

## Phototherapy factsheet

Phototherapy (light therapy) refers to the use of ultraviolet (UV) light to treat moderate to severe eczema in children and adults. Phototherapy is a second-line treatment option that is only available at specialist clinics or hospitals.

To be considered for phototherapy, you need to have tried topical therapies and found that they do not control your eczema. You will then need to be referred to a dermatologist, who will assess your suitability for a course of phototherapy. Your treatment sessions will then be supervised by a nurse or a physiotherapist.

### What is ultraviolet light?

In nature, UV radiation is part of the electromagnetic (light) spectrum that reaches the Earth from the sun. UV wavelengths are classified as UVA, UVB or UVC. The latter has the shortest rays and is mostly absorbed by the ozone layer, so does not reach Earth. However, both UVA and UVB penetrate the atmosphere (90% UVA and 10% UVB). UV light is important for health (Vitamin D production) and is responsible for tanning and burning the skin. Excessive UV radiation causes skin cell damage, which can lead to skin cancer.

### How does phototherapy work?

Natural sunlight can help improve symptoms of eczema for some people by reducing the inflammatory response in the skin. Both UVA and UVB wavelengths are used to treat eczema. UV light appears to have an effect on the immune system. In particular it seems to reduce the number of cells called T-cell lymphocytes in the skin. These cells are involved in the inflammatory response and are known to play an important part in eczema. A reduced number of these cells results in less inflammation and an associated improvement in symptoms.

Phototherapy improves the skin gradually after several weeks of regular treatments. Treatments are given 2-3

times a week for 12-16 weeks. Treatment will start for 30 seconds and build up to a maximum of around 15 minutes. This is individual and will depend on how treatment is tolerated. The itching should reduce and the eczema slowly clear as treatment continues.

Phototherapy will continue for a maximum number of weeks until the skin is clear or almost clear, and the itching has improved. The phototherapy will stop after the prescribed individual course. It is very important that people attend sessions regularly (and do not miss sessions) to optimise the chances of success.

### Types of phototherapy

There are three types of phototherapy used in the treatment of atopic eczema – broadband UVB, narrowband UVB, and UVA. Sometimes other wavelengths of light, known as UVA1 and UVB, may be used.

### Broadband UVB phototherapy

In this type of phototherapy, the wavelength of treatment increases with each visit unless the skin becomes pink (in people with lighter skin tones). Broadband UVB is an older form of phototherapy and is not very effective at clearing eczema. This being the case, a different type of UVB, narrowband UVB (often referred to as TL01), is usually used instead.

### Narrowband UVB (TL01) phototherapy

With narrowband UVB, the light tubes produce a narrow part of the UVB spectrum. Two wavelengths – between 311 and 313 nm (nanometres) – penetrate more effectively into the skin than the older broadband sources and are able to reduce inflammation and itching and improve the flare of eczema. The dose of UV given at each treatment is also higher compared to the broadband dose, because many of the unwanted wavelengths that cause the skin to burn are excluded. Once clearance is achieved, narrowband UVB can often induce a longer period of clear skin. The time spent in the phototherapy machine at the beginning is very short, and gradually increases at each visit, until the treatment course has been completed.

### UVA phototherapy

This type of phototherapy uses longwave UVA light in conjunction with a photosensitising medicine called psoralen – a combination known as PUVA. Psoralen can be taken in tablet form 2-3 hours prior to each treatment, or added as a liquid to a bath of warm water in which a person soaks for 15 minutes. Alternatively, psoralen gel can be applied directly to small areas of skin. PUVA treatment is administered to the whole body in a stand-up cabin, or can be given to localised areas such as the hands and feet with smaller, compact machines. PUVA should not be used if you are pregnant or breastfeeding.

### How long and what dosage is a course of phototherapy treatment?

A course is usually given 2-3 times a week for UVB and 2 times a week for PUVA. Both UVB and PUVA courses last on average around 12-16 weeks – maybe longer for severe cases. Shorter courses may also be given. Sometimes, weekly 'maintenance courses' are recommended for a short period after clearance. It is important that you are able to commit to a course of phototherapy as it may take some weeks before you see the benefits of treatment.

UVA and narrowband UVB treatment sessions are administered with a dose of light called joules. A joule is a unit of light energy. Your dose (J/cm<sup>2</sup>) is individual and will depend on the colour of your skin (or skin type) or – more accurately – be determined by a baseline series of 6-10 small test doses of UV to your skin. Before you start a course of phototherapy, you will receive a series of small test doses by shining a UVB light onto small circles marked on your back or arm, which will then be read the next day. This determines the starting dose of phototherapy (based on skin sensitivity to UVB) and establishes a minimal erythema dose (MED) for UVB and a minimal phototoxic dose (MPD) for PUVA. Generally, the dose at which clearance is achieved is up to 5J/cm<sup>2</sup> of UVB and up to 15J/cm<sup>2</sup> for tablet PUVA. However, dosage depends on your skin type. Phototherapy needs to be tailored to the individual and very carefully administered and monitored. The number of joules you are administered will be recorded and records kept – there is a maximum number of lifetime joules.

### When is phototherapy used?

Phototherapy is used for children and adults with moderate to severe eczema that is not responding to conventional treatment with emollients and topical steroids. Phototherapy is not used if the person has a UV-sensitive dermatitis or a photo allergy disorder. People with these types of eczema are best treated in specialist clinics.

Narrowband and broadband UVB can be used in pregnancy and when breastfeeding, but PUVA should be avoided as the safety of psoralen has not been assessed in these circumstances.

### What can I expect from my first visit?

On the day of your phototherapy treatment, do not wear perfumes, deodorants, aftershave lotions or other cosmetic products, as these may make you more sensitive to light. Do not apply creams or ointments to your skin (this includes emollients and topical steroids).

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Phototherapy is usually given in a hospital clinic setting. To start with, a test dose is given to an area of your skin (if MED testing has not been done). The first few treatments are likely to be less than a minute, with the duration slowly increasing up to 15 minutes per session.

In order to prevent UVA wavelengths entering the eyes and possibly increasing the risk of cataracts in the long-term, protective goggles will be provided by the dermatology department to be worn during the actual treatment. These are similar in style to swimming goggles.

Glasses with UV protection also need to be worn for 12-24 hours after having oral PUVA. This is not necessary after bath PUVA. Bath PUVA does cause systemic absorption, but it is short-term, whereas PUVA tablets cause the whole skin to become sensitised for 24 hours, hence the need to wear glasses afterwards. Some units ask bath PUVA patients to wear glasses for a short time after treatment, but this is unusual. Since only a small area of the body is made light-sensitive with gel PUVA, there is no need to wear glasses after this type of treatment. The treatment clinic should be able to give advice on the type of sunglasses that are suitable. Clear UV coatings for non-tinted spectacles are also available.

Male patients must wear genital protection during both PUVA and UVB treatment.

As the light dosage increases throughout the course of treatment, if an area of skin is covered, it is important that it is always covered for every treatment (otherwise, it can burn with the higher dosage as it is not used to it). This is also important if you have a haircut or change your hairstyle. Keep hair down or tied up in the same style for every treatment.

### What are the side effects?

It is normal for people with a lighter skin tone to experience some mild redness within 24 hours of treatment. This usually resolves quickly and, if not

associated with discomfort, treatment will continue as planned. Despite efforts to prevent burning – i.e. by testing the skin's sensitivity to light using controlled incremental doses for each treatment, careful skin assessments and asking about any side effects at each visit – occasionally sunburn-type reactions may occur with all types of phototherapy. If this happens, it is important to contact the hospital for appropriate advice. Burning that lasts for more than 24 hours is considered to be an adverse effect. In this situation, you need to be reviewed by the healthcare staff looking after you.

Skin dryness is also a common side effect, so it is important to use your emollients after treatment.

Cold sores can affect 1 in 30 people who have phototherapy. Report any early signs of tingling or a painful bump developing on the lips to the phototherapy nurse. People with a history of cold sores triggered by sunlight should routinely wear total sunblock lip balm during treatments to prevent cold sores developing.

Sometimes psoralen tablets can cause nausea – adjustments can be made in relation to the type of psoralen tablet to try to prevent this side effect. Taking the psoralen with food can also help minimise nausea. It is important that patients taking the tablets with food do so with the same amount of food each time to ensure similar absorption and efficacy at each treatment.

As with exposure to natural sunlight, long-term use of UV light therapy can result in accelerated ageing of the skin (e.g. freckles and wrinkles). More importantly, there is a potential risk of developing skin cancer. The skin cancer risk is related to the overall number of treatments and doses administered and also any pre-existing risk factors for skin cancer in patients. There are treatment thresholds for referring patients for a skin cancer review. The thresholds are after 200 treatments with PUVA and after 500 treatments with UVB. People who reach either of these thresholds must be referred for a skin cancer screening review.

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When being treated, it is important not to add to the UV exposure with sunlight or sunbathing. Sunscreen (SPF50 or higher with a 4 or 5 UVA-star rating) must be applied every 2-3 hours when outside. Cover up with long-sleeved clothes and wear a wide-brimmed hat particularly on sunny days. Do not use sunbeds during the course of treatment. They would increase the UV dosage and could cause severe burning.

### Should I still use my emollients and topical treatments?

You should continue to use emollients during the course of phototherapy. However, do not apply them shortly before phototherapy treatment unless advised to do so by your healthcare professional. You may need to use a greater quantity of emollient, especially after treatment, as the skin will be dry. Some people with eczema find that phototherapy makes them itchier, so using emollients for washing and bathing will also help.

You may be advised to continue with topical steroids during the course of phototherapy because of the risk of irritation and flare. If the eczema is improving, the potency of topical steroids will be reduced depending on the individual and their flare pattern. Topical steroids can be stopped if all eczema has cleared (although the patient will continue to use emollients).

Occasionally, small localised areas of eczema remain – e.g. on the ankles or wrists – after a course of phototherapy, and these will require continued treatment with topical steroids.

Topical calcineurin inhibitors (TCIs) – Elidel and Protopic – should not be used on phototherapy days as they make the skin more sensitive to light, which may increase the risk of burning. Patients may be advised to continue with TCIs on non-treatment days.

### Is there anything I need to avoid while having phototherapy?

- Certain medicines can make you more sensitive to ultraviolet light, so let the phototherapy staff know what

you are taking (including any new prescribed or over-the-counter medicines and herbal products).

- Avoid additional UV exposure from natural sunlight or sunbeds.
- It is important to avoid perfumes, deodorants, aftershave lotions and other cosmetics before UV treatment as some of these products may make you more sensitive to UV light and cause patchy discolouration of the skin, which may take months to fade. Follow the advice of phototherapy staff about applying emollients on treatment days.
- Do not have your hair cut short while on a course of phototherapy – if your skin has not been exposed to light for some time, it can burn easily.
- Avoid growing facial hair while receiving phototherapy (unless you already have a beard or moustache).
- Avoid eating excessive quantities of carrots, celery, citrus fruits, figs, parsley and parsnips, as these foods can increase your sensitivity to light.

### Phototherapy for children

In children, phototherapy is used for severe eczema only, where other treatment options have failed and there is a significant negative impact on quality of life. Children should visit the clinic beforehand to see the light units and understand what they need to do. Initially, treatment is just for a few seconds and children quickly get used to the routine. The parent can remain by the unit and talk to the child; sometimes there is a window they can see each other through. Parents are occasionally allowed in the unit (but fully clothed to protect their skin) for the first few treatments until the child gets used to it.

### Is phototherapy the same thing as a sunbed salon in the high-street?

Phototherapy given in a hospital is not the same as using a sunbed. The high-street suntanning industry is unregulated – you will not know the amount of UV exposure you are receiving and your skin cancer risk will increase.

### You can buy UVB machines for small areas such as hands – are these any good?

With home kits you cannot track the amount of UV exposure you have had, and therefore safety cannot be properly monitored. Anecdotally, we do not hear of positive responses from these machines.

#### DISCLAIMER

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**Factsheet last reviewed November 2022.**

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