

# Pretreating sun exposure

**LED therapy beforehand could provide UVB protection on par with sunscreen**

## Quick READ

**LED therapy prior to sun exposure could provide UVB protection equivalent to SPF 15 sunscreen, an expert says.**

**By JOHN JESITUS**

SENIOR STAFF CORRESPONDENT

**Grapevine, Texas** — LED treatments performed prior to sun exposure could grant a UVB protection equivalent to SPF 15, according to a preliminary clinical study.

Limitations of traditional sunscreens include effects of water or perspiration, spectral limitations, user allergies and compliance, says Daniel Barolet, M.D., the study's lead author, clinical adjunct professor of dermatology, McGill University School of Medicine, Montréal, and chief scientific officer, Opusmed.

If dermatologists can use non-thermal high-power LED treatments to increase skin's resistance to UV-induced damage, he says, "One day, we may avoid having to apply a sunscreen or sunblock" before sun exposure.

This strategy could prove appealing for everybody, but particularly for patients with polymorphous light eruption (PLE), Dr. Barolet tells *Dermatology Times*.

For example, instead of exposing themselves to tanning parlor UV rays to establish a base tan, "which is harmful to the skin long-term, PLE patients could use prophylactic LED treatments. These involve a visible red light using specific parameters

and have no known side effects to date," he says.

### LED interest

Dr. Barolet says his interest in LEDs and similar technologies dates back more than 15 years. He began working with LEDs in earnest in the late 1990s, because "They're easier to modulate technically and were better able to treat large areas than the small spot sizes available with lasers," he says.

More recently, *in vitro* research into the use of LED treatment prior to sun exposure inspired him to test this modality *in vivo*, Dr. Barolet says.

These studies showed that, "If several treatments with near-infrared light are performed before UVB exposure, a state of cellular resistance against sun damage could be induced and potentially act as a good sunscreen," he says.

"We decided to test this method *in vivo*, using a well-established minimal erythema dose (MED) method used for sunscreen SPF determination," he says.

### Preliminary experiments

Indeed, Dr. Barolet says, a preliminary 2006 experiment involving three healthy subjects showed that treatment with noncoherent, non-thermal light in the red spectrum (delivered by the LumiPhase-R device; Opusmed, Montréal) was "clearly effective, achieving a significant response in the reduction of the erythema induced by UVB."

In early 2007, Dr. Barolet and his colleague, Annie Boucher, Ph.D., repeated this trial with 15 subjects (13 completed the study). Using the above device, they divided patients into four groups and treated each patient's side (right thigh) with the LumiPhase-R, prior to UVB insults. The left thigh was used as a control.

Each group received a given LumiPhase-R treatment regimen as follows: five sessions spaced over one week; five sessions a week for two weeks; two sessions a week for three weeks; and five times a week for two weeks (this group consisted of two PLE patients).

Following this treatment — called LED Photoprophylaxis — and one day prior to UVB exposure, investigators established each

### And because the treatment is

**nonthermal and nonablative, there is no pain, and no side effects or ocular risks are involved.**

patient's individual UVB MED, defined as the minimum UVB light dose producing redness in the next 24 hours.

"Once MED baseline was identified," Dr. Barolet says, "we exposed both anterior thighs to UVB following a standard MED protocol, and compared the LED-treated side versus control."

### Results

Results were significant, he says. "The thigh previously treated with LED was clearly protected when compared to control side, which is very promising."

In all groups, Dr. Barolet says, "The treatment helped. It provided more resistance to the skin, especially for areas exposed to one and two MEDs."

In particular, LED Photoprophylaxis increased the amount of UVB required to produce one MED, he

says. Patients also experienced less pain and burning sensation during UVB exposure, as well as significantly less erythema immediately and five hours after UVB exposure, he says.

"Moreover, it's clearly a treatment that's easy to do," Dr. Barolet says. And because the treatment is non-thermal and nonablative, there is no pain, and no side effects or ocular risks are involved, he says. As such, Dr. Barolet says LED Photoprophylaxis might one day prove beneficial in home-based treatments.

### Response to treatment

Patients' responses to the treatment furthermore appear to be dose-dependent. Increasing the number of LED treatments could achieve higher SPF, Dr. Barolet says.

Additional studies with larger patient cohorts are required, he says. But this study represents "the first step toward another indication for LED therapy. At the beginning, LEDs were mainly used and advertised for photorejuvenation."

However, he says, "Beyond skin rejuvenation, there are promising indications for which LEDs may be very useful."

In nature, visible and infrared solar wavelengths predominate in the morning, Dr. Barolet says. Around noon, UVA and UVB take over.

"Maybe as a natural evolutionary process," he says, "the skin is preparing for the mid-day UV insult with visible and infrared wavelengths emitted by the sun early in the day." **DT**

**Disclosure:** Dr. Barolet founded Opusmed in 1997.

### For more information:

www.aslms.org  
www.opusmed.com

