

Skin Cancer Foundation Photosensitivity Report

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Introduction

Photosensitivity Basics

Photosensitivity is an increased sensitivity or abnormal response of the skin to sunlight or artificial light. In particular, both UVA radiation (longer wavelengths) and UVB radiation (shorter wavelengths) have been observed to trigger unusual reactions of the skin in people with certain disorders or those who are taking particular medications.

The most common manifestation of an increased photosensitivity is the appearance of lesions of various shapes and sizes on areas of the skin that have been exposed to sunlight. The time required for such a response to occur can be anywhere from under 30 minutes of exposure to sunlight to hours spent in it.

When a person suffers from an exaggerated sensitivity to sunlight, he or she most often will exhibit some form of dermatitis (a rash caused by an allergy or physical contact with a particular substance) on the part of the body that was exposed to light. Thus, naturally hidden body parts such as the skin of the upper eyelid or areas covered in hair such as the scalp are better protected and do not produce such rashes.

The most effective way to protect your skin and prevent damage to it, regardless of whether or not you have a photosensitivity disorder, is to minimize exposure to direct sunlight. Application of a high SPF sunscreen to all exposed areas and wearing protective clothing are also important practices in defending your skin from the sun's harmful UV rays.

Willis, Isaac. "Photosensitivity and Phototherapy." Dermatology in General Medicine. Second ed. 1 vols. New York: McGraw-Hill, Inc., 1979.

<http://www.dermnetnz.org/reactions/photosensitivity.html>

Phototoxic Reactions versus Photoallergic Reactions

When a person experiences a photosensitivity reaction they actually undergo one of two separate reactions, known as either a *phototoxic* reaction or a *photoallergic* reaction. In a phototoxic reaction, which is much more common than a photoallergic response is, a change in the skin is usually observed within minutes to hours following exposure to the offending substance. As for photoallergic reactions, however, a response is not observed for 1 - 3 days after the substance has come into contact with the body.

Phototoxic reactions are the result of a release of energy by photosensitizing agents, causing potentially long term damage to the skin surrounding these molecules. This excessive energy is initially absorbed by the molecules from the sun's ultraviolet rays, explaining how sunlight can indirectly result in the death of skin cells. Although the medication or agent that causes the reaction might be stopped quickly, such a reaction can occasionally last 20 years after the substance has been removed. Medications that are taken orally, topically (i.e. a cream applied to the skin) or injected can all cause phototoxic reactions

Photoallergic reactions, as mentioned, are much less common. These responses are specifically caused by topical medicines or photosensitizing agents. As hinted by the name of the reaction, photoallergic responses occur when UV rays cause the shape of a molecule to transform into a new substance, eliciting a response of the immune system to attack these foreign antigens. As antibodies are produced and attack the photosensitizer a rash develops, usually a few days following application of the substance. The outbreak is not limited to sun exposed areas but can spread to all parts of the body.

<http://www.webmd.com/a-to-z-guides/sun-sensitizing-drugs>

Diseases Related to Abnormal Photosensitivity Responses of the Skin

1. Actinic Folliculitis
2. Actinic Prurigo
3. Bloom Syndrome
4. Chronic Actinic Dermatitis
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Actinic Folliculitis

Actinic folliculitis is a dermatosis that results in patches of small (1 to 3 mm) raised bumps on the skin that can be pink or pale in color. These rashes are often found on the face, neck or trunk and appear four to six hours following exposure to sunlight. Most regularly used acne treatments are not very effective in minimizing this outbreak, but oral isotretinoin can be effective.

This disorder is very rare and is related to other acne disorders such as acne aestivalis and actinic superficial folliculitis.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic." Dermatology in General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

Actinic Prurigo

Actinic prurigo is a disorder that produces rashes consisting of tiny itchy red dots (papules). The eruption produced tends to resemble eczema (atopic dermatitis) but is usually more severe. These lesions are usually most intense on skin that has been exposed to UV radiation such as the face, neck, arms, and upper chest. A more mild reaction can sometimes be observed on those parts of the body that are hidden from the sun. In 60-70% of patients a rash develops on the lips and conjunctiva of the eyes is found in 45%.

Actinic prurigo can last all year long with rashes sometimes taking weeks or months before they subside. Occasionally lesions will appear in the winter, although outbreaks tend to be most intense during months when the skin is most exposed to ultraviolet radiation. In certain patients the rash will be the most severe in the months prior and following peak UV exposure due to the skin's ability to become more tolerant as exposure to sunlight approaches its peak. As the lesions remain on the skin for long periods of time, sunshine tends to aggravate pre-existing rashes rather than produce new ones.

People with darker skin most often develop this disease, especially the Native Americans of Mexico, Central America, and Southern America. Those suffering from the disorder will usually develop their first rashes by ten years old. Those that experience later onsets of the disorder are twice as likely to be female.

Damage done to exposed skin does not seem to be minimized when using sunscreens, including those that have high SPFs. Because normal sun protectors are not very effective in reducing the likelihood of an outbreak, the best way to prevent rashes is to avoid exposure to sunlight as much as possible. Thalidomide has been found to be effective in treating the disorder when prescribed at a low-dosage. This drug, however, is a teratogen, meaning it has the potential to harm a developing fetus, and should therefore be avoided during pregnancy.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic."
Dermatology in
General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetz.org/reactions/actinic-prurigo.html>

<http://www.emedicine.com/derm/topic927.htm>

Bloom Syndrome

Bloom syndrome (also known as telangiectatic erythema) is a rare inherited disorder that can result in the appearance of small red capillaries (telangiectases) on affected areas of skin, delayed growth at birth, small stature, immunodeficiency, infertility, mental retardation and an increased likelihood of developing cancer.

This genetic disorder follows an autosomal recessive pattern, meaning that both parents must donate a copy of the gene (in which case each parent is a carrier of the mutated gene) to their child, who has a 1 in 4 chance of being born with Bloom syndrome. The disease is believed to be the result of a mutation in the *BLM* gene, causing chromosomes to break and rearrange more often.

Bloom syndrome is a disorder that is most common in East European Ashkenazi Jews, but has also been found in people of Japanese descent. Men are slightly more likely to have the syndrome than women.

The most common first signal of Bloom syndrome is a small size at birth and a subsequent slow growth rate. As a person with Bloom syndrome ages, he/she will often develop certain symptoms of the disorder in addition to those already mentioned. These include a high-pitched voice, narrow face, prominent ears, small lower jaw, an enlarged nose, large hands and feet and disproportionate arms. Additionally, ailments including diabetes, pneumonia, and various infections are more common in people with this disorder.

An increased sensitivity to sun is very common in cases of Bloom syndrome. Rashes that form as a reaction to UV light are usually butterfly-shaped areas found on facial skin, hands, and arms. Dilated blood vessels are also very common. Cheilitis, or the drying and crusting of the lips, is common following irritation by the sun. Fortunately photosensitivity and erythema (inflammation and redness of skin due to irritation by the sun) decrease with age.

The probability of growing of a malignant tumor is 150% to 300% greater in these patients than it is in the normal population. In fact, 20% of people with Bloom syndrome develop

a malignant tumor at some point, often at a much younger age than the average person would. Diagnosis of such a tumor is made at an average of 25 years of age. This causes the average life span to be much lower in people with Bloom syndrome, often ending between 20 to 30 years due to the spread of malignant tumors. At age 22, leukemia is likely to develop and at 35 it is common for solid tumors to grow.

Because Bloom syndrome is a genetic disorder no treatment exists for it. As mentioned, the risk of cancer is greatly increased in those suffering from Bloom Syndrome, so monitoring the skin for growths and careful protection against sun irritation is crucial. Defense against UV rays includes minimizing exposure to sunlight, applying of a high SPF sunscreen, and wearing clothing that covers the skin from the sun's rays.

<http://www.dermnetnz.org/systemic/bloom.html>

<http://www.emedicine.com/derm/topic54.htm>

<http://ghr.nlm.nih.gov/condition=bloomsyndrome>

Chronic Actinic Dermatitis

Chronic actinic dermatitis (CAD) is a photosensitivity disorder in which outbreaks of eczematous rashes develop most often on exposed skin. Patients suffering from the disorder often suffer from papules, or inflamed bumps, and plaques, which are scaly, raised patches of skin. These rashes often itch and appear red in color. Nearly 90% of those suffering from CAD are males, and of these most are elderly.

Chronic actinic dermatitis refers to a number of related disorders, including persistent light reactivity, actinic reticuloid, photosensitive eczema, and photosensitivity dermatitis. The progression from one of these disorders to CAD is characterized by transition from a photoallergic contact dermatitis to a persistent photosensitivity.

It has been observed that, although the disorder can last all year long, its outbreaks become most severe during the summer months when the body is exposed to the greatest amount of UV radiation. The rashes are usually found on the backs of hands, scalps, face, and upper chest. In more extreme cases patients will have intense eruptions of papules and plaques on exposed areas of skin adjacent to other areas that are exposed yet remain healthy.

Treatment of CAD can take an extensive amount of work and involves strict avoidance of UV Radiation. In certain extreme cases patients are admitted to hospital dark rooms in order to completely avoid sunlight. If a contact dermatitis exists then this allergen must also be completely removed.

A number of medications provide a minimization of this hypersensitivity to sunlight. Azathioprine aids in the remission of the disorder after a few months. While this sometimes cures the disease, this treatment does not always last. In such cases annual treatments prior to summer can be helpful. High dose systemic or topical corticosteroids can be an effective addition to phototherapy, but the exposure to even minute amounts of UV Radiation can often irritate the skin. Cyclosporine, emollients, and topical tacrolimus are also effective treatments for this disorder.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic."
Dermatology in
General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetz.org/reactions/chronic-actinic-dermatitis.html>

Darier's Disease

Darier's disease is a rare chronic disorder also known as keratosis follicularis. It is hypothesized that a genetic defect forces calcium to remain outside of cells rather than entering them. This mineral, however, is required to properly construct desmosomes or 'cell connectors,' resulting in skin cells (keratinocytes) that do not stick together properly.

The disease follows an autosomal dominant genetic pattern, meaning that only one copy of the gene is needed to cause the disease. This also means that only one parent needs to have the disease in order to pass it on to his or her offspring. If a copy of the gene is acquired by a child, however, he or she will not necessarily develop any symptoms of the disease. If a parent does have the disease, a 50% chance exists that the offspring will inherit a copy of the gene, too.

Symptoms of Darier's disease include severe skin lesions whose severity fluctuates over time. These rashes tend to be coarse, greasy, scaly papules that are skin colored, yellow, or brown. The lesions often cover seborrheic areas of the face including the forehead, scalp, eyebrows, ears, nostrils, sides of nose, and beard area, as well as the neck and central chest and back. Skin that is covered by natural flaps occasionally develops wart like growths that have a strong odor.

Less common rashes include flat freckle-like lesions or large raised bumps that appear to be warts. Smaller warts or bleeding areas beneath the skin can also develop on soles of feet or palms. It is also common for straight red or white lines to run from the tip of the nail to the opposite end of it. Mucous membranes also tend to form papules or have a white border in those with the disorder.

Most people that show signs of Darier's disease will develop symptoms before age 30. In many mild cases these rashes and other indicators of the disorder will rarely appear unless instigated. Often UV radiation can cause outbreaks, so it is important that those with Darier's disease avoid direct sunlight, wear protective clothing that covers the legs and arms, and apply sunscreen on exposed skin. This is of even greater importance to those with severe cases of the

disorder. Bacterial infections or Herpes virus infections are other common sources of outbreaks, so taking any necessary antibiotics can play an important role in preventing outbreaks.

Treatment of Darier's disease is usually only necessary in severe cases. Minimization of lesions can be done through a process known as dermabrasion in which the skin is sanded down. Topical retinoids are also effective in treating rashes. In addition, oral retinoids such as acitretin, isotretinoin, and ciclosporin are useful in treating more severe cases.

<http://www.dermnetnz.org/scaly/darier.html>

<http://www.emedicine.com/derm/topic209.htm>

Dermatomyositis

Dermatomyositis (DM) is a rare muscle disease that belongs to a group known as 'inflammatory myopathies.' In addition to weakening muscles patients tend to develop skin rashes that can itch or burn.

Patients with DM develop a number of lesions throughout the body. These include red or bluish-purple patches on the cheeks, nose, chest, elbows and other sun-exposed areas. Heliotrope (purple eyelids), purple coloring of parts of the body where bones protrude, such as the knuckles (called Gottron's papules), ragged cuticles, amplified coloring of blood vessels on nail folds, loss of hair and a scaly scalp are all symptoms that are likely to develop before or at the same time as muscle weakness.

The most commonly affected muscles are those closest to the trunk of the body, which become tender and can ache while performing everyday activities. A common complication found in 40% of children is calcinosis, in which firm skin colored or yellow knots form over bony protrusions and can be easily infected.

Most of those with DM do survive but can become weak and disabled. If muscles become weak enough or malignancies develop, however, a chance of death does exist. Those with DM that are older than 60 have a heightened likelihood of growing tumors, making it crucial for patients to have any growths checked by a dermatologist.

In the United States approximately 5.5 people in every one million develop DM, with numbers increasing over past years. Women appear to be twice as likely to acquire DM as men are, but no trends in terms of race exist. While DM can occur at all ages, it peaks at age 50 in adults and between 5 and 10 years old in children.

In treating dermatomyositis, the foremost goal is to maintain weakening muscles. The most commonly prescribed medications are oral corticosteroids including prednisone, as well as diltiazem and colchicine for preventing calcinosis. Rest is also important for those with excessive inflammation of the muscles, but physical therapy is highly advisable for less severe cases.

Although the majority of patients do require lifelong treatment, approximately 20% of patients have completely resolved symptoms.

Hydroxychloroquine is often prescribed as it reduces the outbreak produced by photosensitivity. Proper sun protection habits are also essential in minimizing the spread of rashes. These behaviors include avoiding sun exposure when possible and applying high SPF sunscreens to all exposed areas. Wearing protective clothing can also be very helpful in reducing the likelihood of an outbreak.

<http://www.dermnetz.org/immune/dermatomyositis.html>

<http://www.emedicine.com/derm/topic98.htm>

Disseminated Superficial Actinic Porokeratosis (DSAP)

This disorder is characterized by the appearance of dry lesions by age 30 or 40 that increase in number as the patient ages. These lesions are often induced by exposure to sun and are associated with immunosuppression, which has led researchers to believe that UV Radiation might play a role in hindering the immune system.

Lesions begin as conical pointed papules (bumps) that are 1-3 mm in size and expand into red-brown 10mm raised circular lesions that are incapable of sweating. Often the rim of the lesion is dark brown with a pale bordering circle. Affected areas are usually the lower legs (especially in females) and arms, but rashes rarely form on the hands, face, or scalp.

DASP is a hereditary disease that follows an autosomal dominant pattern, meaning that children of those with the disorder have a 50% chance of inheriting the gene for it. Fair-skinned people, particularly Europeans, are most likely to suffer from DASP.

Treatment of the disorder is difficult as UVA and UVB photochemotherapy often induces more lesions rather than desensitizing the skin with the intention of inhibiting future outbreaks. It is important that patients with DASP take special precautions to protect their skin by using high SPF sunscreen and cover their arms and legs when possible.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic." Dermatology in General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetnz.org/scaly/dsap.html>

<http://www.emedicine.com/cgi-bin/foxweb.exe/searchengine@/em/searchengine?boolean=and&book=all&maxhits=40&HiddenURL=&query=Disseminated%20Superficial%20Actinic%20Porokeratosis>

Hydroa Vacciniforme

A very uncommon disorder, hydroa vacciniforme (HV) is the result of an intensified photosensitivity. The rash produced by HV tends to form raised bumps of skin, or papules, which eventually become blisters. From these lesions comes the first term, 'hydroa,' in the name of the disease. Additionally, these bumps often have indented centers. After a number of weeks the papules will shed away but can leave permanent pocked scars in their place, which are represented by the term 'vacciniforme.' Patients suffering from hydroa vacciniforme might also experience inflamed eyelids, loosened finger and toe nails, a fever, malaise, or headaches. This dermatitis often occurs within 24 hours of exposure to sunlight.

HV affects children at a young age, but tends to subside in intensity upon reaching adolescence. Females are more likely to develop this disease, but men that do develop HV tend to produce rashes until they reach an older age.

Those that have Epstein-Barr viral infection (EBV), a disease which can cause infectious mononucleosis, occasionally develop HV. Patients with EBV tend to have more severe outbreaks in unexposed areas than a person without EBV would develop.

To minimize the severity of HV, it is recommended that patients practice extra careful sun protection behaviors such as applying high SPF sunscreens on exposed areas and avoiding sun exposure whenever possible. It can also help to wear protective clothing, especially those materials that have been scientifically tested to minimize the penetration of UV radiation.

Hydroxychloroquine and beta-carotene can also be helpful in preventing outbreaks.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic." Dermatology in General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetnz.org/reactions/hydroa-vacciniforme.html>

<http://www.emedicine.com/derm/topic181.htm>

Lichen Planus Actinicus

Lichen Planus Actinicus is a rare disorder in which lesions form following exposure to sunlight. These patches can take on a number of different forms, with the most common being an intensely colored ring or tightly grouped pinhead papules (small raised bumps of skin) that are skin colored. Such lesions are found on the face, neck, and back of hands and usually itch.

Most often those that suffer from Lichen Planus Actinicus have dark skin and are from the Middle East, but people of all races and nationalities have developed the disease. The lesions tend to be more common during months when exposure to the sun is greatest.

The causes of this disease are not well understood, but it is hypothesized that the disorder is the result of Hepatitis C or an irregular reaction to a drug. This interaction causes the immune system to attack patches of skin which it believes to be foreign. After 18 months the disorder usually subsides. Once the lesions disappear, dark gray areas of skin often remain for a number of months.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic." Dermatology in General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetnz.org/scaly/lichen-planus.html>

<http://www.emedicine.com/derm/topic233.htm>

Cutaneous Lupus Erythematosus

Lupus erythematosus (LE) is a group of rare skin diseases that are found mostly in females aged 20 - 50. Disorders that fall into this category include discoid LE, subacute LE, neonatal LE, cutaneous lupus mucinosis, chilblain lupus, drug-induced lupus and systemic LE.

Discoid lupus erythematosus is the most common form of LE. Those with this disorder tend to develop red scaly patches on the face, neck and scalp, chest and backs of hands that leave white scars upon fading of the rash itself. Bald spots, warts and patches of thickened skin are all common symptoms of the disorder. It is also important to carefully observe any rashes on the lips that may scar, as this can lead to squamous cell carcinoma.

The discoid form of LE can occasionally (about 10% of the time) transform into the more severe systemic LE, which has the potential to affect nearly any organ in the body. This transformation cannot be prevented or predicted, even if discoid LE is treated. Systemic LE often appears as a red rash that takes a 'butterfly' pattern across the face. In addition, it is common for the skin to become photosensitive and prone to developing oral ulcers and hives. Hair may also thin quickly as a result of LE.

Patients with subacute LE may form dry rashes on the back and chest following exposure to the sun. These lesions take many forms including rings, scaly bumps, purple spots and lumps. Pregnant women with this disease must notify their doctor as it can be passed to their child in the form of neonatal LE. This causes the baby to develop a ring-like rash which fades after a few months, but can lead to congenital heart blockage in the infant if left untreated.

Lupus profundus, also known as lupus panniculitis, destroys the layer of fat beneath the skin, leaving a permanent depression where the fat had been. This most often occurs in the face and can produce inflamed lumps before destroying the fat cells.

Chilblain lupus is very common in people who smoke or live in cool climates. This disorder causes circulatory problems and Raynaud phenomenon, in which fingers lose color when

cold and then slowly turn blue followed by red when heating up. Blood vessels often dilate at the tips of the fingers.

One rare form of LE is cutaneous lupus mucinosis, also known as LE tumidus or papular/nodular mucinosis of Gold. The lesions that develop are most commonly small bumps, large bumps, or scaly patches that can be found on the cheeks, back, upper arms or upper chest. The name of the disorder is derived from the mucin deposits found in biopsied skin.

Most outbreaks of LE are the result of an irritant that can often be avoided, limiting the formation of new lesions. Medications including minocycline, hydralazine, carbamazepine, lithium, sulphonamides and phenytoin can induce LE and should be avoided when possible. Oral and topical steroids, corticosteroids, calcineurin inhibitors, antimalarial tablets, and laser surgery can all help to minimize scarring and reduce the size of lesions. In addition, proper sun protection is extremely important for those with lupus. Defensive behaviors against UV include avoiding direct sunlight when possible, wearing protective clothing, and applying a high SPF sunscreen.

http://www.lupus.org/webmodules/webarticlesnet/templates/new_aboutintroduction.aspx?articleid=71&zoneid=9

<http://www.emedicine.com/ped/topic602.htm>

<http://www.dermnetnz.org/immune/cutaneous-lupus.html>

Pellagra

Pellagra is a disease caused by a deficiency of niacin, also known as nicotinic acid, or the amino acid tryptophan, its precursor. This disease commonly causes diarrhea, dementia, and dermatitis, and can eventually cause death if left untreated.

This disease is most common in people who consume excessive amounts of maize, which lacks tryptophan. Thus, pellagra has been endemic in South America and Mexico, where corn is a staple food. An excessive consumption of millet also causes the disease as it contains abundant leucine, which interferes with tryptophan metabolism, as is seen in a number of areas of India. Alcoholism, diarrhea, gastrointestinal disease, certain drugs, and Hartnup Disease can also cause pellagra.

Pellagra can be detected by observation of progressively deteriorating skin as the disorder becomes increasingly severe. The first stage of this disorder is an increased photosensitivity, causing a rash that resembles a sunburn. This rash is usually symmetrical and may form blisters. Next the skin thickens and becomes pigmented and can itch, crack or bleed. Areas affected include the arm, backs of hands, feet, and legs, as well as scrotum and pressure points. The cheeks, nose, forehead and front of the neck also form a 'butterfly pattern' of affected skin (also known as 'Casal's necklace'). The lips and gums are also prone to cracking and becoming sore.

Other problems faced by those with pellagra include a poor appetite (perpetuating the lack of nutrition that caused the disease), nausea and vomiting. Glossitis, or inflammation of the tongue, is also common, causing a beefy red appearance. In addition, weakness of muscle, depression, confusion, irritability, anxiety, and psychosis are all caused by pellagra.

Pellagra can be treated rather quickly. Nicotinamide or Niacin consumption can begin to remedy the sickness after two days of treatment. Increased consumption of protein and vitamin B can also be effective in correction of malnutrition.

Treating skin properly by wearing protective clothing, using sunscreen and avoiding UV radiation is effective in minimizing irritation caused by pellagra. Certain topical creams can also be helpful in reducing damage to skin from this disease.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic." Dermatology in General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetz.org/systemic/pellagra.html>

<http://www.emedicine.com/ped/topic1755.htm>

Pemphigus

Pemphigus erythematosus (PE), also known as Senear-Usher syndrome, is an uncommon autoimmune disease that causes the skin to blister. It is one of six forms of Pemphigus Foliaceus (PF), which causes many types of blisters yet is relatively benign.

Pemphigus erythematosus usually has a slow onset but eventually causes the skin to develop blisters that tend to crust, ooze and form scales. Besides for the formation of blisters, PE can also cause the skin to form a tender and red 'butterfly pattern' across the nose. Additionally, if left untreated this disease can result in infection, scarring, and the loss of temperature control.

Although many factors can cause the blisters to form, the skin is often particularly sensitive to sunlight. Most commonly affected areas are those that have been continuously exposed to sun such as the face, scalp, back and chest. A lack of blisters on mucous membranes such as the eyes and mouth is a useful hint in differentiating PE from other forms of PF.

This disease is caused by an abnormal reaction of particular antibodies, which in the case of PF disorders attach to desmosomes that connect skin (epidermal) cells. When a person has a form of PF, however, these bridges are destroyed and the cells become surrounded by fluid. This fluid results in blisters that are so close to the surface of the skin they break and ooze easily.

Pemphigus erythematosus affects people of all races, both males and females. Often its victims are between 50 and 60, but rarely is it found in children. Internationally, there are 0.5-3.2 people per 100,000 with a form of pemphigus, but a very small percentage of these people have pemphigus erythematosus.

Treatment is not always necessary in patients with Pemphigus erythematosus as the disease often enters into remission over time. Otherwise, systemic steroids can be helpful in fighting the disease. For skin management a combination of topical cream and antibiotics are often very effective. To prevent outbreaks it is important to protect the skin from irritants such as UV Radiation by applying sunscreen to uncovered areas, wearing protective clothing, and avoiding exposure to sunlight.

<http://www.dermnetz.org/immune/pemphigus-foliaceus.html>

<http://www.emedicine.com/derm/topic317.htm>

Polymorphic Light Eruption

The most common disorder found in people with exaggerated photosensitivity is Polymorphic Light Eruption (PLE). This condition usually manifests itself before age 30, with women developing the disorder at an earlier age than men. Women are also two to three times more likely to develop PLE at all. Even though the disease has been found in people of all skin types, those who are fair-skinned are most likely to experience PLE.

Those with PLE often develop lesions that first appear in the spring and harden by the summertime due to an increased tolerance of sunlight. The rash formed is usually symmetrical and can develop after being exposed to the sun for 30 minutes or more.

The skin eruptions produced by PLE can take many forms. The most common outbreak consists of small pink or red dots (2-5mm) found on the arms, legs or chest, while marks that resemble insect bites can also develop. If the rash is protected from a second exposure during the days following its initial appearance, it will often disappear completely within weeks. However, if the affected area is exposed once again to UV radiation, the rash can become even more severe. For some people a new rash can form every time the skin is exposed to sunlight, even during the winter.

Prevention of PLE outbreaks is not well known, but by using correct behaviors for sun protection one can minimize the extent to which the rash spreads. This includes avoiding sunlight as often as possible and using high SPF (15+) sunscreen to cover any exposed areas or patches of skin that have been affected by PLE. In addition, wearing clothes that have been tested to prevent UV penetration can be very effective in protecting oneself from the dangers of sunlight.

Treatment for Polymorphic Light Eruption includes a number of oral medications such as steroids, polypodium leucotomas, beta carotene, and hydroxychloroquine. Ultraviolet treatment can also be effective if conducted on an annual basis, before UV radiation peaks in the

summertime. In this technique the skin is exposed to increasing amounts of UVA radiation by a dermatologist in a controlled setting.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic." Dermatology in General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetz.org/reactions/pmle.html>

<http://www.emedicine.com/derm/topic342.htm>

Pseudoporphyria

Pseudoporphyria is a disorder that causes skin rashes characterized by blistering, scarring, and fragility. These aggravators include excessive UVA radiation, particular medications, and utilization of haemodialysis in certain patients. Lesions can take months before subsiding and will sometimes result in permanent scars where the rash previously appeared. Pseudoporphyria has an appearance which is very similar to porphyria cutanea tarda (PCT), but differs in the underlying biochemistry that causes the disease.

Men and women are equally likely to develop pseudoporphyria, just as the disease has been found in people of all races and ages. In younger children, however, the illness is more likely to mimic erythropoietic porphyria (EPP) rather than PCT. This form of pseudoporphyria is the result of naproxen use in treatment of juvenile rheumatoid arthritis.

The best treatment for pseudoporphyria is the removal of any irritant which may cause outbreaks to occur. This includes using alternative medications if possible when a diagnosed drug causes a patient to develop lesions. In addition, sunlight and UV radiation should be actively avoided. This should also be supplemented by wearing protective clothing with long sleeves and a hat, as well as with application of a high SPF sunscreen on all exposed areas.

<http://www.blackwell-synergy.com/action/showPdf?submitPDF=Full+Text+PDF+%28220+KB%29&doi=10.1111%2Fj.1600-0781.2007.00263.x&cookieSet=1>

Psoriasis

Psoriasis is a commonly inherited genetic disorder. It is chronic and causes the skin to form inflamed and edematous (or fluid filled) symmetric patches with scales that are silvery-white. Psoriasis also causes a painful or itchy rash on areas such as the scalp, trunk, and limbs, and can also damage nails and joints. This rash tends to become more intense as time progresses without treatment for the disease, resulting in deterioration of pre-existing rashes and reddening of skin in small patches. Those with psoriasis commonly have viral infections or throat infections which cause outbreaks of red dots on the trunk, arms and legs.

Psoriasis is very widespread in the United States, where 2.0% - 2.6% of people suffer from the disorder. However, it is most common in Caucasians and females that are living in cooler regions. While 10-15% of cases are found in people aged 10 years or younger, the average age at which the disease sets in is 28.

Psoriasis rashes can be instigated by various forms of stress. Wounds are often the location of psoriasis outbreaks that surround the injury until it heals. Hormones are also connected to the disease as lesions are common following puberty and during pregnancy. Certain medications, alcohol, and smoking are also likely to cause flares of psoriasis.

While sunlight can help a large percent of those with psoriasis, a small portion of those with the disorder will have a negative reaction towards UV radiation. Such people are photosensitive and can be irritated by sunlight, especially in those areas most exposed to the sun such as the hands, neck, and face. It is crucial for these people to avoid sunlight in order to prevent outbreaks. High SPF sunscreen and protective clothing are also very helpful in protecting against aggravation by UV Radiation.

Psoriasis has no known treatment but does occasionally to fade on its own. Often rashes will enter remission for a number of years and then relapse at a later time. Skin management for psoriasis can often be achieved with the help of topical steroids, coal tar, dithranol, and calcipotriol. Phototherapy as well as self-injected biologics such as Enbrel, Amevive, and

Humira can all be effective tools in minimizing the extent of an outbreak, but they do not eliminate the disease completely.

<http://www.emedicine.com/emerg/topic489.htm>

Rosacea

Rosacea is a common disorder found in an estimated 14 million Americans. This disorder causes redness of the skin on the nose, cheeks, forehead and chin. In more severe cases the neck, ears, chest, and scalp may also be affected. As severity and lack of treatment progress, the disease can cause skin to form red bumps, or papules, and pus-filled pimples. The level of intensity of the disease differs between patients, with some cases being constant while others are recurrent or fading.

Those with rosacea commonly overlook it during its early stages as it can be confused as being acne or a simple tendency to blush often. Additionally, common features of rosacea include persistent flushing and the appearance of capillaries near the skin's surface. Less common features of affected skin include dryness or roughness, increased sensitivity (especially to sun and spicy foods), and inflammation of the face. In severe cases the nose becomes swollen as the tissue it is comprised of expands, a condition known as rhinophyma.

Rosacea tends to afflict women more than men, although men that do have the disorder often have more severe cases. People who are between 30 and 60 or those with lighter skin are most likely to have rosacea.

The severity of rosacea can vary, resulting in a broad spectrum of potential treatments for each case. Medication and surgery offer possible ways to correct facial disfigurements due to rosacea. Useful medications include tetracycline, cotrimoxazole or metronidazole, which minimize swelling of facial skin. In addition, topical treatments that reduce inflammation or flushing can be helpful. Surgery is most effective in correcting disfiguration caused by rhinophyma. Laser surgery can be used to treat telangiectasias, which are the appearance of small red capillaries on the surface of the skin.

It is also very important for patients to minimize UV irritation of the skin by avoiding direct sunlight, hot showers, spicy foods, oily facial products and alcohol. Use of sunscreen and wearing protective clothing can also minimize the affects of the sun on exposed areas.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic."
Dermatology in
General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetz.org/acne/rosacea.html>

<http://www.emedicine.com/derm/topic377.htm>

Rothmund-Thomson Syndrome

Rothmund-Thomson syndrome (RTS), also known as poikiloderma congenitale, is a rare genetic disease that follows an autosomal recessive pattern of inheritance. It is characterized by commonly appearing red rashes, a predisposition to skin cancer and formation of cataracts at a young age. Those that suffer from this disease often have skeletal dysplasias, or abnormal growth of cartilage and bones, resulting in what is commonly identified as dwarfism. In addition, osteosarcoma, the most common malignant bone cancer, also occurs in patients with this disorder. Photosensitivity is found in approximately 30% of patients.

The above-mentioned rash is the symptom found most often in those with the disease. Infants between three and six months old develop red patches and fluid filled (edematous) areas of skin that are covered in scales. This rash first forms on the cheeks, spreads to other parts of the face and then extends to the body's limbs. In addition, the affected skin tends to develop blisters. After a number of years the rash transforms into poikiloderma, which is characterized by atrophy, telangiectasias (spider veins), and changes in the skin's coloring. Additionally, the red patches often become red-brown lesions that are common on the face, extensor extremities and buttocks. To a lesser degree they also appear on the chest, abdomen and back.

Other symptoms of this syndrome include pointed lesions found on the elbows, knees, hands, and feet at puberty, underdeveloped nails, thinning hair and dental abnormalities. Disproportionate hands and feet, skeletal abnormalities infertility and underdeveloped genitalia and secondary sexual traits are all common features.

Rothmund Thomson syndrome's genetic origins make it impossible to treat the disease, but protection of the skin is crucial to managing the disease. This can be done by avoiding sunlight, wearing protective clothing, and through application of high SPF sunscreen. Because those with RTS are more likely to form cancerous tumors, it is important that the skin is checked regularly for any growths. Regular appointments should also be made with an orthopedist,

endocrinologist, and a hematologist/oncologist in order to monitor any changes that may take place within the body.

<http://www.emedicine.com/derm/topic379.htm>

Solar Urticaria

Solar urticaria is a rare disorder that produces a rapid and abnormal response to UV radiation. Upon being exposed to sunlight the skin wheals as it becomes red, swollen, and will often itch or burn. After exposure to the sun for only five to ten minutes a rash can appear, but will normally subside within a few hours, provided that further exposure to sunlight is avoided. All areas of the skin are susceptible, yet the most commonly affected parts are those that are normally covered by clothing but have been exposed to light. In particular, skin that has been bruised is most vulnerable.

Besides for swollen skin and erythema (skin that is red and inflamed), patients suffering from solar urticaria sometimes experience headaches, nausea, difficulty breathing, faintness and syncope. These additional reactions are due to a loss of fluid from the cells that have caused swelling. This is most common when the area of the skin infected by a rash is widespread.

The disorder is more common in females than males and often appears for the first time when the patient is between 20 and 40 years old, although cases have been reported at much younger ages. The disorder has been observed in some patients to remain for many years after its onset, but in others it enters into remission or decreases in severity as the patient ages.

A treatment of the disorder has not been found, so utilizing proper sun protection habits and avoiding direct sunlight can be crucial in preventing outbreaks. In addition, oral antihistamines are useful in minimizing the swelling and itching of affected areas, but do not completely eliminate outbreaks. For severe cases desensitization by phototherapy conducted by a dermatologist can be effective. In this technique the skin is exposed to increasing amounts of UVA radiation in a controlled setting, a solution that can be helpful but is short-lasting.

Hawk, John L., and Paul G. Norris. "Abnormal Responses to Ultraviolet Radiation: Idiopathic." Dermatology in General Medicine. Fourth ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.emedicine.com/derm/topic448.htm>

<http://www.dermnetz.org/reactions/solar-urticaria.html>

Xeroderma Pigmentosum (XP)

Xeroderma pigmentosum (XP) is a very rare disease with an autosomal recessive inheritance pattern. It can be fatal as it causes a high sensitivity to ultraviolet radiation (photosensitivity), causing those with the disorder to develop potentially malignant tumors much more often than the normal population does. The skin also ages rapidly as a result of this disorder and can become discolored.

The damage of DNA by UV Radiation is a common phenomenon that occurs on a regular basis. In healthy individuals, however, the DNA also has certain factors and proteins that quickly repair this DNA before it can replicate and create faulty proteins that are needed in the body, become cancerous or enter into apoptosis (cell suicide). People with XP, however, have a malfunction of these genes and therefore cannot repair damaged DNA. The disease can differ in its level of severity, based upon the particular gene that is causing the disease, as seven forms (given the names XPA, through XPG) of the disease exist.

Xeroderma pigmentosum progresses through three stages in which the patient's health progressively deteriorates. A person with XP is born with skin that appears healthy and without any symptoms of the disease. At 6 months old, however, erythema (a red inflammation of the skin), scaling, and freckles are all observed on skin that has been exposed to UV radiation. Often this includes the neck and lower legs, but can also extend to the trunk. During these early years the characteristics tend to fade during the winter but become permanent as a patient grows older.

With stage two comes the development of poikiloderma in which the skin atrophies, becomes overly or insufficiently colored, and telangiectasia (a dilation of capillaries causing red blotches on the skin) can be seen. This commonly occurs on exposed skin but can spread to non-exposed areas as well.

At stage three, which can set in at an age as young as 4-5 years old, cancers such as squamous cell carcinomas, malignant melanoma, basal cell carcinoma, and fibrosarcoma begin to form mostly on exposed skin.

XP is also characterized by poor vision, or more specifically a sensitivity to sunlight or conjunctivitis. In addition, malignant growths on the eyes, neurological disorders including spasticity and mental retardation, and short stature are all common traits of people with the disorder.

Internationally approximately 1 person per 250,000 has XP, most commonly in the specific forms of XPC and XPD, but XPA is very rarely acquired. In Japan, however, approximately 40% of those with the disease have it in the form of XPA. In terms of sex, men are equally as likely as women to get the disease, just as people of all races are equally likely to acquire the disease. Most often XP is diagnosed in infants aged one to two years old after they are observed to burn very rapidly upon their first exposure to sunlight.

As mentioned, this genetic disease follows an autosomal recessive pattern, which means that two copies of the gene are required in order for someone to have XP. Thus both parents must have a copy (making them carriers) of the disease in order for it to be passed to their children, who have a 1 in 4 probability of acquiring the disease. Because the parents are only carriers, they will not show any symptoms of XP and a family history of the disease is often difficult to identify.

Those with xeroderma pigmentosum under 20 years old are at a risk level 1,000 times that of the normal population of developing either nonmelanoma skin cancer or melanoma. Metastatic malignant melanoma and squamous cell carcinoma also form as a result of XP. Skin cancer appears at an average age of 8 years old in XP patients, as opposed to 60 in those without the disease.

No treatment has been identified for those diagnosed with this disorder. The most important preventive measure to take is minimization of developing skin cancer. This can be done by avoiding as much sunlight as possible and covering any exposed areas with a high SPF sunscreen. In addition, protective clothing including long sleeves, pants, wide brimmed hats and sunglasses should be worn.

Aside from direct protection from UV radiation, a patient with XP must have their skin checked every three to six months for growths and any suspicious area must be tested for cancer. If a tumor is found, surgery should be utilized to remove these dangerous growths. Tests for vision impairment and neurological disorders should also be conducted often to manage any degradation to these systems. Cryotherapy and 5-fluorouracil cream should be used to treat solar keratoses. Isotretinoin, a vitamin A derivative, can also be helpful in preventing the growth of new tumors.

If such precautions are taken under a doctor's supervision then a patient with xeroderma pigmentosum has the potential to live until middle age. However, if the disease is undetected death can occur at a young age due to the unimpeded growth of cancer.

<http://www.dermnetnz.org/systemic/xeroderma-pigmentosum.html>

<http://www.emedicine.com/neuro/topic399.htm>

Medications Included in this Overview:

1. Oral Medications
 - a. Antiarrhythmic
 - i. Amiodarone
 - ii. Quinidine
 - b. Antibiotic
 - i. Ciprofloxacin
 - ii. Co-Trimoxazole (Trimethoprim-Sulfamethoxazole)
 - iii. Dapsone
 - iv. Tetracycline
 - c. Antifungal
 - i. Griseofulvin (Griseovin)
 - d. DMARD
 - i. Hydroxychloroquine
 - e. Diuretic
 - i. Furosemide
 - ii. Hydrochlorothiazide
 - f. Herbal Antidepressant
 - i. St. John's Wort
 - g. NSAID
 - i. Ibuprofen
 - ii. Ketoprofen
 - iii. Naproxen
 - h. Phenothiazine
 - i. Chlorpromazine
 - i. Retinoid
 - i. Acitretin
 - ii. Isotretinoin
2. Topical
 - a. Antineoplastics
 - i. 5 – Fluorouracil
 - b. Furocoumarins
 - i. Psoralen
 - c. Keratoplastics
 - i. Coal Tar
 - d. PDT Pro-photosensitiser
 - i. 5 – Aminolevulinic Acid
 - e. Retinoid
 - i. Tazarotene
 - ii. Tretinoin
 - f. Other Photosensitizing Agents
 - i. Sunscreen
 - ii. Fragrances

iii.

Generic Name	Brand Names	Type of Drug
Amiodarone	Cordarone	Oral Antiarrhythmic
Quinidine	Quinidex	Oral Antiarrhythmic
Ciprofloxacin	Cipro XR and Proquin XR	Oral Antibiotic
Co-Trimoxazole	Bactrim, Septra, and Sulfatrim	Oral Antibiotic, 'Sulfa' Drug
Dapsone	Aczone	Oral Antibiotic, 'Sulfone' Drug
Tetracycline	Sumycin	Oral Antibiotic
Griseofulvin	Fulvicin, Grifulvin, and Gris-PEG	Oral Antifungal
Hydroxychloroquine	Plaquenil	Oral DMARD
Furosemide	Delone, Detue, Lasix	Oral Diuretic
Hydrochlorothiazide	Microzide	Oral Diuretic
St. John's Wort		Oral Herbal Antidepressant
Ibuprofen	Tylenol, Motrin, and Nuprin	Oral NSAID
Ketoprofen	Orudis	Oral NSAID
Naproxen	Aleve, Anaprox, Naprosyn	Oral NSAID
Chlorpromazine	Chlorpromazine Hydrochloride Intensol and Thorazine	Oral Phenothiazine
Acitretin	Soriatane	Oral Retinoid
Isotretinoin	Accutane, Amnesteem, Claravis, Sotret	Oral Retinoid
5 – Fluorouracil	Carac, Efudex, Fluoroplex	Topical Antineoplastics
Psoralen		Topical Furocoumarins
Coal Tar	Denorex, Pentrax, Tegrin	Topical Keratoplastics
5 – Aminolevulinic Acid	Levulan	Topical PDT Pro-photosensitiser
Tazarotene	Tazorac Avage, Zorac	Topical Retinoid
Tretinoin	Retin-A, Renova	Topical Retinoid
Sunscreen	N/A	Other
Fragrances	N/A	Other

Amiodarone

Amiodarone is an oral medication that belongs to a category of drugs known as antiarrhythmics, which are used to correct a heart that beats at an irregular rhythm. Occasionally the medication can make the heartbeat even more erratic or can cause a normally beating heart to lose its rhythm, making it important that those taking it follow their doctor's orders very closely. Often those starting a treatment of amiodarone will be monitored for the first few days until their doctor finds that their body has responded to the drug in the desired way. It is also important to note that the medication only controls the heartbeat while the patient is taking the drug, but it does not permanently correct arrhythmia. Patients taking this medication will rarely develop lung or liver disease, so it is very important that you tell your doctor of any past problems with these organs and that they are carefully monitored when you are taking amiodarone. This medication is sold under the brand name Cordarone.

A number of precautions must be followed while taking amiodarone. Grapefruit can cause the body to have an undesirable reaction and should not be eaten while the drug is being taken. Certain medications can also interact badly with amiodarone, so it is incredibly important to make sure that those taking the drug inform their doctor of any other treatments that are being taken.

In addition, sunlight can cause skin to become a permanent blue-gray color and exposure should therefore be avoided when possible. When the skin is to be exposed to UV radiation it is crucial to protect it by wearing protective clothing such as a wide-brimmed hat, long sleeves and pants. Another important defensive step to take is applying a broad spectrum high SPF (30+) sunscreen to any exposed areas.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a687009.html>

Quinidine

Quinidine is a medication that is classified as an ‘antiarrhythmic,’ meaning that it is used to steady an irregular heartbeat. If the drug is properly taken it is usually highly effective, but in rare cases it can cause serious damage to the heart as it causes normal heartbeats to become severely abnormal. When the drug functions properly it allows its user to perform normal tasks much more easily and with less stress. Blood thinners are sometimes used prior to a quinidine dosage is started so that blood clots can be eliminated before the heartbeat is corrected. The medicine is sold under the brand names Quinaglute or Quinidex.

Quinidine functions by minimizing the speed of the heart muscle’s electrical conduction, elongating the amount of time required for the electrical phase to be created when the heart muscles are electrically stimulated, and by extending the amount of time required for the recovery period of the heart muscle cells.

Occasionally patients will experience a photosensitive reaction in which exposed skin undergoes an abnormal response to the ultraviolet rays of the sun. This can be avoided by minimizing the amount of time spent in direct sunlight when possible. In addition, application of a broad spectrum, high SPF (30+) sunscreen and wearing protective clothing can reduce the effects of UV light.

<http://www.webmd.com/drugs/drug-12175-Quinidine+Gluconate+Oral.aspx?drugid=12175&drugname=Quinidine+Gluconate+Oral>

Ciprofloxacin

Ciprofloxacin is a quinolone, which is a type of antibiotic (drugs that are used to kill bacteria). In particular, this medication most commonly destroys those bacteria that cause urinary tract infections. The medicine is sold under the brand names Cipro XR and Proquin XR. Patients usually see improvements within 2-3 days of treatment, even if the bacteria was previously resistant to the commonly used amoxicillin. In addition to basic kidney infections, other ailments associated with the invasion of the kidney itself can also be treated with ciprofloxacin including high temperature, nausea and chills. Ciprofloxacin is also a crucial medication in treating those that have been exposed to the anthrax-causing bacteria.

It is important to note that quinolones can impede the growth of certain parts of the body including teeth, bones and cartilage. Therefore it is crucial that this medication is not used in those that are younger than 18 years old.

For those that are receiving this drug in an attempt to eliminate a urinary tract infection, treatment usually lasts 3 days but can take up to 10-14 days in more severe bladder or kidney infections. Even if symptoms have subsided it is very important that all prescribed antibiotics are taken. This increases the chance of eliminating all bacteria, which in turn reduces the likelihood of a second infection by drug-resistant bacteria.

Those taking ciprofloxacin occasionally develop photosensitive skin, in which abnormal reactions to sunlight commonly occur. In order to avoid this it is important that patients avoid direct sunlight whenever possible. Additionally, applying a broad spectrum, high SPF (30+) sunscreen and wearing protective clothing such as pants, long sleeves and a wide-brimmed hat are all helpful behaviors in minimizing outbreaks.

Patients that are taking ciprofloxacin at the same time as other medications must notify their doctor prior to beginning their treatment, as ciprofloxacin reacts with a large number of over the counter and prescribed drugs.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a688016.html>

<http://www.webmd.com/a-to-z-guides/Fluoroquinolones-for-urinary-tract-infections-UTIs>

Co-Trimoxazole (Trimethoprim-Sulfamethoxazole)

This medication is used to fight bacterial infection and is actually a combination of two drugs, trimethoprim and sulfamethoxazole (a member of the 'sulfa drugs' group), that can be taken orally or by injection. It is sold under the brand names Bactrim, Septra, and Sulfatrim. Co-trimoxazole is most effect in killing the bacteria involved in urinary tract, ear, and respiratory tract infections. In addition, this drug is also helpful in treating traveler's diarrhea, or *Pneumocystis carinii*, often found in patients with AIDS or cancer.

Those taking co-trimoxazole commonly see an improvement in their infection within 2-3 days of treatment. Dizziness and potential kidney problems are occasionally observed in patients, so drinking a large amount of water to keep hydrated is very important. Because co-trimoxazole can cause an upset stomach it is important to take the medicine during meals. For those taking methotrexate, phenytoin (Dilantin), warfarin (Coumadin), or vitamins, it is crucial that the doctor prescribing prior co-trimoxazole is informed prior to beginning treatment in order to avoid an adverse reaction to the medicine.

Co-trimoxazole is known to cause an increased sensitivity to the sun, a disorder known as photosensitivity. For this reason it is important that those taking the medication defend themselves from the sun by wearing protective clothing including long sleeves, pants and a hat, and that they also apply a high SPF sunscreen. Avoiding direct sunlight greatly minimizes outbreaks due to exposure to UV radiation.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a684026.html>

<http://www.drugdigest.org/DD/DVH/Uses/0,3915,169%7CCotrim+oral,00.html>

Dapsone

Dapsone is an antibiotic medication that is prescribed for treating a number of skin disorders including leprosy, dermatitis herpetiformis, Hansen's Disease, and skin infections. This is achieved by reducing inflammation and destroying the bacteria that causes these infections. Dapsone is also utilized to prevent a number of infections that are associated with HIV including pneumocystis pneumonia and toxoplasmosis. The medication, however, is ineffective against viral infections. Dapsone is a sulfone drug and is sold under the brand name Aczone.

Those taking Dapsone occasionally experience a number of side effects from the drug including vomiting, nausea and anemia. In addition, women that are breastfeeding while taking the medication may pass it on to their children through breast milk, causing a number of illnesses in an infant. Therefore it is highly advisable to avoid breast feeding or to discuss discontinuing the medication with a doctor to ensure the healthy development of the baby.

Rashes and other abnormal skin reactions caused by an allergy to this drug occur in certain patients but are usually mild in severity. Occasionally these rashes will become very severe in which case medical attention is needed. Additionally, the sun can sometimes irritate the skin and worsen the conditions of the rash, making it important to avoid exposure when possible. Wearing protective clothing such as long sleeves, pants, and a wide-brimmed hat, as well as applying a broad spectrum, high SPF (30+) sunscreen are helpful activities in defending oneself from the dangers of UV radiation.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682128.html>

<http://www.webmd.com/drugs/drug-6744->

[Dapsone+Oral.aspx?drugid=6744&drugname=Dapsone+Oral](http://www.webmd.com/drugs/drug-6744-Dapsone+Oral.aspx?drugid=6744&drugname=Dapsone+Oral)

Tetracycline

Tetracycline is an oral antibiotic, meaning it is used to fight bacterial infection, and is sold under the brand name Sumycin. In particular, the medicine has been prescribed for treating skin disorders including rosacea and acne vulgaris as well as infections of the urethra and pelvis for more than fifty years. The medication functions by binding to aminoacyl-tRNA enzymes that are a key part of DNA translation in bacteria. By stopping this molecule from binding to the ribosomes in bacterial cells the tetracycline impedes the bacteria's ability to create vital proteins.

Decades ago tetracycline research proved that this medication can result in the formation of a phototoxic reaction, although only to a small degree. Although the mechanism that causes the medication to become phototoxic is unclear, it appears to be oxygen-dependent and can result in altered cell membranes and DNA. Of the many derivatives of tetracycline, the most common form that causes increased photosensitivity is doxycycline, and the least likely to cause the reaction is minocycline. With all tetracycline medications, however, a higher dosage often results in a greater sensitivity to UV radiation.

It is of crucial importance that patients who are on tetracycline make an active attempt to defend their skin from the dangers of the sun's rays. The most effective behaviors for doing this include avoiding direct exposure to sunlight (glass does not block UVA rays from penetration), application of a broad spectrum, high SPF (30+) sunscreen, and wearing protective clothing including a wide-brimmed hat, pants, and long sleeves.

Harber, Leonard C. "Abnormal Responses to Ultraviolet Radiation: Drug-Induced Photosensitivity." Dermatology in General Medicine. 4th ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.dermnetz.org/treatments/tetracycline.html>

Griseofulvin (Griseovin)

Griseofulvin is an oral medication used to treat ringworm, jock itch, athlete's foot, nail disease and various fungal infections. It is sold under the brand names Fulvicin, Grifulvin, and Gris-PEG. This medicine is a derivative of the fungus *Penicillium griseofulvum*. By interfering during a process known as mitosis, this drug has the ability to impede fungal reproduction, ultimately causing the fungus to die without creating offspring that can continue to harm the patient.

Symptoms of these illnesses often begin to improve within a few days of starting the medication, although the duration of treatment can last much longer. Thus, those taking griseofulvin must often remain on the medication for a number of weeks or months with the duration of the treatment depending on the area affected. For example, the medication is required for 2 to 4 weeks for those with a skin infection, 4 to 6 weeks for hair or scalp infections, 8 weeks for foot infections, and 3 to 4 months for fingernail infections.

Side effects from this medication are rare, although nausea, headaches, fatigue and dizziness do occur in some patients. It is important to note that griseofulvin can also cause photosensitivity, meaning that the skin reacts abnormally to sunlight, often developing a rash. In order to prevent this from occurring it is crucial that patients apply a broad spectrum, high SPF (30+) sunscreen, wear protective clothing including sunglasses, a wide-brimmed hat, long sleeves and pants, and avoid direct sunlight when possible.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682295.html>

Hydroxychloroquine

Hydroxychloroquine is a member of a group known as ‘antimalarial drugs’, which are used to treat and/or prevent malaria. It also falls under the category of DMARDs, or Disease-Modifying Antirheumatic Drugs. This medication, sold under the brand name Plaquenil, does not, however effectively eliminate malaria strains that are chloroquine resistant. In addition, hydroxychloroquine is helpful in treating unresponsive cases of discoid or systemic lupus erythematosus and rheumatoid arthritis, especially when the drug is combined with other medications. When it is used to cure these diseases, the drug minimizes rashes and outbreaks in lupus and reduces swelling in those with arthritis.

In malaria-prevention treatments, hydroxychloroquine is most often taken one time per week and is started two weeks prior to arrival in the malaria-infected region, where the same dosage is required. After leaving the area the medication continues to be taken once per week for 4 to 8 weeks. It is crucial to continue the treatment even after leaving the infected region, as stopping the medicine early can result in development of the disease.

Hydroxychloroquine can sometimes cause headaches, stomach aches, dizziness or vomiting. To minimize nausea and other stomach related illnesses it can help to take the medicine with a glass of milk or food. In addition, this drug can cause a rash on skin that has become photosensitive, meaning that it reacts abnormally to ultraviolet light from the skin. Behaviors that decrease the likelihood of such an outbreak include avoiding exposure to sunlight when possible, wearing protective clothing such as long sleeves, pants and a wide-brimmed hat, and applying a broad spectrum, high SPF (30+) sunscreen.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a601240.html>

<http://www.webmd.com/drugs/drug-5482->

<Hydroxychloroquine+Oral.aspx?drugid=5482&drugname>

[=Hydroxychloroquine+Oral](#)

Furosemide

Furosemide is used to lower blood pressure by acting as a diuretic, which in turn limits the likelihood of experiencing a stroke, heart attack or kidney failure. By increasing urine output and lowering the amount of water found in the body, a patient's blood pressure is also lowered. Edema is another serious medical condition in which a portion of the body becomes swollen, at which point furosemide can be prescribed so that the excess water in the body can be reduced. It is very important that the drug is used only as prescribed since an overdose of the medication can result in severe water and mineral loss, which can eventually cause dehydration. In addition, furosemide can cause calcium and phosphorous levels in the blood to decrease, in which case medical attention will be necessary. Furosemide is sold under the brand names Delone, Detue, and Lasix.

This drug has a few common side effects that one must be cautious of when taking the medicine that include dizziness, drowsiness and blurred vision. Because of these symptoms it is important to be very careful when treatment begins in order to avoid accidents. In addition, sensitivity to sunlight is heightened by this medication, making it very important for patients to apply a broad spectrum, high SPF (30+) sunscreen and wear protective clothing when they cannot avoid being exposed to sunlight.

http://www.webmd.com/drugs/mono-8043-FUROSEMIDE+-+ORAL.aspx?drugid=5512&drug_name=Furosemide+Oral

Hydrochlorothiazide

Hydrochlorothiazide is a diuretic medication that is most often used to reduce high blood pressure. This is done by reducing the amount of salt and water in the blood stream, causing an excess of urine to be produced. In addition, this medicine can be used to reduce edema of various parts of the body, an ailment in which different tissues become swollen with water. For cases in which the lungs are filled with fluid this drug makes it much easier for the patient to breath, whereas a reduction in the size of swollen legs can make it easier for a patient to walk. Another very important usage of this medication is the prevention and treatment of kidney stones, which are small buildups of calcium that cause a blockage in the kidney. This medicine is sold under the brand name Microzide.

Because this medication functions by increasing the amount of urine produced by the body, it is important that those taking hydrochlorothiazide make certain that they are well hydrated. Signs of dehydration include weakness, muscle cramps, dizziness, fainting, or a dry mouth. Besides for dehydration, some patients that take hydrochlorothiazide become nauseous, experience a loss of appetite, have headaches, and occasionally lose sexual ability.

Those taking hydrochlorothiazide must avoid taking cholestyramine or colestipol at the same time, as these medications can cause the amount of hydrochlorothiazide absorbed by the body to decrease. Patients using these medications at the same time should wait a minimum of four hours between taking each one.

Hydrochlorothiazide may also cause the skin to become photosensitive, meaning that any exposure of the skin to sunlight can result in an abnormal outbreak or rash. To

defend against this, those taking this medication should minimize the amount of time spent under direct exposure to light. Moreover, a broad spectrum, high SPF (30+) sunscreen should be applied to any exposed skin and protective clothing should be worn whenever possible.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682571.html>

St. John's Wort

St. John's Wort is an orally taken herbal medication that comes from a plant with yellow flowers. It is often used to alleviate mental illnesses, depression, anxiety and sleep disorders, and was at one time used as a treatment for wounds and malaria. While many people take St. John's Wort as a treatment for depression, certain studies have demonstrated that it is not effective in reducing depression any more than a placebo would be. As other studies have made the opposite conclusion, a definitive answer regarding the true impact of this herbal medicine has not yet been reached.

It is very important that anyone taking St. John's Wort inform their health care provider that they have begun using this medication. This is because the drug has not been approved by the FDA for use in treating depression or other disorders. Sometimes St. John's Wort will be ineffective in curing depression, causing the disorder to become much more severe the longer it remains untreated. In addition, the herb can react with other medications or substances in the body, in particular antidepressants, causing an undesirable response. Speaking with a doctor about such unintended interactions is also very important for patients receiving this medicine.

Those that are taking St. John's Wort often suffer from an increased sensitivity to the sun, also known as a photosensitivity response, which can cause the skin to develop abnormal rashes. In order to avoid this, it is important that patients avoid direct sun exposure when possible. Also, covering the skin with long sleeves, pants, and a wide-brimmed hat, as well as applying a broad spectrum, high SPF (30+) sunscreen can be helpful in minimizing outbreaks due to the sun's rays.

<http://nccam.nih.gov/health/stjohnswort/>

<http://www.webmd.com/depression/tc/St-Johns-Wort-Topic-Overview>

Ibuprofen

This commonly used medication belongs to a group of drugs called nonsteroidal anti-inflammatory drugs, or NSAIDs, which reduce pain, aching, swelling and tenderness. It can be prescribed to those with menstrual cramps or rheumatoid arthritis or osteoarthritis. In addition, it is also used as an over the counter, non-prescribed drug for treating an assortment of mild pains such as backaches, headaches, toothaches, muscle aches and the common cold. This medication is sold under the brand names Advil, Motrin, and Nuprin.

Ibuprofen functions by minimizing the production rate of the enzyme that produces prostaglandins, which are molecules that cause people to feel pain. By eliminating these enzymes a person in pain no longer feels uncomfortable. In order to maximize the effectiveness of the drug it is important to use the ibuprofen as soon as pain is experienced, as the potency of the medicine decreases as pain becomes increasingly intense.

Ibuprofen occasionally causes side effects involving the stomach including nausea or intestinal bleeding, although these are relatively rare occurrences. Over-the-counter ibuprofen should not be taken for a period greater than 10 consecutive days without seeing a doctor.

Another problem, although it is relatively uncommon for those taking ibuprofen, is developing a skin rash due to photosensitivity. To minimize the likelihood and the extent of an outbreak, it is important to avoid sunlight when possible. If exposure to UV radiation is not possible, application of a high SPF sunscreen and wearing protective

clothing such as a wide-brimmed hat, pants and long sleeves can aid in defending the skin.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682159.html>

http://www.webmd.com/drugs/mono-9368-IBUPROFEN+-+ORAL.aspx?drugid=5166&drug_name=Ibuprofen+Oral

Ketoprofen

Ketoprofen is a medication that is used to minimize pain and swelling caused by arthritis, tooth aches, backaches or menstrual cramps. This drug can also be helpful in reducing fever or other symptoms of the common cold or the flu. Ketoprofen is sold under the brand names Orudis, Actron, and Oruvail, and is a member of the medicine family known as NSAIDs or Nonsteroidal Anti-Inflammatory Drugs.

Those taking ketoprofen occasionally develop photosensitive skin, in which abnormal reactions to sunlight commonly occur. In order to avoid this it is important that patients avoid direct sunlight when possible. Additionally, applying a broad spectrum, high SPF (30+) sunscreen and wearing protective clothing such as pants, long sleeves and a wide-brimmed hat are all helpful behaviors in minimizing outbreaks.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a686014.html>

Naproxen

Naproxen is a medication sold under the brand names Anaprox, Naprelan, Naprosyn, and Aleve, and it can be found in both prescribed and non-prescribed forms. When it is prescribed, the drug relieves discomfort and pain caused by many forms of arthritis including rheumatoid, juvenile, ankylosing spondylitis and osteoarthritis, as well as tendonitis, gout, and other diseases that cause pain. When the non-prescription form of naproxen is used, it can treat fever, common mild pains and aches caused by arthritis and menstruation.

This medication falls under a category of drugs known as NSAIDs, or nonsteroidal anti-inflammatory drugs. The members of this group of substances minimize pain by reducing the amount of prostaglandins produced in the body, which are molecules that trigger a painful sensation in injured parts of the body. With lower levels of prostaglandins in the blood, the body is less likely to become inflamed, produce a fever, or experience pain.

Naproxen can cause a number of side effects when combined with other medications. It can result in an excess of lithium, a substance that is toxic in high amounts, to be excreted by the kidneys. The medication can also lower the blood pressure, an effect that might be contrary to desired conditions within the body.

Studies have not determined whether or not naproxen can damage a developing fetus, but until it has been proven safe it is not recommended that women become pregnant while taking the medication. In particular, NSAIDs are often transmitted through breast milk and can be harmful to a newborn that is breast feeding on this milk.

Therefore it is important that women taking this drug inform their doctors of this decision.

Those taking naproxen sometimes experience photosensitivity, in which the skin develops abnormal rashes upon being exposed to sunlight. In order to defend oneself against this, it is important that those taking the medication minimize direct exposure to sunlight, apply a broad spectrum, high SPF (30+) sunscreen, and cover as much skin as possible with protective clothing.

<http://www.medicinenet.com/naproxen/article.htm>

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a681029.html>

Chlorpromazine

This oral medication has been used most often over past decades for treating mental disorders and is sold under the brand names Chlorpromazine Hydrochloride Intensol and Thorazine. This drug falls under a category of medications known as phenothiazines that all function by stabilizing the chemical components of the brain, often allowing a person's previous mental illnesses to fade. Such disorders include hallucinations, delusions, and hostility. Chlorpromazine is also used to treat children with severe behavior problems or chronic nausea.

While phototoxicity reactions are rather common in patients that are taking the medicine, the chemicals causing this response can be so potent that even pharmacists who handle the drug occasionally experience photosensitivity. This reaction can cause areas of the skin that have been exposed to sunlight to become slate-gray in coloring as a result of the chlorpromazine mixing with melanin. Because of this it is recommended that anyone taking the medication avoids sunlight whenever possible. If exposure to the sun does occur, application of a broad spectrum, high SPF (30+) sunscreen and wearing protective clothing that covers as much skin as possible can be helpful.

The medication often takes 2-3 weeks for improvements to be observed, a characteristic of chlorpromazine that can frustrate patients. If the condition becomes worse or does not improve following this period of time, it is important that patients contact their doctor. In addition, stopping the medication should be done slowly as the body can have uncomfortable reactions (although the medication is not addictive) if it is stopped suddenly.

Harber, Leonard C. "Abnormal Responses to Ultraviolet Radiation: Drug-Induced Photosensitivity." Dermatology in General Medicine. 4th ed. 2 vols. New York: McGraw-Hill, Inc., 1993.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682040.html>

http://www.webmd.com/drugs/mono-3053-CHLORPROMAZINE+-+ORAL.aspx?drugid=1444&drug_name=Chlorpromazine+Oral

Acitretin

Acitretin is most often prescribed as a treatment for psoriasis, a skin disorder characterized by erythema, (red and swollen skin) and plaques (whitish-gray scales). This medication does not permanently stop psoriasis outbreaks from occurring, but can minimize outbreaks while the drug is being taken. Often, however, it takes 2-3 months before this occurs in many patients. Acitretin is also used to treat other diseases including Darier's Disease and other disorders related to the skin. It is classified as a retinoid and is sold under the brand name Soriatane.

Acitretin can cause birth defects and therefore pregnancy is prohibited in women that are taking the medication or those that have not been off of the medication for longer than two months. In addition, fertile women that are taking the medicine are required to also be on a minimum of two contraceptives and must undergo a pregnancy test once a month in order to refill their prescription. It is crucial that women do not drink alcohol while taking this medicine as the two substances can combine to form a chemical that remains in the body for a long time and can harm a developing fetus. A small amount of acitretin is found in semen, but it is unknown if this amount can actually cause harm to a fetus, and therefore it is recommended that men discuss their situation with a doctor prior to conceiving a child.

A number of precautions must be followed while taking this medication. Acitretin can cause blood sugar levels to become abnormal, so it is important that anyone taking the medication discusses this with their doctor. Sunlight can also irritate the skin, making it crucial to protect oneself by wearing protective clothing such as a wide-

brimmed hat, long sleeves and pants. Another important defensive step to take is to apply a high SPF sunscreen to any exposed areas.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a601010.html>

Isotretinoin

Isotretinoin is an oral retinoid most often used to cure severe cystic or nodular acne that has been unresponsive to other treatments. This medication is sold under the brand names Accutane, Amnesteem, Claravis, and Sotret. Isotretinoin causes the amount of oil produced by the face to dramatically decrease, in turn reducing facial acne. The drug has been identified as causing severe birth defects for the babies of those women taking it, and therefore pregnant women cannot be prescribed the medication. In addition, those women that are taking isotretinoin are required to take monthly pregnancy tests, known as the iPLEDGE program. It is recommended that women do not become pregnant less than a year following the end of their treatment with this medication.

Those on isotretinoin often have acne and therefore have sensitive skin prior to starting the medication. Once a patient is taking this drug, however, the skin can become even more photosensitive, meaning that many forms of natural or artificial ultraviolet radiation can irritate the skin. Therefore it is important that those taking isotretinoin avoid exposure to sunlight whenever possible, apply a broad spectrum, high SPF (30+) sunscreen to any exposed skin, and wear protective clothing such as long sleeves, pants and a wide-brimmed hat when they are outdoors.

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a681043.html>

<http://www.webmd.com/drugs/drug-6662-Isotretinoin+Oral.aspx?drugid=6662&drugname=Isotretinoin+Oral>

5-Fluorouracil

Fluorouracil (5-FU) is a form of chemotherapy that falls within the group of drugs known as antineoplastics. The treatment is delivered in the form of an injection, topical cream, or an oral medication (sold by the brand names Adrucil, Carac, Efudex and Fluoroplex). Most commonly this drug is used as a treatment for colon, rectal, stomach, pancreatic and breast cancers, although it has also been proven effective in a large number of cases involving ovarian, cervical and bladder cancer. The medication acts as an antimetabolite, meaning that it disturbs the growth cycle of cells. The molecule appears to be a vital nutrient to the cancerous cells that engulf the drug. Once inside the cell, however, the molecule interferes with the production of RNA. This in turn stops new copies of DNA from being made in the cell, which causes the cell to stop reproducing and to eventually die.

Fluorouracil causes the skin to become red or blister and treated skin will often become very dry and peel away. In addition, the skin can become irritated, sting, or a sunburn can develop quickly. Because of this new photosensitivity, it is very important that those receiving doses of fluorouracil defend their skin from damage due to the sun's rays by avoiding exposure when possible, applying a broad spectrum, high SPF (30+) sunscreen to exposed areas, and wearing protective clothing.

When taken orally or intravenously, fluorouracil has the potential to cause a number of other side effects including hair loss, nausea and vomiting. The medication can also interfere with the menstrual cycle in women or sperm production in men, although this does not occur in everyone. It is important to use birth control while

undergoing chemotherapy, as pregnancy is not advisable for women receiving treatments of fluorouracil.

http://www.medicinenet.com/fluorouracil_topical/article.htm

<http://www.medicinenet.com/fluorouracil-injection/article.htm>

<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682708.html>

Psoralen

The term 'psoralen' describes a group of medications that darken the skin upon reacting with UVR. A procedure known as PUVA combines psoralen and UVA light in an attempt to treat certain diseases of the skin such as psoriasis. UVA does not normally improve the psoriasis without the help of an additional drug. Psoriasis causes cells to reproduce at a very rapid rate, which is slowed by the usage of PUVA therapy.

Psoralen is administered orally approximately 75 to 120 minutes prior to the skin is to be exposed to UVA. The medication can also be topically applied by a 'soak,' in which individual body parts are submerged in psoralen dissolved in water, or in a 'bath,' in which the entire body is submerged. Those that are taking the medicine topically risk higher chances of having a photosensitive response in which the skin breaks out into a rash or is easily burned. Other side effects of the medication include nausea, itching, redness, and the development of cataracts.

Psoralen occasionally causes photosensitivity of the skin, which, in combination with the UVA light used to treat psoriasis, can cause an undesirable reaction of the skin. Most importantly, the psoralen can cause skin cancer to develop, which requires immediate attention and removal by a dermatologist. In order to prevent further irritation by the sun, it is important to reduce the amount of time spent in direct sunlight and to eliminate it if possible. Additionally, the application of a broad spectrum, high SPF (30+) sunscreen and wearing protective clothing can be useful behaviors in defending oneself from the harms of the sun.

<http://www.psoriasis.org/treatment/psoriasis/phototherapy/puva.php>

Coal Tar

Coal tar is the liquid form of coal that has been distilled at extremely high temperatures. The crude tar tends to be black and very thick, although it comes in solutions of varying concentration, from 0.1 % to 20%. It is often combined with other substances and used in the form of shampoo, creams or ointments, and is then applied to treat eczema or psoriasis, especially on the scalp. This medication is useful because it is less toxic than other drugs used to treat the same diseases, and also because it is less expensive to produce.

A number of recommendations have been made for those using coal tar, including applying the medicine at night due to its unpleasant scent and tendency to stain both skin and clothing. It is also advised that those using coal tar leave the solution on for at least two hours and that they avoid application of the tar on blistered or infected areas of skin.

Coal tar also acts as a photosensitizing agent, meaning that it may cause the skin to become sensitive to UV light. In order to minimize irritation of the skin, it is important to avoid the sun when the tar has been applied. In addition, wearing protective clothing and applying a broad spectrum, high SPF (30+) sunscreen can reduce the chances of developing a rash.

<http://dermnetnz.org/treatments/coaltar.html>

5 - Aminolevulinic Acid

Aminolevulinic acid, sold under the brand name Levulan, is a topical medication (meaning that it is directly applied to the skin) that is utilized during a process called photodynamic therapy, or PDT. This procedure is used to eliminate abnormal skin cells that may form actinic keratoses (AK), acne vulgaris or squamous cell carcinomas. Following application of this medication, a lamp that emits a controlled amount of blue light is shined onto the skin that has been treated with the aminolevulinic acid. The energy from the light causes the molecules of the drug to change shape, destroying abnormal cells in the process.

After a PDT session has been completed, the skin will often become sensitive to bright lights, especially halogen and ultraviolet rays. Exposure to this light can very quickly result in irritated skin. Redness and swelling are the most common reactions to sunlight upon undergoing this treatment. In addition, burning, stinging or tingling sensations occasionally occur in those using PDT.

In order to avoid the above-mentioned side effects, it is crucial that patients notify their doctor of any other medications that they might be taking. This is necessary because certain drugs cause the skin to become photosensitive, meaning that these substances will cause skin to form rashes or outbreaks, which can become much more severe upon exposure to sun following a PDT session. In addition, it is important that those undergoing this treatment also protect their skin by covering as much as possible from exposure to light by wearing pants, long sleeves, a wide-brimmed hat and sun glasses. Diligent use of a broad spectrum sunscreen is required for 48 hours following PDT.

http://www.medicinenet.com/aminolevulinic_acid_solution_applicator/page2.htm

<http://www.webmd.com/drugs/drug-20437->

[Aminolevulinic+Acid+HCl+Top.aspx?drugid=20437&drugname](#)

[=Aminolevulinic+Acid+HCl+Top](#)

Tazarotene

Tazarotene is a medication that is used to treat psoriasis or acne and is sold under the brand names Tazorac, Avage, and Zorac. This drug is a retinoid that is found in the form of a topical cream that can be applied to the face or other affected areas, but only a small amount should be placed on these regions.

Occasionally tazarotene will cause the skin to itch, burn, become red, sting or develop scales on the region where the cream has been applied. These areas can be further irritated by electrolysis, waxing or other hair removal products, which should all be avoided when tazarotene is being used.

Fetuses can be harmed by tazarotene and therefore women using the cream should not become pregnant while they are using the medication. In addition, those that are using this drug and are fertile must have a pregnancy test within two weeks of beginning the medicine to prove that they are not endangering a fetus by taking the drug. The impact that tazarotene has on breast milk is not yet known, making it highly advisable for women to speak to their doctor prior to beginning breastfeeding.

Tazarotene may also cause the skin to become photosensitive, meaning that any exposure of the skin to light can result in an abnormal outbreak or rash. To defend against this, those taking this medication should minimize the amount of time spent exposed to direct sunlight. Moreover, a broad spectrum, high SPF (30+) should be applied to any exposed skin and protective clothing should be worn whenever possible.

http://www.webmd.com/drugs/mono-9230-TAZAROTENE+-+TOPICAL.aspx?drugid=561&drug_name=Tazarotene+Top

Tretinoin

Tretinoin is a medication that is most commonly used to manage acne. It causes the skin in affected areas to peel off and can also minimize the number of new pimples that form. This medication has been observed to quickly heal areas of acne and to unclog pores. Tretinoin is also used to improve overall skin quality by eliminating lines and wrinkles on the face and reducing roughness. This medication is a member of the retinoid family and is sold under the brand name Retin-A for acne treatment and Renova for treatment of photoaged skin. It is applied as a topical liquid, cream or gel.

Those using tretinoin sometimes experience irritated and reddened skin within the first week of starting the medication, but this is not abnormal. Effects of using this medication are usually not observed for 2-3 weeks following the first application. Tretinoin should be applied on a daily basis unless notified otherwise, and should be continued even if slight aggravation of the skin does occur. If this irritation worsens or does not appear to subside, a doctor should be informed before discontinuing the medicine.

Irritated skin can often become more intensely exacerbated if it is exposed to the ultraviolet rays of the sun. Such a photosensitivity response can be minimized by avoiding sunlight when possible. In addition, application of a broad spectrum, high SPF (30+) sunscreen and wearing protective clothing can reduce the effects of UV light.

<http://www.webmd.com/drugs/drug-3956-Tretinoin+Top.aspx?drugid=3956&drugname=Tretinoin+Top>
<http://www.nlm.nih.gov/medlineplus/druginfo/medmaster/a682437.html>

Sunscreens

Sunscreens are topical creams that are applied in order to minimize the damaging effects of the sun on exposed skin. While it is best to avoid tanning and direct exposure to sunlight, sunscreen can act as a protective agent against damage by UV radiation. Sunscreen can be purchased in various forms, with a large range in the strengths and ingredients available to consumers.

One of the most important things to note about a sunscreen when purchasing it is its SPF, or Sun Protection Factor. A higher **SPF** indicates more protection against UVB rays. The SPF value indicates the ratio of time that a person can stay in the sun before being sunburned with and without wearing sunscreen. For example, a person wearing an SPF 15 sunscreen can remain in the sun 15 times longer than they normally could before they are burned. Those with sensitive skin are advised to wear SPF 30+ sunscreen. For people with darker or less sensitive skin a weaker sunscreen may be sufficient.

Another important quality to note when finding a suitable sunscreen is whether or not it is a **broad-spectrum** sunscreen. The skin can be damaged by both UVA and UVB rays from the sun. As mentioned, the SPF of a sunscreen indicates its ability to block UVB rays, which cause sunburn. UVA rays, however, are also responsible for damaging the skin, but will cause wrinkles, skin aging, and other long-term effects. In order to minimize the chance of such damage, it is important to purchase a broad-spectrum sunscreen that also blocks UVA.

Although the purpose of sunscreen is to reduce the damaging effects of sunlight on the skin, it can actually cause an increased sensitivity of the skin in a minority of the

people that use it. The following details those ingredients that have been found to increase sensitivity of the skin to UV rays.

PABA, or para-aminobenzoic acid, and its derivatives have been linked to increasing the sensitivity of the skin and to causing a particular DNA defect in some of those that are exposed to it. Users that experience this response will observe their skin to become red and irritated. It is important to wash away the sunscreen in this situation and to switch to another type that does not contain PABA. This compound is rarely found in sunscreens anymore due to its photosensitizing qualities.

Cinnamates are substances used in sunscreens to protect the skin from the UVB rays of the sun. One cinnamate in particular, commonly known as Parsol MCX, tends to be insoluble in water, causing the products that contain the compound to be labeled as 'waterproof.' Cinnamates occasionally result in allergic reactions, although this response is much less common than the reaction caused by PABA.

Benzophenones are commonly used UVB absorbers. Benzophenone-3 is the most prominent member of the group to be found in sunscreens due to the fact that it also absorbs UVA II, classifying it as a broad-spectrum absorber. This group has been found to be one of the most common sources of photosensitive reactions in the United States.

Salicylates were the first group to be used in the US as sunscreen. Today sunscreens are largely composed of octyl salicylate, which is a weak UVB absorber. Because it is not very powerful, sunscreens can use large amounts of it without causing damage to the skin. In addition, salicylates have the ability to dissolve other sunscreen components that are not readily soluble (such as benzophenones), but the salicylate itself

remains insoluble in water. Salicylates can cause an allergic reaction, but this is rather uncommon.

<http://www.clevelandclinic.org/health/health-info/docs/3700/3768.asp?index=12171>

http://www.medscape.com/viewarticle/528577_7

<http://www.webmd.com/drugs/drug-61926-Paba+Suntanning+Top.aspx?drugid=61926&drugname=Paba+Suntanning+Top>

Fragrances

Certain fragrances have been characterized as inducing photoallergic reactions. These substances cause contact dermatitis, in which the skin most often develops a rash of small red bumps and inflamed skin. This outbreak most commonly develops on the face, arms and hands and can appear between a few minutes or up to two days following exposure to the irritant. An allergy to certain fragrances can be tested by using an allergy mix test that detects about 75% of fragrance-related allergies.

A common fragrance irritant is **musk ambrette**, which is a synthetic substance that causes a contact dermatitis that is usually found on the face. It has been used for more than 60 years and is found in soaps, detergents, creams, and lotions.

Another common irritant is **coumarin**, which is the common name for the molecule 6-methylcoumarin. This fragrance has a sweet vanilla-like smell and has been observed to be an anti-fungal and blood thinning agent. This substance has also been observed to cause contact dermatitis.

<http://www.allergyclinic.co.nz/guides/37.html>

<http://dermnetnz.org/dermatitis/fragrance-allergy.html>