TEXAS SURGICAL DERMATOLOGY PA
Experience, Excellence, Commitment

Your Treatment Options for Skin Cancer

Author: Tri H Nguyen MD, FAAD, FACMS, FACPh

For smaller, superficial, less aggressive skin cancers

Options in this category include:

- ❑ Topical therapy
- ❑ Photodynamic therapy (PDT)
- ❑ Electrodessication and curettage (EDC)
- ❑ Cryotherapy
- ❑ Injection therapy

These therapies have in common the following:

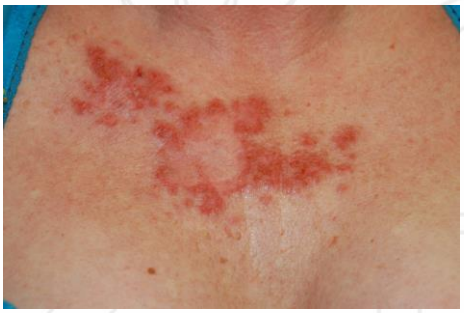
1. A biopsy and pathology reading are helpful in determining which therapy is recommended.
2. Appropriate for shallower, less aggressive skin cancers.
3. Destruction of skin cancer tissue (either physical and or chemical) and surrounding skin.
4. Outpatient nature. Local anesthesia may or may not be used.
5. Creation of wounds that require time to heal.
6. There is no tissue sent for pathology examination.

Topical therapy

If your skin cancer is confined to only the top layers of the skin (determined by a biopsy), then topical therapy may be appropriate. These superficial cancers include some squamous cell cancers in-situ (squamous cell cancer in-situ is also known as Bowens disease) and superficial basal cell cancers. In-situ means a lesion is confined to the epidermis, the top layer of skin. Imiquimod (IMQ) and or 5-fluorouracil (5FU) are two such topical creams for skin cancers.

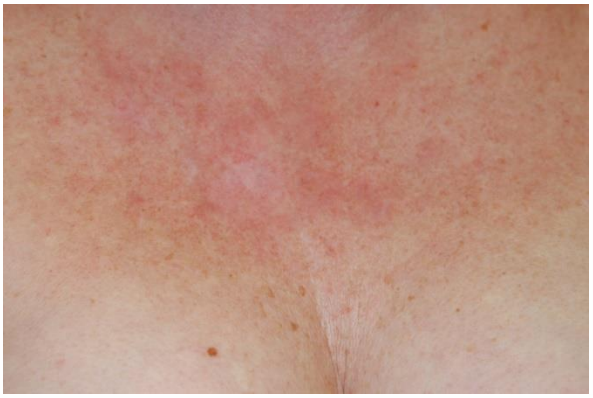
How it works:

IMQ works by stimulating your body's own immune system to destroy cancerous cells (topical *immunotherapy*). 5FU works as a topical *chemotherapy*, preventing rapidly dividing cells from growing. Both creams cause significant redness and inflammation and need to be used for many weeks to be effective. Occasionally, these creams may be recommended in addition to surgery for maximal success.



Skin reaction during topical therapy for superficial skin cancer. Note the selective response as only skin cancer and precancerous cells are reacting.

Benefits (Topical Therapy-continued):
The advantage of topical treatment is the relative lack of scarring. Treated skin is less sun-damaged in appearance and nearby precancers are also treated as well. Topical therapy is not appropriate for more aggressive skin cancers.



Disadvantages:
Your skin may look red, raw, and inflamed for the duration of treatment. This may prevent you from appearing in public or attending important events. If you do not follow the wound care prescribed, then your skin may develop itching, burning, infections, and pain. This treatment is usually avoided in the hot summer months because of potential discomfort (heat and humidity) and light/sun sensitivity.

Photodynamic therapy (PDT)

How it works:
PDT applies a chemical (photosensitizer: photo (light) sensitizer) that sensitizes your skin to light. Cancerous skin treated with this photosensitizer is then exposed to various light sources, which causes a destructive reaction similar to a bad sunburn. Your skin remains light-sensitive for 24-48 hours and healing occurs over the next several days to a week. Several sessions of PDT may be needed to treat the skin cancer.

Benefits:
Similar to topical therapy

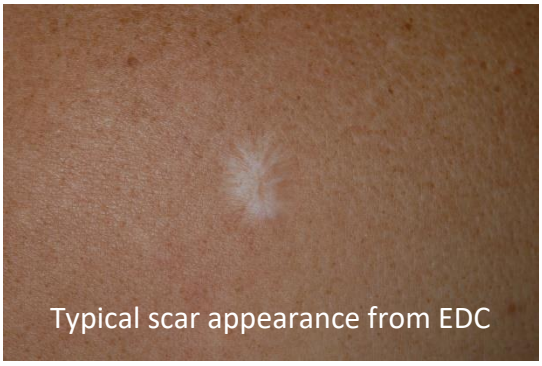
Disadvantages:
Your skin is extremely light sensitive and vigorous sun avoidance is essential to prevent a blistering burn. The treatment can also be painful and pain medications may be needed. Multiple visits may be needed. Otherwise, the disadvantages of PDT are similar to topical therapy.

TEXAS SURGICAL DERMATOLOGY PA
Experience, Excellence, Commitment

Electrodessication and Curettage (EDC)

How it works:

Otherwise known as "scraping and burning", EDC uses a scraping instrument (curette) and electric currents (electrodessication) to destroy and burn your skin cancer under local anesthesia. The cancer lesion and a rim of surrounding skin (safety margin) are treated. Several passes are performed. This results in a shallow wound that heals by itself after several weeks.



Typical scar appearance from EDC

Benefits:

EDC is a relatively quick (10-20 minutes) outpatient procedure that is effective for small and superficial skin cancers (determined by a biopsy). The curette allows a physician to "feel" the extent of skin cancer involvement, as skin cancer tissue may be relatively friable and easily scraped compared to normal skin. It is convenient for both the physician and the patient. Since there are no stitches, there is less activity restriction than with other surgeries.

Disadvantages:

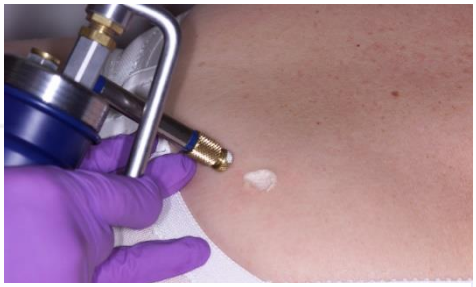
More than most techniques for skin cancer, the effectiveness of EDC greatly depends on the physician's experience. A wound from EDC may take many weeks to heal depending on the wound's size, depth, and location. During that time, the patient needs to perform wound care. The scar that results from EDC is often white in color, shiny, and occasionally thick to touch, which may or may not be a problem depending on location and personal preferences.

Cryotherapy

Cryotherapy uses liquid nitrogen (nitrogen gas that has been cooled to become a liquid) to freeze and destroy skin lesions (benign growths, actinic keratosis (precancers), and skin cancers).

How it works:

With or without local anesthesia, the skin cancer and a rim of surrounding skin (safety margin) are sprayed with liquid nitrogen to freeze the tissue. If sprayed long enough, the freeze will not only involve the top skin layer but also the tissue underneath. The tissue is then allowed to thaw and additional freeze-thaw passes may be repeated. Cryotherapy is typically performed harder and longer for skin cancers than it is for other lesions. The freezing, plus the body's immune response to the injury results in a blistered wound that then takes several weeks to heal.



Early basal cell cancer being destroyed with liquid nitrogen.

Benefits:

Cryotherapy may be performed effectively for more invasive skin cancers in patients who cannot undergo surgery. The equipment needs are minimal and it is a quick and convenient procedure.

Experience the Excellence in Dermatology

P: 832-663-6566 F: 832-663-6550

www.tsderm.com

21009 Kuykendahl Rd, Suite A. Spring, Texas. 77379

Disadvantages (Cryotherapy):

The effectiveness of cryotherapy is highly operator dependent and there are many technical variables, such as; 1) type of device used for freezing, 2) intensity of freezing (time to freeze and duration of freeze, and 3) number of freeze-thaw cycles. Cryotherapy can potentially penetrate deeper tissues. As a result, if freezing occurs over thin skin, over joints, or in hair bearing areas, then deep wounds, nerve injury, and hair loss may occur respectively. Cryotherapy leaves porcelain white scars because the freezing also destroys melanocytes (pigment producing cells in the skin). Otherwise, the disadvantages of cryotherapy are similar to EDC.

Injection therapy

A number of medications may be injected into the skin to treat skin cancers. The most commonly used is Interferon (IFN). Multiple injection visits are usually required.

How it works:

Interferon works by stimulating your body's immune response to destroy skin cancer tissue. The destruction is relatively specific and healthy tissue is usually spared (minimal collateral damage). The tumor progressively shrinks. Redness, inflammation, and flu-like symptoms may occur as part of the immune system response. A series of IFN injections requires 3 visits per week for 3 weeks (9 injections total). Several series at several months apart may be needed for maximum success (depending on the size of your skin cancer).

Benefits:

Interferon injections are usually well tolerated and usually not painful. Injection therapy is helpful for patients who cannot undergo surgery, or in cases in which surgery would likely leave an unacceptable scar. Usually, there is minimal scarring after injection therapy (especially IFN). The treated skin, however, may be lighter in color than the surrounding skin. For properly selected tumors, the cure rate may be exceptional. Injection therapy may be used as a complement to surgery. Prior to surgery, several series of injections may be performed to shrink the tumor as much as possible. Surgery may then follow to remove a skin cancer that is now much smaller than before.

Disadvantages:

The number of visits required is inconvenient for many patients. The medicines are expensive and not always covered by insurance. The flu-like symptoms may be troublesome but only rarely are they debilitating.

TEXAS SURGICAL DERMATOLOGY PA

Experience, Excellence, Commitment

For larger, deeper, more aggressive skin cancers

These therapies are typically more involved (i.e. more expertise, more visits, more recovery, more cost, more tissue changes, etc) and penetrate deeper into the skin (more invasive). Such options include:

- ❑ Wide local excision (WLE)
- ❑ WLE with intraoperative frozen sections (WLE with IOFS)
- ❑ Mohs micrographic surgery (MMS)
- ❑ Radiation therapy (RT)

These therapies have in common the following:

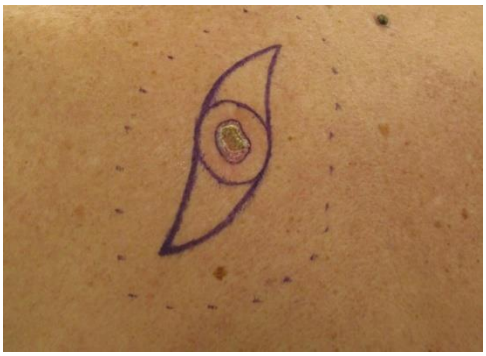
1. A biopsy and pathology reading are helpful in determining which therapy is recommended.
2. With the exception of radiation therapy, the treatments in this category involve the surgical removal of skin cancer tissue with a safety margin of surrounding skin.
3. In general, deeper wounds result from surgical therapy than for non-surgical options. These wounds may or may not require reconstructive surgery (repair of wound with stitches and other techniques) for optimal healing. The repair of these wounds may require some activity restrictions and follow-up.
4. With the exception of radiation therapy, various methods are used to examine the borders of the tissue removed (margin control) for tumor clearance. Not all methods of margin control are equally effective.
5. Either local anesthesia or general anesthesia may be needed depending on the surgery recommended. Radiation therapy does not require anesthesia.

TEXAS SURGICAL DERMATOLOGY PA
Experience, Excellence, Commitment

Wide local excision (WLE)

How it works:

Your skin cancer is surgically removed with a safety margin, either under local or general anesthesia. The more aggressive the skin cancer, the larger the safety margin is taken to increase your chances of complete cancer removal. After cancer removal, your surgeon may stitch or suture the wound closed and wait for the pathology results (sometimes a wound is allowed to remain open). The tissue is sent to a lab and examined by a pathologist. Usually, the results are not known until several days later. If there is still cancer remaining (positive margin), then the wound may need to be opened and additional surgery is performed until the margins are clear of cancer. For the additional surgery, your doctor may either recommend the same technique (WLE) or an alternative method (Mohs micrographic surgery or WLE with IOFS).



Football shaped design includes skin cancer (in center circle) and safety margin (outer circle). Dotted lines outline the extent of local anesthesia needed.

Benefits:

WLE is one of the most common methods of skin cancer removal. It may remove deeper tissue (skin, fat), which may be indicated for more aggressive skin cancers. Usually, muscle is not removed unless needed. WLE yields tissue for pathology examination (margin control) and allows further study of the skin cancer if needed. The tissue is processed as paraffin sections, which are considered the "gold standard" in that the best tissue quality and details may be seen. The wound is usually stitched (reconstructed) and there is faster healing. Cosmetic appearance of a repaired wound may be very good.

Disadvantages:

The safety margin that needed for skin cancer removal depends on many factors (location, skin cancer type, aggressiveness, etc). If the pathology results reveal residual skin cancer (occurs in less than 10% of cases), then the patient may need additional surgery that adds to the recovery and cost. Rarely, the margin may be negative (clear of cancer) but the cancer may still recur (come back). This occurs because the pathology evaluation samples only a small portion of the removed skin. For most skin cancers, this limited sampling is not an issue. For more aggressive skin cancers, however, roots of skin cancer may be missed and the skin cancer then recurs. Recurrent skin cancers are usually more difficult to treat.

If there was stitching, then these stitches may need to be removed and there are usually activity restrictions during the short-term. Operated skin is never as strong as normal skin and it requires many months for complete healing (six months to a year may be needed for final outcome, but patients are functional long before that). Complications of any surgery may include but are not limited to- infection, bleeding, nerve damage, loss of function, and suboptimal scarring. If there was general anesthesia for the WLE, then there is additional recovery, cost, and risks involved. Most patients who undergo general anesthesia, however, do well.

TEXAS SURGICAL DERMATOLOGY PA
Experience, Excellence, Commitment

Wide Local Excision with Intraoperative Frozen Sections

How it works:

Under sedation or general anesthesia, the surgeon removes cancer tissue with variable safety margins (similar to WLE). Unlike WLE, however, the pathology evaluation occurs during the surgery (Intraoperative frozen sections (IOFS)) by a pathologist. Results are known quickly with frozen sections (tissue that is rapidly frozen and processed). The surgeon removes additional tissue based on the frozen section readings of the pathologist. After the frozen sections are all negative (clear of cancer), then either the cancer surgeon or another physician (reconstructive surgeon) repairs the wound. For additional confirmation, part of the tissue that was examined as frozen sections are sometimes processed as paraffin sections and re-evaluated.

Benefits:

The frozen sections performed during the surgery yields quick results. Additional tissue may be removed without the need for separate visits. This gives your physician the ability to repair the wound with relative confidence that the margins are negative. Other benefits are similar to WLE.

Disadvantages:

Because of the rapid processing, frozen sections with WLE do not have the same quality and detail as paraffin sections ("gold standard"). As a result, some tumors may not be seen well. Rarely, the tissue that is sent for final confirmation after frozen sections show cancer that was missed. Additional surgery is then required. The tissue sampling in WLE with IOFS is also limited and not all of the margins are looked at. WLE with IOFS is typically much more expensive than with WLE alone. There are multiple factors that must be coordinated (the cancer surgeon, the operating room, the anesthesiologist, the pathologist, and the reconstructive surgeon if applicable).

Mohs Micrographic Surgery (MMS)

How it works:

Under local anesthesia, the Mohs surgeon removes the cancer tissue and processes it as modified frozen sections. These modified frozen sections are unique in that 1) the tissue quality and detail are excellent, closely resembling paraffin sections and 2) virtually 100% of the margins are examined, thereby reducing the chance for missing skin cancer roots. Modified Mohs frozen sections are processed within the Mohs unit and results are generally available within 20-60 minutes. The Mohs surgeon examines the frozen sections and more tissue is removed only where needed. When all margins are clear, then the wound is repaired (usually in the same day). Rarely, the wound cannot be reconstructed immediately and the patient is referred to another specialist for repair. The Mohs surgeon serves many roles. He/she is the cancer surgeon, the pathologist, and the reconstructive surgeon-all in one.

On the surface, MMS appears to resemble WLE with IOFS. The two techniques, however, are very different as seen in the table below.

TEXAS SURGICAL DERMATOLOGY PA
Experience, Excellence, Commitment

Table 1: Comparison between Wide Local Excision and Mohs Surgery

	Wide local excision with Intraoperative Frozen Sections (WLE with IOFS)	Mohs Micrographic Surgery (MMS)
Tissue removed	Safety margins are removed deep and wide to ensure cancer is completely removed.	Tumor tissue is removed with a minimum of surrounding tissue. Traditional safety margins are not used in Mohs surgery. In general, MMS removes at least 100-200% less tissue than WLE.
Tissue processing	Frozen sections	Modified frozen sections that closely resemble paraffin sections in quality and detail.
Margin evaluation	Multiple samplings of the tissue margins.	Virtually 100% or nearly all of the tissue borders are examined for tumor
Physician examining the pathology	A surgeon removes the cancer tissue and a pathologist examines that tissue under the microscope.	The Mohs surgeon is both the cancer surgeon and also the pathologist who examines the tissue. This permits excellent correlation between what is seen on the skin and what is seen under the microscope.

Benefits (Mohs Surgery):

MMS is considered an excellent option for many skin cancers (but not all) because of its maximal cure rate, sparing of healthy tissue, and safety. The Mohs procedure occurs under local anesthesia, which is generally the safest for most patients. Because of the completeness of tissue examination and correlation, MMS has the best chance of detecting skin cancer roots compared to WLE and WLE with IOFS. The defect from MMS is usually the smallest possible as only cancer involved skin is removed. The smallest wound usually translates into the smallest scar and faster healing. For additional details on Mohs Surgery, please click http://mohsdermhouston.com/surgical-dermatology/mohs-micrographic-surgery/

Disadvantages (Mohs Surgery):

Despite its many advantages, Mohs surgery should not be applied for every skin cancer. The meticulous nature of Mohs surgery is time intensive. It also requires expertly trained physicians who can function as both surgeons and pathologists. Depending on the cancer, one tumor may require several hours to an entire day to clear and repair. Some cancers are not accurately seen with the frozen sections in Mohs surgery. Others are too large or are inaccessible with outpatient techniques. While local anesthesia is sufficient for most Mohs patients, others may require general anesthesia (Mohs surgery is routinely not done with general anesthesia). Finally, cancers that have already spread to lymph glands or elsewhere are not treatable with this technique.

TEXAS SURGICAL DERMATOLOGY PA

Experience, Excellence, Commitment

Experience the Excellence in Dermatology

P: 832-663-6566 **F:** 832-663-6550

www.tsderm.com

21009 Kuykendahl Rd, Suite A. Spring, Texas. 77379

TEXAS SURGICAL DERMATOLOGY PA
Experience, Excellence, Commitment

Radiation Therapy (RT)

How it works:

RT utilizes high-energy photons (x-rays) to destroy tissue. Rapidly dividing cells (cancer tissue) are more susceptible to RT but some nearby tissue is also affected. The RT targets the tumor site as well as a surrounding safety margin (radiation field = tumor site + safety margin). Shields are custom fabricated to protect as much of the non-targeted tissue as possible. Depending on the radiation dosage, several visits per week for many weeks are needed. RT is often "fractionated", meaning that the total radiation dose is divided into multiple smaller doses. This fractionation not only enhances tumor destruction but also minimizes damage to healthy tissue.

Benefits:

Depending on the device and technique, RT may be tailored to be superficial or deeply penetrating. Therefore, a variety of tumors may be treated. Properly performed, RT can achieve both high cure rates and a very good cosmetic outcome. RT may be used as primary therapy in patients who cannot undergo surgery or if there are multiple lesions within one region. It is an excellent alternative to surgery when the operation itself may be too deforming or high-risk to the patient. RT may be used after surgery (postoperative adjuvant radiation) for very high-risk skin cancers (lymph node involvement, nerve involvement) to increase chances for tumor control. For patients who have persistently positive margins (residual cancer in tissue) despite surgery, RT may also be a good option. RT may be combined with chemotherapy (chemoradiation) for advanced tumors.

Disadvantages:

RT relies on precise photon delivery and dosing for effectiveness. The radiation techniques may vary significantly among different institutions. There is no tissue submitted for margin examination and effectiveness depends on the sensitivity of the tumor, the radiation dose, and penetration. Acute (short-term) and chronic (long-term) radiation dermatitis may become problems. Acutely, weeping wounds, blisters, pain, and burn-like reactions require intense wound care for healing. There is a 6-12 month delay (to allow for healing) before the effectiveness of radiation may be determined. Chronically, radiated skin is thinner, smoother, fibrotic (scar-like), and lighter in color. There is permanent hair loss and there is difficulty healing if the treated skin is injured. Rare complications may include necrosis of bone, contraction of structures, and secondary cancers may develop within fields of radiation. The risk of radiation-induced cancers is rare and usually does not occur until 20 years or more after radiation. As a result, radiation is usually not the first choice to treat skin cancers in younger patients.