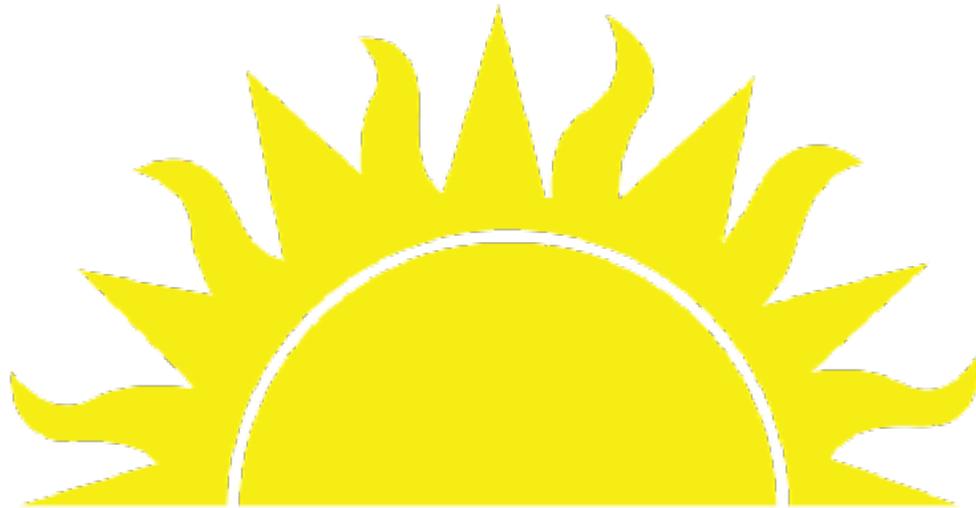


# Guide to PUVA Therapy



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## OVERVIEW

PUVA therapy consists of taking a medication called psoralen (pronounced soralen with a silent P) and subsequent exposure an hour later to ultraviolet A light. The name is an acronym from P in psoralen and UVA.

PUVA treatment is both old and new. Psoralens are naturally occurring chemicals found in the seeds of various plants. For more than 2,000 years herbal teas prepared from these seeds have been used in combination with sunlight, which contains UVA light, to treat skin disorders in India and the Middle East. However, the modern use of PUVA treatment resulted from two important developments. First, pure psoralen was isolated from plants in 1947 and this permitted the use of precise doses of the medication. The pure psoralen was introduced in the USA in 1952 for treatment of a skin disorder called vitiligo and in combination with sunlight, it was a moderately successful treatment. The second major advance was the development of a high-intensity source of UVA radiation at Harvard in 1974. This permitted giving short and precise doses of UVA light so that sunlight, an unpredictable and unreliable source of UVA light, has been almost entirely eliminated in modern PUVA treatment.

Development of a precise form of PUVA treatment resulted in an explosion of interest in determining how the treatment works and what disorders of the skin might benefit from the therapy. Several thousand articles have now been published in the scientific literature as a result of study of these questions in many centers throughout the world. All the answers are not yet know but PUVA therapy is beneficial in more than twenty different diseases and it appears to act via at least two different mechanisms:

### **1. Killing of Cells in Skin**

A number of skin disorders appear to be produced by cells from the immune (defense) system of the body. These cells are either multiplying too rapidly or behaving in an abnormal manner. PUVA treatment selectively kills off these cells and, fortunately, it can do this without producing any clinical evidence of harm to our normal immunity. Psoriasis, eczema, lichen planus, alopecia and mycosis fungoides are a few of the diseases that appear to respond to PUVA therapy via this mechanism.

### **2. Production of Increased Resistance to Sunlight**

PUVA therapy induces increased pigmentation in the skin and also increases the thickness of the epidermis. Both these effects diminish sensitivity to sunlight by decreasing the amount of ultraviolet light entering the deeper layers of the skin. This appears to be the mechanism whereby PUVA treatment is beneficial in disorders characterized by heightened sensitivity to sunlight, such as polymorphous light eruption and solar urticaria. The response of vitiligo to PUVA therapy is also partly due to this effect, but in addition PUVA is probably also affecting the function of immune cells in this disorder.

Let us now turn to the basic elements of the treatment before discussing the actual treatment process.

## **UVA LIGHT**

Sunlight consists of a spectrum of so-called electromagnetic radiation ranging from cosmic rays to radiowaves. Ultraviolet light consists of wavelengths shorter than visible light and is called ultraviolet because it begins next to the violet end of visible light. Visible light is light that we can see and it provides us with vision. Ultraviolet light is invisible to the human eye.

Ultraviolet light is divided into UVA, UVB and UVC. UVC light is only of interest to astronauts since it is absorbed by ozone in the atmosphere and does not reach the surface of the earth. UVB light does reach earth and this waveband is responsible for producing a sunburn and a suntan when we are exposed to sunlight. Sunlamps mainly emit UVB light.

UVA light is composed of the longest wavelengths in the ultraviolet spectrum. Under normal conditions UVA light from sunlight does not produce any noticeable change in skin.

## **PSORALENS**

These are a family of photosensitizing compounds which are activated by UVA light. Thus, if they are present in skin at the time of exposure to UVA light, they greatly increase the effect of the light on skin. This increased sensitivity is the key to the

beneficial effect of PUVA treatment of skin disorders.

It is important to emphasize that psoralens alone have no effect on the skin or skin disorders. Likewise, UVA light alone produces no noticeable change in the skin or beneficial effect on skin disorders.

The psoralen most frequently used in treatment has the chemical name of methoxsalen and the trade name of Oxsoralen Ultra in the United States.

## **THE TREATMENT**

PUVA therapy involves the ingestion of psoralen and then exposure to UVA light one hour later. The dose of psoralen you take is held constant and is determined by your weight. The interval between taking psoralen and being exposed to light is also held constant because peak levels of psoralen in the skin are usually reached between one and two hours after ingestion. For example, if you take your Oxsoralen capsules at 11 a.m. you should aim to be treated at 12 noon and certainly before 1 p.m. Take the capsules with water and avoid eating until after the treatment.

The variable in the treatment is the dose of UVA light you are given. The initial dose is low and determined by either your past history of sunburning and suntanning or by testing your response to PUVA. The dose of UVA light is gradually increased in subsequent treatment as your tolerance to the treatment increases.

The dose of UVA light is measured in joules per square centimeter, which is an amount of energy, and this is translated into a certain number of minutes of treatment. The output of the treatment units varies over time and different units emit different amounts of energy. Therefore, even if your dose of UVA light is constant, the time for your treatment will vary from day to day. Treatment will be required 2-4 times each week until your skin disease has cleared. Less frequent treatment is necessary to maintain a clear state.

## **SHORT-TERM PROBLEMS OF THE TREATMENT**

The immediate side-effects which arise during treatment are usually minor and easily managed.

## 1. Erythema (Redness and Burns)

PUVA therapy, if given in sufficient dose, will produce redness of the skin in much the same way as does excessive exposure to sunlight. However, the redness from PUVA treatment is delayed and does not appear until 36 to 48 hours after treatment. In addition, the redness lasts longer and can persist for a week or more.

The dose of PUVA therapy you are given is selected to produce improvement in your skin disorder and at most a light pink color in your skin. The pinkness should not cause you any discomfort. However, the response of different people to PUVA therapy does vary and about 10% of patients develop tender redness at some time during a course of treatment. If you are red, you must not be treated. Bring the problem to the attention of the nurse and your dose of treatment will be adjusted.

It is important to remember that after taking Oxisoralen your skin gradually becomes sensitive to UVA light so you are sensitive to sunlight before you have a treatment. Following your treatment your skin remains sensitive to UVA light for at least another six hours. If you are exposed to sunlight before or after your treatment, it is equivalent to having a second treatment. Therefore, try to avoid exposure to sunlight for the remainder of the day after taking psoralen.

Everyone has some exposure to sunlight just by coming to have a treatment but this exposure can be minimized by:

- ∞ Wearing slacks and a long-sleeved shirt.
- ∞ Using a broad-brimmed hat and gloves.
- ∞ Applying a broad-spectrum sunscreen, with at least SPF 15, after your treatment.

Clouds do not screen out UVA light, so take the same precautions on an overcast day as you would if the sun were shining. Also UVA light penetrates through window glass, so the same precautions must be taken in the car or a sunlit room.

Finally, a number of drugs contain photoactive agents and these can augment the

effect of PUVA therapy and result in an erythema. While on a course of PUVA therapy please inform us of all medications you are taking. Perfume and cologne may also contain photo-active agents so put them on your clothes and not your skin on the day of treatment.

## **2. Tanning**

Any person who can suntan will tan as a result of PUVA treatment. Most people consider this effect to be desirable but some people prefer not to have a darker skin. The tan produced by PUVA treatment last for 8 to 12 weeks after stopping the therapy.

## **3. Nausea**

Oxсорalen Ultra causes nausea in some people. If this occurs eat a snack, low in fat, immediately after taking the medication. If nausea still occurs, discuss the problem with the nurse and/or physician.

## **4. Pruritus (Itching)**

PUVA therapy dries the skin and this may cause itching. This is remedied by regular application of emollients such as Vaseline, CeraVe, Aquaphor or other moisturizing lotion.

## **POTENTIAL LONG-TERM PROBLEMS OF THE TREATMENT**

PUVA treatment, just like ultraviolet light in sunlight, can have cumulative effects on the skin and eyes.

### **1. Skin Cancer**

Long-term exposure to PUVA therapy can result in skin cancer of the same types caused by chronic exposure to sunlight. Certain patients are at greatest risk:

- a. Those who have had x-ray treatment for their skin disease.

- b. Patients who have had skin cancer in the past.
- c. Fair-skinned individuals.

In most patients, the risk is only likely to be a consideration after several hundred treatments.

There are several precautions every person should take to reduce the risk of skin cancer:

- ∞ Avoid prolonged or excessive sunbathing unless it is a prescribed part of maintenance treatment.
- ∞ Male patients should wear an athletic support during treatment if their skin disorder does not involve the genital area because skin in this area is very sensitive to ultraviolet light.
- ∞ If your skin disorder does not involve the face, apply a sunscreen to this area before treatment because facial skin already receives a heavy exposure to sunlight and it is unwise to increase the exposure.
- ∞ Any new lump, bump or mole on the skin should be brought to the attention of the physician.
- ∞ Have a complete examination of your skin by your primary dermatologist at least yearly.

## **2. Cataracts**

Several studies in laboratory animals have shown that PUVA therapy, just like ultraviolet light from sunlight, can cause cataracts. This potential problem is completely avoidable by wearing correct eye protection during therapy. The following precautions must be taken by all patients:

- ∞ An eye examination by an ophthalmologist should be performed yearly.
- ∞ UVA-blocking plastic wraparound glasses must be used as eye protection.

- ∞ The protective glasses must be worn on the day of treatment from the time of taking OxSORALEN until sundown when outdoors, while driving a car or while indoors in a room lit by sunlight through a window.
- ∞ If you are treated late in the day, it is advisable to wear protective glasses if exposed to sunlight outdoors the following morning.

Shielding of the eyes on the day of treatment is an absolute requirement. Protective glasses are available from the nurse.

### **3. Freckles**

Exposure to sunlight causes freckling of the skin and in susceptible individuals, PUVA-treatment will also produce freckles. Freckles are small flat brown spots on the skin which usually fade after treatment has stopped but subsequent exposure to sunlight tends to re-activate them.

## **PREGNANCY**

The use of PUVA therapy has not been associated with any abnormalities during pregnancy or in children born of mothers who received PUVA therapy inadvertently while pregnant. However, no planned studies of the effects of PUVA therapy on pregnancy and developing infants have been conducted and OxSORALEN is not approved for use in pregnant women. Therefore:

1. No pregnant women will be treated with PUVA therapy.
2. If a woman becomes pregnant, treatment will be stopped.
3. Contraception is essential for women of child-bearing age.

1. If your skin disorder involves the scalp you have to help the light reach it. Short hair is obviously one answer. Hair bands and bobby pins should be used to hold hair off the face and neck.
2. If the disorder affects the skin under the nail, do not paint your nails.
3. Scales on the skin tends to block UVA light from penetrating. Try to remove as much scale as possible before each treatment by soaking or applying an emollient.
4. Regular, punctual treatments are the key to success with PUVA therapy. Missed treatment simply delay a good response and sometime lead to failure of therapy. If you are having problems keeping appointments, discuss the matter with the physician so a fresh approach can be developed.

## **THE NEXT STEP**

If you decide to proceed with PUVA therapy:

- ∞ Please arrange for an annual eye examination if your last eye exam was more than one year ago.
- ∞ We will provide you with a pair of protective sunglasses for a charge, or if you have your own, we will test them to see if they are UV protected.

**REMEMBER, WE ARE HERE TO HELP. IF IN DOUBT, ASK!!**