

Colored light sources lighting the way for new office- and home-based skin devices

SCHAUMBURG, Ill. (MARCH 15, 2011) –

While dermatologists have used lasers successfully for years to treat common skin conditions such as acne, rosacea and aging skin, it now appears that even non-laser lights may provide some of the same benefits. In fact, lights of different colors are being used in several in-office and at-home therapies that offer consumers an alternative to more expensive laser treatments, but all may not be equally effective.

“Non-laser light treatments for the skin can be more affordable than laser treatments – an appealing benefit that makes them more accessible to a larger number of people,” said dermatologist Murad Alam, MD, FAAD, chief of the Section of Cutaneous Surgery and Aesthetic Surgery, and associate professor of dermatology, otolaryngology, and surgery at Northwestern University, Chicago. “While lights offer technology similar to professional laser treatments, not all home devices deliver visible results.”

Colored Lights: A Spectrum of Uses for the Skin

Of all the uses of light therapy, treating active acne is supported by the most evidence in the medical literature, although this technology is still being evaluated. The consumer demand for light-based acne treatments stems from concerns in recent years over the use of many traditional oral therapies for acne. For example, Dr. Alam noted that more patients are developing resistance to oral antibiotics typically used for acne, and the use of isotretinoin for resistant severe acne has become more complex due to government controls.

One of the most popular in-office acne treatments cleared by the U.S. Food and Drug Administration (FDA) is blue-light therapy. Blue light (in the range of 405 – 420nm) seems to work by killing the acne-causing bacteria known as *propionibacterium acnes*, or *P. acnes*, which can cause inflammation in acne. In effect, blue-light therapy can help reduce acne by decreasing the amount of inflammation-causing bacteria.

“Although blue-light therapy is not as effective as oral antibiotics in clearing active acne, it appears to offer some degree of improvement for patients who are not good candidates for traditional acne therapies,” said Dr. Alam. “However, in-office treatments must be administered up to three times per week to be effective.”

Recently, some light-based treatments for acne have been introduced as over-the-counter devices for patients to use at home. Dr. Alam cautioned that the at-home devices have a small size opening through which the light passes, making them impractical for treating large areas of acne. The device also must be held steady for an extended period to treat one area of active acne, which can be difficult.

In addition, dermatologists are investigating red light (in the range of 600 – 950nm) therapy to treat acne, rosacea and wrinkles. Red light works theoretically by stimulating the skin’s energy making machine, known as the mitochondria. As such, stimulated mitochondria make older cells behave more like energetic youthful cells – which holds the key to red light’s anti-aging potential.

“There are a handful of office-based and at-home red-light devices being marketed to offer improvement in the appearance of aging skin, but more definitive research is needed before we can determine the effectiveness of this therapy,” said Dr. Alam. “Compliance appears to be one of the biggest hurdles for red-light devices, as the therapy requires multiple treatments over an extended period of time to produce a noticeable improvement in aging skin.”

Red light also is being used in photodynamic therapy (PDT) for the treatment of acne. For example, each of the two topically applied chemical solutions used in PDT to accelerate and improve the acne reduction process can be used in combination with blue light or in combination with red light (635 – 670nm) to improve the control of acne with lights.

Green-light therapy is another of the colored light treatments and is used in combination with red and yellow lights that may alter skin functioning. More research into this technology is needed.

“When light of wavelengths in the range of 532 – 595nm, or green to yellow, is used on the skin, it can reduce skin redness in some patients with age-related central facial redness and blood vessels, or rosacea,” said Dr. Alam. “But future research is needed to explore light therapy in this area of dermatology.”

Light Emitting Diodes (LED): A Versatile Light Source in Dermatology

Several of the at-home devices designed to fight acne use special types of lights called light-emitting diodes, or LEDs. Dr. Alam explained that LEDs – which were created in the 1960s but have traditionally only been used for displays on electronic devices – are semiconductors that transform electricity into light of various colors. More recently, it has become possible to make brighter LEDs and to make LEDs in many different colors, from ultraviolet to infrared wavelengths (247 to 1300nm).

“LEDs are significant biologically because they can modify the function of mitochondria within cells. This can have applications for dermatology, as LEDs may be able to improve wound healing by reducing inflammation, and improve sun-damaged skin by accelerating the growth of new collagen.”

In-office LED systems have been used for acne reduction and, in many cases, these are the light sources used in home acne-reduction devices. While home-use LED devices are based on the same principles as in-office LED devices, they tend to be lower powered and used without a photosensitizing chemical.

“Home-based LED devices may not replace LED therapies that dermatologists use in our offices for the treatment of active acne, but rather be an additional approach for patients and help to prevent and reduce breakouts through regular use,” said Dr. Alam.

Dr. Alam added that one of the main benefits of LED devices (and other light devices) for use at home is that they are relatively safe. These lights are gentle – not intense lasers – that only gently warm the skin. When used as directed, skin burns are unlikely. In addition, there are several built-in safety features with LED devices that are marketed for at-home use.

“Some LED devices will only activate when they are pressed against the skin and a trigger button is depressed at the same time,” said Dr. Alam. “Lights also may be programmed to only emit very low amounts of energy for the first 100 pulses. Once the user feels comfortable using the device, the energy automatically increases to a more therapeutic range. Furthermore, LED and other light devices for home use do not emit light energy at wavelengths that pose any danger to the eyes.”

While scientific research substantiates the effectiveness of in-office light treatments, there has been little research performed on many at-home light devices. In fact, Dr. Alam explained that many of the home-use devices are relatively underpowered and some are not approved for the indications for which they are marketed.

“The main benefit of at-home light devices is that they are less expensive than in-office light or laser procedures, and the procedures are safe if used according to the manufacturers’ recommended guidelines,” said Dr. Alam. “Since it is unclear whether these devices are relatively effective or more akin to purchasing ‘hope,’ consumers should discuss their treatments options with a dermatologist to ensure the best results for their individual conditions.”

Headquartered in Schaumburg, Ill., the American Academy of Dermatology (Academy), founded in 1938, is the largest, most influential, and most representative of all dermatologic associations. With a membership of more than 16,000 physicians worldwide, the Academy is committed to: advancing the diagnosis and medical, surgical and cosmetic treatment of the skin, hair and nails; advocating high standards in clinical practice, education, and research in dermatology; and supporting and enhancing patient care for a lifetime of healthier skin, hair and nails. For more information, contact the Academy at 1-888-462-DERM (3376) or www.aad.org.