin (often cocktailed together) on the wound, and then cover it with a dressing. This will be continued until the sutures are removed (usually 7 to 14 days after the surgery depending on the surgical site and other factors). It is very important to keep the wound moist with ointment and not to let it dry out. When a wound dries and a scab forms, it will take longer to heal and form a more noticeable scar.

Most patients do not report more than a minimal amount of discomfort for 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 postoperative period. Oftentimes patients will have "black and blue" marks and swelling around the site of surgery. This reaction is particularly frequent and exuberant around the eyes. 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 days after surgery, and then slowly begins to improve.

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 to 12 months before a full sensation returns. Sometimes 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 12 and in some cases up to 18 months. After the first month, the area should be gently massaged if it feels thick, raised, or lumpy.

You will be seen for suture removal seven to fourteen days after surgery, and again three months after surgery to make sure everything is healing according to schedule. After the three month visit, you should be monitored every six months to a year for new skin cancers. Although the chance of having 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 for at least five years. 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.

Reminders:

You may eat and drink your regular breakfast the morning of the surgery and you may also bring snacks and drinks with you. In terms of medications, please review the list provided below for medications to avoid before/after your surgery. All other medications may be taken regularly. Please remember to bring any medications you will need to take during the day with you. Please leave valuable items at home as we cannot assume responsibility for them. Wear little or no makeup. Please wear comfortable or loose fitting clothing.

Please remember:

This is a surgery appointment and not an office visit. You should plan to be in our office for several hours. You will be awake for your surgery and you will be able to go home the same day. We prefer you have someone accompany you to your appointment although this is not mandatory. For those who need a sedative such as Valium, Ativan or similar anxiolytic medications then it is mandatory to have someone drive you home. The waiting area is limited in the number of persons it can accommodate. Please limit the number of relatives that come with you to the office. If you come to your appointment by yourself, please have someone available for us to call in case you need assistance to travel home after your surgery.

Preparing for Mohs Surgery:

Medications and Supplements to Stop 1 Week Prior to Surgery

Aspirin or Blood-Thinning Products:

ASA/"Baby" Aspirin Advil Alka-Seltzer Aleve Anacin Anaprox Asaphen Ascripin Aspirin Bayer Aspirin BC Powder BC Tablets Bufferin Celebrex	Darvon Compound-65 Doan's Pills Ecotrin Empirin Excedrin Feldene Fiorinal Ibuprofen Indocin Midol Motrin Naproxen	Norgesic Nuprin Pepto-Bismol Percodan Persantine Robaxisal St. Joseph Aspirin Soma Compound Synalgos DC Talwin Ticlid Vioxx Zorprin
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For the following medications please **consult with your cardiologist, Primary Care Provider (PCP), or the prescribing physician** to determine the appropriate protocol for discontinuation prior to surgery.

- Xarelto
- Eliquis
- Plavix
- Warfarin
- Pradaxa
- Lovenox
- Aspirin (Including "baby" Aspirin 81 mg)

Vitamins and Supplements:

Multivitamins Vitamin E Fish Oil	Feverfew Turmeric Dong Quai	<u>G Supplements:</u> ● Garlic (in large amounts) ● Ginkgo Biloba ● Ginger (in large amounts) ● Ginseng
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Resumption of Medications:

Blood thinners and the other medications listed above may be resumed 2-3 days after the procedure unless your Primary Care Provider (PCP) or cardiologist/prescribing physician advises otherwise.

Reminders:

You may take Tylenol (also known as Acetaminophen), Datril, Darvocet or Darvon, or Percocet if needed for pain relief. If you have any questions regarding whether or not medications you are taking are blood thinners or not, please call our office at (703)-492-4140 (Woodbridge) or (703)-893-1114 (McLean). Review list of Aspirin and other blood-thinning products and medications and if possible, avoid for one week prior to surgery, provided your medical doctor has given approval for discontinuing these medications. Additionally, refrain from consuming alcohol or alcohol-containing products 3-4 days prior to surgery. Furthermore, we also strongly recommend starting Arnica Forte 1-2 days before your surgery to help reduce bruising and swelling. This supplement is available for purchase in our office and through our online store at shop.bderm.com. Lastly, be well-rested and eat a good breakfast on the morning of surgery!

About Our Mohs Surgeon

Dr. Amir A. Bajoghli is a board-certified and fellowship-trained dermatologist and Mohs surgeon. A Northern Virginia native, Dr. Bajoghli earned his undergraduate degree from the College of William and Mary and his medical degree from the Medical College of Virginia. He completed his postgraduate medical education and training in Boston, Massachusetts, where he served on the faculty, teaching medical students and dermatology residents from Harvard University, Boston University, and Tufts University. He is board certified in Micrographic (Mohs) Dermatologic Surgery and Dermatology and board eligible in Internal Medicine.

Dr. Bajoghli later returned to Northern Virginia, where he became the Director of Mohs Micrographic and Dermatologic Surgery at George Washington University School of Medicine and served as the Course Director for the core curriculum in dermatologic surgery. He held the position of Chief of the Dermatology Section at Inova Fairfax Hospital for nine years. In addition he has served on the Board of Directors for 10 years and as the President of the Medical Society of Northern Virginia.

Currently, Dr. Bajoghli is an Adjunct Assistant Professor in the Department of Dermatology at Georgetown University School of Medicine, where he lectures dermatology residents and mentors medical students, particularly those interested in medical publications. He has published many articles in prestigious medical journals. He is also a mentor for the University of Virginia School of Medicine where medical students rotate at Skin & Laser Dermatology.

Dr. Bajoghli is an accomplished athlete, having completed over 40 triathlons, including IronMan Maryland in 2019. You might spot him training on local running and biking trails or in swimming pools. He also enjoys photography and spending time with his wife, Hasti, an architect, and their three boys.

Fun fact: Dr. Bajoghli dreams of competing on Jeopardy! one day. Feel free to share your favorite trivia questions with him during your visit!