Guide to PUVA Therapy

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PUVA therapy is a well-established treatment for a variety of skin conditions, using a combination of light exposure and medication. This guide explains how the treatment works, what to expect during therapy, and how to prepare—so you can decide whether it's right for you.

Overview

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

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 natural 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 known 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.

Elements of PUVA Treatment: 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 does not reach the surface of the earth since it is absorbed by ozone in the atmosphere. UVB light does reach the surface of the earth and this waveband is responsible for producing a sunburn and a suntan when we are exposed to sunlight.

UVA light also reaches the surface of the earth and is composed of the longest wavelengths in the ultraviolet spectrum. Under normal natural conditions UVA light from sunlight does not produce any significant short term change in skin.

Elements of PUVA Treatment: Psoralens

Psoralens 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, from most sources of UVA light, the UVA light alone produces little noticeable change in the skin or beneficial effect on skin disorders.

The psoralen most frequently used in PUVA treatment has the generic name of methoxsalen and the trade name of Oxsoralen Ultra and comes in 10 mg capsules.

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 (methoxsalen) 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 in general, 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 by a meter 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)

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 Oxsoralen 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 entire day from the time of taking psoralen.

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

- Wearing long pants and a long-sleeved shirt.
- Using a broad-brimmed hat and gloves.

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, including all new or changed medications and antibiotics. Perfume and cologne may also contain photoactive 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

Oxsoralen Ultra (methoxsalen) causes nausea in some people. If this occurs, eat a snack containing some fat (i.e. cheese, nuts) 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 generally remedied by regular application of emollients such as Vaseline, CeraVe, Aveeno, Aquaphor, or other moisturizing lotion/emollient such as that provided in the treatment booth.

Potential Long-Term Problems of the Treatment

PUVA therapy, just like ultraviolet 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:

- Those who have had prior x-ray treatment for their skin disease.
- Patients who have had skin cancer in the past.
- Fair-skinned individuals.

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

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

- 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 each treatment because facial skin already receives a heavy exposure to sunlight and it is unwise to increase the exposure.
- **Have a complete examination of your skin by a dermatologist at least yearly.**
- Any new lump, bump or mole on the skin should be brought to the attention of the physician.

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:

- **UV-blocking protective plastic glasses/sunglasses must be worn as eye protection on the day of PUVA treatment, from the time you ingest the Oxsoralen Ultra (methoxsalen) until sundown.**
  - These protective glasses must be worn while outside, driving in the car and/or near a sunlit window at home or work.
  - The office sells glasses and/or we can check your personal sunglasses at your first treatment to ensure they block 100% UV.
- If you are treated late in the day, it is advisable to wear protective glasses if exposed to sunlight while driving or outdoors the following morning.
- You also must wear UV blocking glasses/goggles provided by the office during the PUVA treatment itself.

- A yearly eye examination by an ophthalmologist is essential.

3. Freckles and Photoaging

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.

PUVA Therapy and 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 formal studies of the effects of PUVA therapy on pregnancy and developing infants have been conducted and thus Oxsoralen Ultra (methoxsalen) is not approved for use in pregnant women. Therefore:

- No pregnant women will be treated with PUVA therapy
- If a woman becomes pregnant, PUVA therapy will be stopped.

Contraception is essential for women of child-bearing age.

A Few Final Important Helpful Hints

- If your skin disorder involves the scalp, you have to help the light reach it. Short hair is one answer. Hair bands and bobby pins should be used to hold hair off face and neck.
- If your skin disorder affects the skin under your nails, do not paint your nails.
- Scales on the skin tend to block UV light from penetrating. Application of emollient will facilitate the transmission of UV light and facilitate the removal of scale, both of which will increase the effect of therapy.
- Regular punctual treatments are the key to success with phototherapy including PUVA therapy. Missed treatment simply delays response to 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, you will first need to fill your prescription for Oxsoralen Ultra (methoxsalen). Once you have your prescription filled, please call the office (410-847-3700) so we can schedule the first PUVA treatment and orientation.

In addition, please:

- Schedule an annual skin cancer screening with a dermatologist.
- Schedule an annual eye exam if it has been more than one year since your last eye exam.
    - We certainly can begin PUVA therapy before you have had these two appointments, but baseline exams are important. Please schedule these now, if you have not already.
- Bring your UV protective eyewear to the office for the first treatment appointment. These glasses can be tested to ensure they block 100% UV. Alternatively, we can provide a pair for a small charge.

And most importantly, remember we are here to help. Please don’t hesitate to ask!