A Guide for Patients and Their Families

PATIENT RESOURCE™ CANCER GUIDE

Understanding Dermatologic Reactions

- Includes a Comprehensive List of Possible Dermatologic Reactions
- Keys to Managing Treatment Related Skin Conditions Early to Reduce their Intensity
- Reviewed by a Distinguished Medical Advisory Board

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Patient Resource™ Cancer Guide
Understanding Dermatologic Reactions

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Skin reactions to chemotherapy are common among cancer patients. Most of the reactions are mild, but some can be severe. They include such side effects as rashes, dry skin, hair loss, darkening of the skin, sensitivity to sunlight, skin growths, and changes to fingernails and toenails. The more you understand what to expect in the way of skin reactions to chemotherapy and what to do about them, the better you will be able to manage these side effects.

Skin reactions are not the only side effects you may experience with chemotherapy, but they are probably the most common. As you go through your chemotherapy, you may experience some or none of these reactions.

When you start chemotherapy, track a list of the reactions you experience and when you experience them. See page 9 for a tracker you can use. If the reactions are severe (in other words, they affect your ability to care for yourself), you should discuss them with your healthcare team so that you can be provided with guidance on how to manage them. In all likelihood, as you receive additional rounds of chemotherapy, you may experience worsening of side effects, if they are not treated appropriately. That’s why it is helpful to discuss with your healthcare team ways to prevent them from happening again or to manage them early in order to reduce their severity. Contact your healthcare team if you develop any skin reactions during your treatment.

While this guide discusses skin reactions only, there are ways to manage other side effects of chemotherapy as well. With appropriate management of side effects, you can get the benefits of the full dose of chemotherapy planned for you. On the next page you will find thorough descriptions of chemotherapy, the skin, and a list of possible skin reactions. Throughout this guide you can easily identify the reaction you may experience and find helpful hints for managing it.

Figure 1: Anatomy of skin.
Cancer is treated in a variety of ways today. Depending on what type of cancer you have and at what stage it was diagnosed, your treatment may involve surgery, radiation therapy, chemotherapy, hormonal therapy, biologic therapy, or a combination of treatments. Chemotherapy destroys rapidly dividing cancer cells, but many normal cells in your body, such as blood cells and cells in your mouth, nails, hair and skin, also divide rapidly. That’s why chemotherapy can affect these normal cells. Cancer treatment is not easy. But by working with your oncologist and other members of your healthcare team, you will learn how to take care of the side effects and improve your quality of life.

Side effects of chemotherapy depend on many factors, such as the type of medications you are given, dose or amount you’re given at any particular time, length of time over which you receive it, and your general health. The side effects of chemotherapy also vary among individuals. Knowing how to take care of any side effects of therapy is important because it allows you to lead as normal a life as possible and to receive the full treatment your doctor has planned for you. This guide will discuss the main skin-related side effects that you might experience and provide guidance in how to manage them. A small description of the structure and function of the skin will help you to understand why caring for your skin is important.

**Your Skin**

The skin is the largest organ in the body, and it has many functions, including protecting you from sunlight and infectious germs, allowing feelings of touch and sensation and regulating your body temperature.

Your skin has three layers: the epidermis, dermis, and a fat layer. Each layer has different functions. Underneath the epidermis, the outer layer of skin, are nerves, nerve endings, glands, hair follicles, and blood vessels (see Figure 1, page 1).

**Epidermis:** This is the thin outer layer of the skin that contains cells called keratinocytes. The outermost portion of the epidermis (the stratum corneum) is more or less waterproof and prevents bacteria, viruses, and other foreign substances from entering the body. That is why it is important to take care that your epidermis does not develop cracks. This layer also helps protect internal organs against any injury. Cells called melanocytes, which produce a pigment (color) called melanin, are scattered in this layer. The amount of melanin gives your skin its color and is important because it blocks the ultraviolet rays of the sun, which are known to damage the skin.

**Dermis:** This layer is under the epidermis and gives the skin its flexibility and strength. Nerve endings, sweat and oil glands, hair follicles, and blood vessels are present in this layer.

- Nerve endings provide sensations of touch, pain, pressure, and temperature.
- Sweat, produced by the sweat glands, is a mixture of chemicals with salt and water. Sweat helps cool the body, when it evaporates.
- Oil glands keep the skin moist.
- Hair follicles are the source of hair on a person’s body.
- Blood vessels of the dermis provide nutrients to the skin and help regulate body temperature.

**Hypodermis (Fatty Tissue):** Below the dermis lies a layer of fat cells that helps protect your body from heat and cold. It serves as a place to store energy and provides protective padding for the internal organs. Its thickness can vary from a fraction of an inch at the eyelids to several inches at the buttocks.
Acne-like rashes appear on the face, scalp, and upper trunk (see Figure 2). These rashes are not true acne — they are usually sterile and contain no bacteria. The rash is uncomfortable and can be severe enough to decrease or stop treatment. The rashes are often taken as a sign that the chemotherapy is working and are associated in three out of four individuals with medications called targeted therapies, which block specific molecules that are essential for cancer cells, but are also active in the skin, hair, and nails.

In a survey of doctors who prescribed targeted therapies for their cancer patients, 8 out of 10 physicians reported that they withheld treatment for a short time and 3 out of 10 discontinued treatment altogether. The pain, itching, and effect on appearance related to these rashes can negatively impact quality of life for individuals receiving targeted treatments. Symptoms include a stinging/burning sensation, itching and irritation, or pain. That’s why it is important to actively manage this reaction to improve your quality of life and make sure that your medicine can be given at the optimal dose.

Managing Acneiform Rash

There are several options you can use to prevent and treat the acneiform rash, including the use of topical and oral antibiotics or corticosteroids. It is important that you do not use certain medicines that are used to treat acne, such as topical retinoids, because these may dry or irritate the skin even more. In addition, because exposure to sunlight may aggravate the reaction, you should use broad-spectrum sunscreens.

If your healthcare team thinks you may develop acneiform rash because of the cancer drugs you are taking, use corticosteroids and topical or oral antibiotics as a preventive measure to protect you from developing serious skin problems. Protecting the skin is important because it keeps the skin healthy and prevents it from getting itchy and dry, which may be enough for bacteria to get through the skin. One study showed that significant acne-like rash can be cut in half by taking antibiotics.

Depending on the severity of the symptoms, your physician may recommend medicines that are being investigated in clinical studies. Treatment depends on how serious the rashes are, as summarized in the table below.

### Figure 2: Most common areas affected by acneiform rash.

<table>
<thead>
<tr>
<th>Type of Reaction</th>
<th>Treatment Suggestions</th>
</tr>
</thead>
</table>
| Mild (these reactions are generally confined to one area) | ▶ Topical corticosteroids (hydrocortisone, alclometasone) or antibiotics (clindamycin, erythromycin, mupirocin).  
▶ Oral tetracycline antibiotics, such as doxycycline or minocycline. |
| Moderate (these reactions have spread or affect one’s sense of self-esteem) | ▶ Topical corticosteroids (hydrocortisone, alclometasone) 4-week course of oral tetracyclines (100 mg doxycycline or 100 mg minocycline twice daily). |
| Severe (these reactions interfere with one’s daily activities and are intolerable) | ▶ Short course of oral corticosteroids, such as methylprednisolone, prednisone, or dexamethasone.  
▶ Chemotherapy may be discontinued for 7 to 10 days, and given again at a lower dose.  
▶ Even if cancer treatment is stopped, steroid cream and oral tetracycline are recommended as for individuals with moderate reactions.  
▶ Oral isotretinoin may be used in individuals who fail to respond to other medicines; if you have to use this option, please discuss the side effects of this therapy with your healthcare team. |

It is important to remember that the measles-like rash can be caused by various other medications, including antibiotics, over-the-counter pain medications (such as ibuprofen), anti-seizure medications, or those used for high blood pressure.

**Medications associated with measles-like rashes:**

<table>
<thead>
<tr>
<th>bendamustine (Treanda)</th>
<th>everolimus (Afinitor)</th>
<th>nilotinib (Tasigna)</th>
</tr>
</thead>
<tbody>
<tr>
<td>carboplatin (Paraplatin)</td>
<td>fluorouracil (Adrucil)</td>
<td>paclitaxel (Taxol)</td>
</tr>
<tr>
<td>cisplatin (Platinol)</td>
<td>imatinib (Gleevec)</td>
<td>sorafenib (Nexavar)</td>
</tr>
<tr>
<td>dasatinib (Sprycel)</td>
<td>ipilimumab (Yervoy)</td>
<td>temsirolimus (Torisel)</td>
</tr>
<tr>
<td>doxorubicin (Adriamycin, Doxil)</td>
<td>lenalidomide (Revlimid)</td>
<td>vemurafenib (Zelboraf)</td>
</tr>
</tbody>
</table>

**Type of Reaction**

- **Mild (these reactions are generally confined to one area)**
- **Moderate (these reactions have spread or affect one’s sense of self-esteem)**
- **Severe (these reactions interfere with one’s daily activities and are intolerable)**

**ACNEIFORM (ACNE-LIKE) RASH**

**MEASLES-LIKE RASH**

The most common type of rash that can develop from a chemotherapy is a measles-like (red bumps and spots) rash. It usually appears within the first few weeks after taking a medication, and starts on the neck, chest, and stomach, and then may spread to the arms and legs. It is usually itchy, and the skin may feel hot and swollen.

In the majority of cases, this rash is not life-threatening, and can be treated with medications, so that anticancer treatments may continue. In most cases, treatment consists of topical (triamcinolone, fluocinonide) or oral corticosteroids (prednisone, dexamethasone, or methylprednisolone) used twice daily. The chemotherapy can continue at the same dose or one that is considered to be safe by your doctor. Your doctor may also recommend for you to stop the chemotherapy for several weeks until the rash improves or resolves.

It is important to remember that the measles-like rash can be caused by various other medications, including antibiotics, over-the-counter pain medications (such as ibuprofen), anti-seizure medications, or those used for high blood pressure.

**Medications associated with measles-like rashes:**

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<td>vemurafenib (Zelboraf)</td>
</tr>
</tbody>
</table>
Hair loss, also called alopecia, affects many cancer patients receiving chemotherapy. Whether it occurs or how severe it is will depend on the medicines you receive and their doses. But hair loss can be the most distressing side effect because it affects your self-image. It often starts about 7 to 10 days after treatment and progresses as you receive additional chemotherapy cycles over time. The hair loss may occur anywhere on the body, including the eyelashes, eyebrows, or even the pubic areas.

The good news is that hair loss is temporary and the hair will regrow once therapy is stopped. But the hair may grow back differently with a different color or texture. Some drugs such as cyclophosphamide, docetaxel, and paclitaxel may be associated with permanent hair loss.

On the other hand, with some of the newer types of treatments, such as erlotinib, cetuximab, panitumumab, sorafenib, and vemurafenib, the hair progressively becomes thin, curly, and dry, but does not completely fall out, and this type of hair thinning is usually temporary.

Managing Hair Loss
If you will be receiving a chemotherapy that causes significant hair loss, you may decide to apply Minoxidil twice daily to your scalp to reduce the duration of the hair loss. Your doctor may check blood levels of certain hormones that contribute to hair growth. Here are some suggestions to help you manage hair loss:

▶ Use a soft bristle brush and avoid too much brushing or pulling of hair.
▶ Wash your hair with mild, gentle shampoos and conditioners; rinse hair thoroughly and gently pat dry to avoid damaging your hair.
▶ Avoid coloring, perming, or relaxing the hair for 2 months after completing chemotherapy.
▶ Do not use hair dryers, electric rollers, or a curling iron.
▶ Try not using clips, barrettes, elastic bands, bobby pins, or hair sprays.
▶ Sleep on a satin pillowcase.

Managing your hair loss depends on your own comfort level with baldness and on keeping your scalp warm (if you live in a cold climate) and protecting it from the sun. Look Good...Feel Better is a non-medical, brand-neutral public service program from the Personal Care Products Council Foundation (www.lookgood-feelbetter.org) that provides services for people undergoing cancer treatment to help manage hair loss. If hair loss is something that worries you, discuss your concerns with your healthcare team because alternative medicines that do not cause hair loss may be available. The table below discusses the use of wigs, caps, scarves, and products for hair loss.

<table>
<thead>
<tr>
<th>Medications associated with hair loss or thinning:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carboplatin</strong> combined with cyclophosphamide</td>
</tr>
<tr>
<td>Cetuximab (Erbitux)</td>
</tr>
<tr>
<td>Cisplatin (Platinol)</td>
</tr>
<tr>
<td>Cyclophosphamide (Cytoxan)</td>
</tr>
<tr>
<td>Dactinomycin (Cosmegen)</td>
</tr>
<tr>
<td>Docetaxel (Taxotere)</td>
</tr>
<tr>
<td>Doxorubicin (Adriamycin)</td>
</tr>
<tr>
<td>Epirubicin (Ellence)</td>
</tr>
<tr>
<td>Erlotinib (Tarceva)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short hair</strong></td>
<td>▶ Consider cutting your hair short if you are expecting hair loss during treatment. Hair can fall off unevenly and that’s why cutting your hair short may be less distressing. Some individuals even shave their head before chemotherapy.</td>
</tr>
<tr>
<td><strong>Wigs</strong></td>
<td>▶ If you consider a wig an option, consider getting one before you begin chemotherapy. You may want to get a prescription from your doctor if your insurance covers a “cranial prosthesis.”</td>
</tr>
<tr>
<td><strong>Caps and scarves</strong></td>
<td>▶ Caps and scarves may be the easiest option for you. You probably already own some you can use.</td>
</tr>
<tr>
<td><strong>Lotions</strong></td>
<td>▶ Apply 2% or 5% minoxidil (Rogaine) twice a day during chemotherapy. Be aware that hair may grow in undesirable areas. ▶ Minoxidil is also available as a foam, which may be easier to apply if there is a lot of hair. ▶ If the scalp is itchy, a topical corticosteroid as a shampoo, foam, or liquid can be prescribed by your doctor.</td>
</tr>
<tr>
<td><strong>Vitamins</strong></td>
<td>▶ Biotin (vitamin B7), 2.5 mg (or 2,500 mcg) every day.</td>
</tr>
</tbody>
</table>
The hand-foot syndrome is a common condition characterized by pain, swelling, and tightness or redness of the palms of the hands or soles of the feet, with or without painful blisters.

Managing Hand-Foot Syndrome

If you experience hand-foot syndrome when chemotherapy is given through a vein (intravenously), your healthcare team may decide to cool your hands and feet during therapy to help prevent this side effect from happening. You can also change how you perform some of your daily activities. Details are summarized in the table below.

### Medications associated with hand-foot syndrome:
- capecitabine (Xeloda)
- paclitaxel (Taxol, Abraxane)
- cytarabine (Cytosar)
- pazopanib (Votrient)
- docetaxel (Taxotere)
- sorafenib (Nexavar)
- daunorubicin (Cerubidine)
- sunitinib (Sutent)
- doxorubicin (Adriamycin, Doxil)
- vemurafenib (Zelboraf)

### Options

#### Changing your daily activities
- Avoid long-time exposure to hot water (for example, washing dishes, showers).
- Take short showers in tepid water.
- Use a hand and foot moisturizer with urea every day during chemotherapy.
- Avoid pressure on the soles of the feet or palms of hands, especially during the first month: avoid long walks, jogging, aerobics, jumping, gardening, household work that involves chopping food and using tools such as screwdrivers.
- Wear cotton or leather gloves when using your hands for sports, hobbies, or working, and thick cotton socks when walking or running.
- Do not walk barefoot, use soft slippers or shoes with a rubber sole.
- Use moleskin or molefoam padding for your feet when areas rub against shoes.

#### Cooling procedures
- Place ice packs on your palms or soles of your feet 20 minutes at a time. If you are receiving an intravenous chemotherapy (paclitaxel, docetaxel, doxorubicin), place palms and soles over ice packs during the duration of each infusion.
- Do not rub them vigorously.
- Use moisturizing creams such as Aveeno®, Lubriderm®, Am-Lactin®, Udder Cream®.
- For painful areas, your doctor may prescribe creams or ointments containing corticosteroids to decrease pain and inflammation (such as clobetasol or fluocinonide), or with anesthetics to numb the painful areas (lidocaine, benzocaine). If the skin becomes thick or calluses form, your doctor may prescribe creams with exfoliants (containing urea, ammonium lactate, or salicylic acid).

#### Creams or ointments

- Use acetaminophen such as Tylenol®.
- Check with your doctor if you require stronger medicines, including codeine-related medications or non-steroidal anti-inflammatories (ibuprofen, naproxen, celecoxib).

#### Pain relief

- No vitamins have been shown to help with hand-foot syndrome.

### Increased Sensitivity to Sunlight (Photosensitivity)

Some chemotherapies increase skin’s sensitivity to light, causing sunburns with minimal exposure to the sun.

Managing Photosensitivity

If your doctor indicates that photosensitivity could be a side effect of your chemotherapy, you should protect yourself from the sun by using sunscreen and protective clothing when you go out into sunlight. If your skin is already red and painful, your doctor may prescribe a topical corticosteroid and recommend anti-inflammatory medications (ibuprofen, naproxen).

Physical sunscreens have millions of particles of minerals, such as titanium dioxide and zinc oxide, that act like mirrors. Look for titanium dioxide or zinc oxide on the label of the bottle. Physical sunscreens are the best protection from the sun. Use a broad-spectrum sunscreen with an SPF (sun protection factor) of at least 15, and apply generously over exposed areas every two hours, or more frequently if swimming or sweating.

### Medications associated with photosensitivity:
- all-trans retinoic acid (ATRA)
- fluorouracil (Adrucil)
- capecitabine (Xeloda)
- methotrexate (Rheumatrex, Trexall)
- cetuximab (Erbitux)
- panitumumab (Vectibix)
- dacarbazine (DTIC-Dome)
- vandetanib (Caprelsa)
- erlotinib (Tarceva)
- vemurafenib (Zelboraf)
Dry skin is commonly found in people living with cancer, even before treatments are started. Dry skin is more frequent when the weather is cold and dry, as in the winter months. Dry skin allows for more water loss from the body, and it may lead to itching and scratching. Most chemotherapies can cause dry skin, since the ability of skin to renew itself is slowed down. Dry skin is more evident in the palms and soles, where it can appear as cracks or fissures, which may even be painful (see Figure 3). In general, using a cream or an ointment is better than lotions, since they are better able to retain the moisture in your skin. Several key points will help keep your skin moisturized:

▶ Apply creams or ointments at least twice a day.
▶ Application should occur within 15 minutes of showering or bathing.
▶ Use lukewarm or warm water for showers or baths, which should be kept brief.
▶ Avoid fragranced soaps and detergents.
▶ Avoid loofahs, scrubs or sponges in the shower or bath.
▶ Use creams with few or no irritating ingredients for the body and face.
▶ For thick, scaly areas, use creams containing urea, ammonium lactate or salicylic acid.
▶ For cracks or fissures in the fingertips and heels, apply thick creams containing zinc oxide (Desitin®) at least four times a day. To retain moisture, use cotton gloves after applying creams at night.

Figure 3: Dry skin and flaking.

Itching is one of the most common symptoms reported by cancer survivors after their treatment. Certain types of cancer, such as lymphomas, can cause itch, but most of the time chemotherapy causes an itch. When the itch affects the ability to do daily activities or sleep, it can become a significant problem.

Managing Itch

Avoid anything that can irritate the skin, so avoiding fragranced soaps, creams or detergents is very important. It is also important to avoid scratching. Creams or lotions containing menthol, camphor or pramoxine can be obtained over the counter and applied many times a day to relieve itch. Also, over the counter antihistamines (such as cetirizine, fexofenadine, diphenhydramine) can help relieve the itch. Your doctor may prescribe oral antihistamines or topical or oral corticosteroids when itch becomes resistant to over-the-counter preparations.

<table>
<thead>
<tr>
<th>Medications associated with itching:</th>
</tr>
</thead>
<tbody>
<tr>
<td>cetuximab (Erbitux)</td>
</tr>
<tr>
<td>erlotinib (Tarceva)</td>
</tr>
<tr>
<td>gefitinib (Iressa)</td>
</tr>
</tbody>
</table>

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Mouth sores, or mucositis, can occur inside the mouth, which contains cells that are rapidly dividing.

Symptoms of mouth sores begin when there is a burning sensation in the mouth followed by redness and sores. Symptoms can range from redness and soreness in the mouth and gums to open sores that make eating difficult.

**Medications associated with mouth sores:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Drug</th>
<th>Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>alemtuzumab (Campath)</td>
<td>etoposide (VePesid, Toposar, Etopophos)</td>
<td>methotrexate (Rheumatrex, Trexall)</td>
</tr>
<tr>
<td>asparaginase (Elspar)</td>
<td>everolimus (Afinitor)</td>
<td>mitomycin (Mutamycin)</td>
</tr>
<tr>
<td>busulfan (Myleran)</td>
<td>fluourouracil (Adrucil)</td>
<td>mitoxantrone (Novantrone)</td>
</tr>
<tr>
<td>capecitabine (Xeloda)</td>
<td>gemicitabine (Gemzar)</td>
<td>oxaliplatin (Eloxatin)</td>
</tr>
<tr>
<td>carboplatin (Paraplatin)</td>
<td>gemtuzumab ozogamicin (Mylotarg)</td>
<td>paclitaxel (Taxol)</td>
</tr>
<tr>
<td>cetuximab (Erbitux)</td>
<td>hydroxyurea (Hydrea, Droxia)</td>
<td>pentostatin (Nipent)</td>
</tr>
<tr>
<td>cyclophosphamide (Cytoxan)</td>
<td>idarubicin (Zavedos)</td>
<td>procarbazine (Matulane)</td>
</tr>
<tr>
<td>cytarabine (Cytosar-U)</td>
<td>interleukin 2 (Proleukin)</td>
<td>thiotepa (Thioplex)</td>
</tr>
<tr>
<td>daunorubicin (Cerubidine)</td>
<td>irinotecan (Camptosar)</td>
<td>topotecan (Hycamtin)</td>
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<td>docetaxel (Taxotere)</td>
<td>lomustine (CeeNU)</td>
<td>vinblastine (Vinblastin)</td>
</tr>
<tr>
<td>doxorubicin (Adriamycin)</td>
<td>mechlorethamine (Mustargen)</td>
<td>vincristine (Oncovin)</td>
</tr>
<tr>
<td>epirubicin (Ellence)</td>
<td>melphalan (Alkeran)</td>
<td></td>
</tr>
</tbody>
</table>

**Managing Mouth Sores**

The pain from mouth sores has far-reaching effects on your nutritional status when the discomfort and pain prevent you from eating. If the results are life threatening, you will require feeding tubes. The table below summarizes some ways in which you can control symptoms.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Treatment Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routine oral care</strong></td>
<td>- Remove dentures.</td>
</tr>
<tr>
<td></td>
<td>- Clean mouth and teeth gently with a soft toothbrush, cotton swab or mouth swab.</td>
</tr>
<tr>
<td></td>
<td>- Rinse mouth with salt or baking soda.</td>
</tr>
<tr>
<td></td>
<td>- Use gentle mouthwashes regularly (your doctor will let you know which ones are good for you).</td>
</tr>
<tr>
<td></td>
<td>- Ice chips.</td>
</tr>
<tr>
<td></td>
<td>- Topical local anesthetic solutions or jelly (lidocaine).</td>
</tr>
<tr>
<td></td>
<td>- Oral analgesia or intravenous analgesia with opioids prescribed by your doctor.</td>
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<td>- Medicated mouthwashes to decrease inflammation (dexamethasone) and yeast infections (nystatin).</td>
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<td><strong>Enhance healing</strong></td>
<td>- Apply Kenalog in Orabase® Ulcerase® to irritated areas on the tongue, mouth or on lips.</td>
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<td>- Maintain good nutrition (for example, high protein and high calorie foods, which are soft and/or semi-liquid. Liquid supplements such as Boost and Ensure can also be used.</td>
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<td><strong>What to avoid</strong></td>
<td>- Hot, spicy, coarse, or rough-textured foods.</td>
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<td>- Very hot or cold beverages and foods.</td>
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<td>- Citric juices or foods containing acid (such as tomatoes, oranges, lemon).</td>
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<td>- Alcoholic beverages or tobacco products.</td>
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<td>- Liquid medication containing alcohol (such as some cough medicine) if not essential.</td>
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Cancer chemotherapy can alter your fingernails and toenails in a number of different ways.

▷ A groove across the nail plate.
▷ The nail plate separates from the nail bed underneath.
▷ The nail may be entirely lost.
▷ There may be pain, thickening and/or thinning of the nail.
▷ The nail may get pale or dark streaks.
▷ The skin around the nail may get inflamed or painful (see Figure 4).

Managing Nail Changes

Nail changes associated with these medicines are often difficult to avoid, but if you have a history of nail changes, you may be given cold gloves and slippers to wear during chemotherapy with docetaxel or paclitaxel. Using cold gloves and slippers shrinks blood vessels in your hands and feet, resulting in less medicine delivered to these areas. You may also use ice packs for your hands and feet if cold gloves or slippers are not available. Using cold gloves and slippers has not been shown to be effective with other types of chemotherapy.

Often nail changes disappear when new nails replace damaged nails. When nail changes are painful or there is fluid draining, it may indicate an infection, so your doctor may prescribe antibiotics. Also, there are some things you can do to cope with this reaction:

▷ Trimming fingernails and toenails.
▷ Wearing gloves when working (for example, when gardening or cleaning or washing dishes).

Other Skin Reactions

Radiation reactions: You may experience redness of the skin with radiation therapy for your cancer. This can be prevented by the daily application of a topical corticosteroid (such as mometasone), which will decrease itching and pain. If there are any blisters or open areas, antibiotics may be prescribed by your doctor to be used topically or orally.

People receiving radiation for head and neck, breast, genital, and rectal cancer are more susceptible to radiation skin reactions. The reactions may be even more severe if chemotherapy is being given at the same time (for example, cetuximab). In these cases, starting an oral antibiotic (doxycycline or minocycline) and a topical corticosteroid (mometasone), which will decrease itching and pain. If there are any blisters or open areas, antibiotics may be prescribed by your doctor to be used topically or orally.

Oral antihistamines can decrease itching. Bleaching agents also cause excessive darkening of the skin, nail, and the oral cavity.

Skin reactions to chemotherapy leaks:

Some chemotherapies that are given through a vein or artery leak into the skin tissue. As a result, the cells in the skin tissue die. Some cancer drugs cause veins and tissue underneath the skin cells to become inflamed; other medicines result in severe damage of skin as well as ulcers and scar formation.

Most chemotherapies given through the veins or arteries are capable of causing skin necrosis; of these medicines, doxorubicin is one that also causes ulcers. Depending on the chemotherapy drug you are given, you may be given cold packs or heat packs to help in wound healing.

▷ Avoiding the risk of infection by not getting manucures, pedicures or cutting your cuticles; artificial nails should also be avoided.
▷ Using dark nail polish to help hide the discoloration; but it is important not to change your nail polish frequently because nail polish removers are harsh.
▷ Soaking hands in natural oils, such as olive oil, may be helpful.
▷ Wearing comfortable, loose-fitting shoes helps.

You can treat nail changes by applying an antibiotic (polysporin, mupirocin) or an antiseptic gel (for example, betadine gel or iodine gel). These medications are available over the counter. When applying iodine gel, it is advisable to cover your affected nail with a fingertip bandage because of the dark color of iodine. Soaking fingers and toes in a solution of one part vinegar and one part cool tap water once a day for 15 minutes is also helpful. If the problem persists, you may need to see a dermatologist.

Figure 4: Inflammation around nails.

Medications associated with nail changes:
- capcitabine (Xeloda)
- cetuximab (Erbitux)
- docetaxel (Taxotere)
- doxorubicin (Adriamycin, Doxil)
- eribulin (Halaven)
- erlotinib (Tarcvea)
- lapatinib (Tykerb)
- paclitaxel (Taxol)
- panitumumab (Vectibix)

Excessive darkening of the skin:

Drugs such as bleomycin, capcitabine, and fluorouracil cause a darkening in the skin. If you develop dark discoloration, you may begin to itch and scratch the skin, resulting in dark lines. Other medications, such as fluorouracil, vinorelbine, and daunorubicin, also cause excessive darkening of the skin, nail, and the oral cavity.

Oral antihistamines can decrease itching. Bleaching agents or oral corticosteroids applied on the skin can decrease melanin production and can help to decrease hyperpigmentation. The reaction slowly disappears once treatment is stopped. Sunscreen use is always a must, since even indoor lights can cause darkening.

Skin growths or bumps:

Some chemotherapies can cause an unexpected reaction consisting of growths in the skin. Medications that cause these growths are sorafenib (Nexavar) and vemurafenib (Zelboraf). Approximately 20% of people on these medications will develop small, wart-like growths on the upper body, including the face. Whereas most of these growths are just of cosmetic importance, your doctor may need to burn or remove and biopsy them to make sure they are not a form of skin cancer.

In any event, these growths can be removed easily by a dermatologist and should not affect your health or ability to continue anticancer treatments.
Additional Sources of Information

**www.harborsidepress.com/skincare**
This book contains practical information to help patients cope with skin reactions, which can range from mild and annoying to serious enough to affect health, treatment, and quality of life. *Dr. Lacouture’s Skin Care Guide for People Living With Cancer* was written by one of the foremost experts on the dermatologic side effects of cancer treatments.

**www.cancer.gov**
The website of the National Cancer Institute offers information on many topics associated with cancer — its diagnosis, treatment, side effects of therapy, management of side effects and clinical trials.

**www.cancer.org**
This American Cancer Society website provides information about cancer, its risk factors, prevention, treatment and more.

**www.cancer.net**
Oncologist-approved cancer information from the American Society of Clinical Oncology.

**www.cancercenter.com**
This website from the Cancer Treatment Centers of America offers information on cancer, its treatment and side effects, and how to manage side effects.

**www.cancersupportivecare.com**
The website for Cancer Supportive & Survivorship Care offers educational information to complement surgery, radiation, chemotherapy, hormonal therapy and immunotherapy, and improve survivorship.

**www.cancersymptoms.org**
This website is dedicated to helping you find out more information about various symptoms that could lead to early detection of cancer.

**www.chemocare.com**
Chemocare.com is a program of the Scott Hamilton CARES initiative designed to provide the latest information about chemotherapy to patients and their families, caregivers and friends.

**www.LookGoodFeelBetter.org**
This website is dedicated to improving self-esteem and quality of life for people undergoing cancer treatment. Its aim is to improve patient’s self-image and appearance through complimentary group, individual, and self-help beauty sessions that create a sense of support, confidence, courage and community.

**www.LiveStrong.com**
This is an educational website of the Lance Armstrong Foundation.

**www.oncolink.org**
This website from the Abramson Cancer Center of the University of Pennsylvania offers reliable and comprehensive information about cancer types, treatments and drugs.

**www.PatientResource.com**
This content is available at PatientResource.com as a pdf download. In addition, information about cancer treatment and all side effects is available here.

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### A Symptom Tracker to Help You

This symptom tracker will help you make note of the side effects that you may experience. Each week, note the day when side effects occurred after you received chemotherapy. You may want to use the notes column to list how severe the reaction was and how you managed it. Chemotherapies are given every three or four weeks. If your chemotherapy is given every three weeks, you will not use the column for Week 4.

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<thead>
<tr>
<th>CYCLE 1</th>
<th>Side effect</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
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