

Your Guide to Skin Cancer

And

**MICROSCOPICALLY CONTROLLED
(MOHS) SURGERY**



at DUKE UNIVERSITY MEDICAL CENTER

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INTRODUCTION

The Department of Dermatology at Duke University is recognized nationally for the research and treatment of complex skin disorders, including skin cancer. Duke's dermatology department has maintained its lead as a pioneer of new therapies for skin disease.

The Dermatologic/Mohs Surgery Service is a leader in the Southeast for the treatment of skin cancer through the use of microscopically controlled (Mohs) surgery. The Mohs technique combines surgery with meticulous microscopic examination of the removed tissue to treat skin tumors most accurately. With the most advanced equipment to perform the surgery and the expertise of its physician staff, Duke's Dermatologic/Mohs Surgery Service is on the forefront of patient care.

This guide is intended to answer the questions most frequently asked by skin cancer patients preparing for microscopically controlled (Mohs) surgery for the removal of skin tumors. This information supplements, but does not replace, the consultation between you and your physician. Any concerns should be fully aired and discussed prior to the date of your surgery.

REMEMBER – There is no such thing as an unimportant or silly question.

“WHAT IS SKIN CANCER?”

Skin Cancer is not one problem but a collection of separate diseases. There are three common forms of skin cancer:

- 1. Basal Cell Carcinoma**
- 2. Squamous Cell Carcinoma**
- 3. Malignant Melanoma**

Basal Cell Carcinoma is not only the most common form of skin cancer, but it is also the most frequently occurring of all human cancers. The name is derived from the skin cell that is growing in an uncontrolled fashion – the basal cell. This is the cell type located at the base or bottom of the upper skin layer – the epidermis. Although the basal cell carcinoma can extensively damage the skin and underlying tissues where it appears, this cancer very rarely spreads to other, more distant parts of the body unless its size becomes enormous. It does not spread through the bloodstream and almost never involves the lymph nodes (glands). If a basal cell carcinoma is left untreated, however, it can destroy any tissue or structure in its path of growth. This is of particular concern when the basal cell carcinoma is located near the eye, ear, or nose. One cannot predict how quickly basal cell carcinomas will grow. Although they are usually slow-growing tumors, basal cell carcinomas can also grow rapidly and invade deeply. Basal cell carcinomas initially may have the appearance of a small pimple, a non-healing or bleeding sore, a shiny bump, a cyst, or a larger, deeper growth. Discomfort and itching can

occur, but these symptoms are uncommon. Unfortunately, any symptoms are not reliable indicators of whether or not any lesion is a skin cancer. The diagnosis of a basal cell carcinoma must be confirmed with a biopsy (a surgically removed skin sample that is sent to a pathology laboratory for microscopic examination).

Squamous Cell Carcinoma can be a more serious skin cancer than basal cell carcinoma. The squamous cells are located above the basal cell layer in the epidermis, the outer layer of skin. Although squamous cell carcinoma can also cause extensive tissue destruction, this tumor may also spread to the nearby glands or lymph nodes. Uncommonly, the cancer can also travel through the bloodstream to distant areas of the body. When treated early and appropriately, squamous cell carcinoma is typically curable before it reaches the point where it can become a threat to a patient's health. Squamous cell carcinoma usually appears as a rough, scaly area of skin or a larger growth/bump.

Malignant Melanoma, which often looks like a brown or black patch or an unusual mole, is potentially one of the most serious forms of skin cancer because melanoma has a higher likelihood of spreading inside the body (metastasizing). Microscopically controlled (Mohs) surgery has emerged as a potential form of treatment for invasive melanoma, particularly when the cancer is located on critical areas of the face. Please discuss any questions concerning the treatment of malignant melanoma with your Mohs surgeon.

Other, less common skin cancers (such as dermatofibrosarcoma protuberans, merkel cell carcinoma, atypical fibroxanthoma, sebaceous carcinoma, etc.) can also be particularly well suited for treatment using the Mohs surgical technique, and your physician can certainly provide additional information regarding the surgical management of these unusual tumors.

“WHY DID I GET SKIN CANCER?”

Unfortunately, we do not know many of the factors that cause skin cancer; however, skin cancer does occur more frequently in people with fair complexions (blonde hair, blue eyes), in individuals of Celtic descent, and in those who have received extensive exposures to the sun. Accumulated exposure to the damaging ultra-violet radiation of the sun over many years may change normal cells of the skin into cancer cells. This is why areas of the body exposed constantly to the sun (the face, hands) tend to be more prone to skin cancer than sun-protected areas. Nonetheless, sun exposure is not the entire answer to the origin of skin cancer. Dark-skinned individuals who hide from the sun can also occasionally develop skin cancer. Other factors such as genetic predispositions and exposures to environmental agents may also play significant roles.

“HOW CAN I PROTECT MYSELF FROM DEVELOPING FUTURE SKIN CANCERS?”

The only factor that you can control is your continuing exposure to the sun. Proper use of sunscreen with a **Sun Protection Factor (SPF)** of 15 or greater is the most important preventive measure. Sun protective clothing, hats, and sunglasses can also provide appropriate blocking of damaging rays from the sun. You do not have to change your lifestyle dramatically – only use caution and sun protection. You should also plan to commit to regular follow-up examinations of

your skin by your dermatologist so that sun-damaged skin can be closely examined in order to detect early signs of future skin cancers.

“HOW IS SKIN CANCER TREATED?”

Skin cancer can be treated effectively by a variety of methods, including traditional surgery, plastic surgery, desiccation and curettage (scraping and burning), freezing (cryosurgery), radiation therapy (X-ray treatments), and Mohs (microscopically controlled) surgery. The treatment of each skin cancer must be individualized, taking into consideration such factors as the patient’s age, location of the cancer, type of cancer, and whether or not the cancer has been previously treated. In some instances, more than one type of skin cancer therapy may be appropriate for you. Your physician will discuss treatment alternatives with you at the time of your consultation.

“WHAT IS MICROSCOPICALLY CONTROLLED (MOHS) SURGERY, AND WHY HAS MY PHYSICIAN CHOSEN THIS FORM OF TREATMENT?”

Microscopically controlled surgery was developed by Dr. F. Mohs in the 1940s as a precise method of treating certain cancers. The technique has been extensively refined in subsequent years, and its popularity has increased dramatically during the last decade. The Mohs technique combines surgical removal of the skin cancer with immediate microscopic examination of the removed tissue in order to identify any residual cancerous tissue.

There are several situations in which Mohs surgery is appropriate:

1. When the tumor occurs in an area of the body (e.g., the nose, ear, scalp, hand, or genitalia) where it is not effectively curable by other treatment methods.
2. When the tumor is located on a structure that is so important that one wishes to remove only the diseased tissue and spare as much of the normal skin as possible (e.g., the nose, the eyelid, the ear).
3. When the cancer has been previously treated and has come back.
4. When the margin or extent of the tumor cannot easily be defined by visual inspection.

“MOHS SURGERY NOT ONLY HAS A HIGHER CURE RATE THAN ANY OTHER TREATMENT METHOD, BUT IT ALSO CREATES THE SMALLEST POSSIBLE SURGICAL WOUND, PERMITTING THE BEST FINAL COSMETIC RESULT.”

Unlike other methods of treatment, Mohs surgery does not rely on surface inspection to judge the extent of the skin cancer. What one sees on the surface may only be “the tip of the iceberg.” If the tumor is not well defined, if it blends into the normal skin, or if it is mixed with scar tissue from a previous operation, a surgeon using conventional treatment techniques might either remove too little tissue and leave tumor behind, causing tumor recurrence, or over-compensate and remove too much tissue, producing unacceptable scarring. Mohs surgery, using microscopic control, allows the surgeon to trace out the extent of the tumor and remove **only** diseased tissue.

“WHAT DOES MOHS SURGERY INVOLVE?”

Mohs surgery is typically a relatively minor surgical procedure performed on an outpatient basis in the office. **Be prepared to spend the entire day in the office**, although 3-5 hours is the average time required. Eat a full breakfast and bring some reading material. It is also important to bring a friend or family member along. Although you will be physically able to drive yourself home, you may be tired and have some swelling. The surgery is performed in steps or stages. Each stage involves about 5 minutes of surgery to remove the cancerous tissue, at which point we will microscopically examine the tissue to determine if any skin cancer remains. The number of steps or stages required depends upon the size and depth of the cancer.

The actual procedure is as follows:

1. A local anesthetic will be injected into the area of surgery. This is the only part of the surgery that will cause any discomfort – the sensation of stinging or burning. The pain is typically quite mild, temporary, and very easily tolerated.
2. Once the cancer and the surrounding areas are numb, a smaller layer of tissue will be removed with a scalpel. Unless the cancer is quite small, more surgery than a single, initial layer is often required.

Remember, it is always better to initially remove too little tissue and perform a second stage than to remove more normal tissue than necessary.

3. The small amount of predictable bleeding will be stopped with a machine that coagulates the blood vessels, a sterile dressing will be applied, and you will return to the waiting room.
4. The tissue will be brought to the laboratory, where it is processed. Microscopic slides are prepared by a technologist and examined by your physician to determine if the cancer is persistent.
5. If the microscopic examination of the surgical specimen by your physician reveals remaining tumor, a precise, three-dimensional map is produced, indicating the exact location of the remaining cancer.
6. If additional cancer is discovered on the examination of your initial surgical specimen, you are then brought back to the operating suite, and additional anesthetic is injected to reinforce the first injection. In most cases, the initial anesthetic has not entirely worn off, and you will feel little or no discomfort.
7. The second stage now involves the removal of another layer of tissue – but only where the map indicates residual cancer. The healthy tissue is left alone; only the diseased tissue is excised.
8. This tissue is brought to the laboratory and the process is repeated until all evident cancer is removed.

The average tumor requires two to three stages for removal. Do not be discouraged if your cancer is not removed in one step. We are tracing the extent of the tumor very carefully and trying hard not to remove any uninvolved, normal tissue. This process must be done in small layers.

“WHAT HAPPENS AFTER SURGERY?”

When the surgery is complete, there will be a defect or open wound in the area that the skin cancer occupied. This wound may be smaller or larger than you had anticipated. There are then three alternatives:

1. The wound can be allowed to heal by itself. The time of healing depends on the size of the defect. In some areas of the body, wounds allowed to heal by themselves produce very acceptable cosmetic results.
2. In most areas of the face, the wound is often closed with sutures to avoid distortion or unacceptable scarring of the skin. Occasionally, a small graft of skin from an inconspicuous site or a transfer of excess skin from a location near the wound (a flap) is required to produce the most medically and cosmetically appropriate healing. These procedures can typically produce excellent cosmetic results.
3. If the wound is very extensive, you may be required to obtain consultation with other physicians in order to ensure the most appropriate reconstruction of your wound. Our office will arrange these consultations in the very unlikely event that they are necessary.

“HOW DO I CARE FOR MY WOUND AFTER SURGERY?”

Regardless of whether or not your wound is sutured, you will need the following items to clean your wound.

1. Q-tips
2. 3% Hydrogen Peroxide and/or saline solution
3. Antibiotic ointment (Polysporin or Bacitracin)
4. Telfa gauze or other non-adhesive surgical dressing
5. Paper tape (e.g., Micropore)

Please follow these steps when you clean the surgical area:

1. Clean the wound thoroughly but gently with a cotton applicator (Q-tip) dipped in Hydrogen Peroxide or saline solution as directed.
2. Use a second, clean Q-tip to dry the area.
3. Use a third Q-tip to apply antibiotic ointment to the wound.
4. Cover with Telfa (“No-Stick”) gauze cut to the size of the wound. Secure with non-allergic Micropore paper tape.

“WILL THERE BE ANY AFTER EFFECTS OF MY SURGERY?”

Discomfort, if it should occur with this procedure, is usually very mild and can be managed with ordinary Tylenol. A prescription pain medication is also frequently provided to make certain that you are comfortable in the initial hours following your surgery. Do not take aspirin or aspirin-containing products (Excedrin, Anacin, etc.) for post-operative pain relief, as they can promote bleeding.

Other problems that are infrequent include black and blue marks and swelling. These problems can particularly occur around the eyes, and they may last up to two to three weeks. Rarely, if the skin cancer involves nerves of the skin, surgical removal can lead to numbness or muscle weakness in the area. This usually resolves within 8 to 12 months, but the numbness may occasionally be permanent.

Remember, **every** surgical procedure produces scarring of some type. Although every attempt will be made to minimize and hide the scar, the extent of scarring depends on the size and depth of the cancer.

The main goal of Mohs surgery is to remove your skin cancer as completely as possible and to prevent cancer recurrence. Although the cure rate is not 100%, Mohs surgery offers the highest cure rate of any procedure available in the treatment of skin cancer. The overwhelming majority of patients never require further treatment.

Please remember: this information provides a general guide to skin cancer and Mohs surgery. Please consult your physician if any questions arise.

PRE-SURGICAL CHECK LIST

1. Eat a normal meal prior to surgery.
2. Bring along some reading material.
3. Have a friend or relative accompany you or at least drive you home.
4. Avoid alcohol for several days before and several days after surgery, as alcohol can cause excessive bleeding.
5. Consult your physician to try to eliminate any medications that could promote bleeding for a similar period (e.g., Motrin and other aspirin-like medications, Coumadin, heparin). If you are taking any medications that “thin the blood,” you will need to discuss this with a nurse PRIOR to your appointment.
6. Purchase the following:
 - Q-tips
 - 3% Hydrogen Peroxide and/or saline solution
 - Antibiotic ointment (Polysporin or Bacitracin)
 - Telfa gauze
 - Paper tape (e.g., Micropore)

FOR MORE INFORMATION

For more information about Mohs surgery or to make an appointment, please call the Duke University Dermatologic Surgery Unit at 919-419-4945 or toll free at 877-515-2203.

Jonathan L. Cook, M.D. is the Director of Dermatologic Surgery at Duke University where he is a Professor of Dermatology and an Assistant Professor of Surgery. Dr. Cook is a native of Southwest Virginia/Northeast Tennessee. He completed his undergraduate education at the College of Charleston (valedictorian), and he received his medical degree from the Medical University of South Carolina (valedictorian). Following medical school, Dr. Cook completed an internship at the Harvard Medical School (New England Deaconess Hospital) and a residency in dermatology at Emory University. He pursued his fellowship training in Mohs and dermatologic surgery at the University of Pennsylvania, the oldest dermatology department in the United States and a center internationally known for excellence in the surgical management of skin cancer. Following this fellowship, Dr. Cook became an Assistant Professor of Dermatology at the University of Pennsylvania, where he was also chief of the department's satellite practice program. Dr. Cook has been at Duke University Medical Center since 1999, where he has been frequently named as one of the "Best Doctors in North Carolina," "America's Top Doctors," "Best Doctors in America," and "America's Top Doctors for Cancer." Dr. Cook is board certified.

SERVICES

- Mohs micrographic surgery for primary and recurrent skin cancer
- Surgical excision of benign and malignant skin lesions
- Management and surgical excision of melanoma
- Cryotherapy for benign and malignant skin lesions.
- Surgical treatment of nail disorders
- Chemical peels for photoaged and photodamaged skin

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