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A woman with dark hair pulled back is shown from the chest up, splashing water. She has her eyes closed and a serene expression. The water is captured in mid-air, creating a dynamic splash around her. The background is a soft, light blue gradient.

Healthy Skin Starts with a Healthy Barrier

by Danae Markland

The skin is an amazing protective organ that we, as skin care professionals, have the exciting job of treating. Although every patient is different - from skin condition, oil production, and Fitzpatrick type - achieving healthy skin is always the desired result. With so many products and treatment options available, reaching this goal can at times be difficult. However, no matter what the patient's skin concerns, improving the appearance and function of the skin ultimately comes down to a healthy barrier.

The First Line of Defense

Although it is the only non-living layer of our epidermis, the skin's stratum corneum (SC) has the invaluable duty of providing a shield from the outside world. The SC is comprised of three vital components: the corneocytes, or dead skin cells; the lipid bilayer; and a combination of lactic acid, urea, salts, and amino acids that are collectively referred to as the skin's natural moisturizing factor (NMF). When functioning properly, the lipids act like plastic wrap that envelopes the corneocytes, sealing in the NMF and keeping this outermost barrier healthy and hydrated. Unfortunately, this barrier system is relatively easy to disrupt, leading to transepidermal water loss (TEWL), or the evaporation of our NMF.

Identifying the Problem

TEWL, impaired barrier function, and skin dryness are often synonymous. When TEWL occurs several essential functions, including desquamation, are not possible, which may lead to or exacerbate many common skin concerns. The most obvious presentation of impaired barrier and TEWL is dry, flaky skin; however, a dull, impacted appearance may also be an indicator.

While some patients have skin conditions such as rosacea or dermatitis where dryness is a symptom, many have developed the problem through improper product usage or environmental exposure. Research also has shown that production of both lipids and NMF decreases naturally with age, making improper barrier function the norm for patients over the age of 40. In addition, certain hereditary backgrounds may be more prone to TEWL. Studies have shown that African American and Asian patients often exhibit increased levels of TEWL in comparison to Caucasian patients. Finally, while it may seem counterintuitive, an overproduction of oil can be an indicator of TEWL. The skin is programmed to keep itself hydrated, and if there is not enough water moisture present, it may produce oil to overcompensate. Regardless of what is causing the impaired barrier, treatment will be similar for all patients.

Repairing the Shield

Rebuilding the skin's barrier is simple in theory; we must enhance and maintain water moisture in the upper layers of the skin. The difficulty lies in how this is accomplished. The NMF is a group of humectants, or hygroscopic agents, that increase hydration by attracting water from the dermis and, in locations with humidity levels above 85 percent, the environment. The first step in barrier repair is the use of topical humectants that will be used as a replacement for lost NMF.

There are multiple humectant ingredients available in topical products. Each performs a similar function but some are more effective than others.

Hyaluronic acid (HA) is a glycosaminoglycan produced naturally by the dermis. Adequate HA levels contribute to a plump, youthful appearance; however, we are not increasing dermal HA by applying this ingredient topically. HA, also listed as sodium hyaluronate, is used in skin care products because of its ability to attract up to 1,000 times its molecular weight in water moisture to the outer epidermis.

Sodium PCA is also known as the sodium salt of pyrrolidone carboxylic acid or NaPCA. Sodium PCA is a component of the skin's NMF, making it an excellent choice for barrier repair. Research has suggested that sodium PCA is able to attract 250 times its weight in water.

Honey is a multifunctional natural ingredient. Numerous studies have found that honey provides humectant action in addition to offering antibacterial and wound healing benefits.

Panthenol is pro-vitamin B5. This is a highly nutritive ingredient that offers several topical benefits. Not only is panthenol a potent hygroscopic agent, it also provides anti-inflammatory and antioxidant properties.

Urea is an incredible humectant that comprises 7 percent of the NMF. Urea is impressive because it is able to attract moisture to the outer layers of the epidermis as well as within the skin cells themselves. Our cells are equipped with water-channels called aquaporins that allow specific molecules, including water, urea, and glycerin to enter and hydrate internally.

Glycerin has been considered one of the most effective humectants for decades. Like urea, glycerin is able to hydrate all layers of the epidermis by attracting moisture on the surface and passing through aquaporins. In addition, glycerin's hydrating benefits increase with repeated application, indicating that the skin holds on to glycerin so it is able to continue working long after it is applied.

While humectants are a crucial aspect of enhancing barrier function, the use of these ingredients alone can actually increase moisture loss. By drawing water from the dermis into the outer layers of the skin without anything to trap in that moisture, it will evaporate and ultimately cause dehydration on all levels. To effectively increase hydration, the water moisture brought on by humectants must be retained by an occlusive agent.

Petrolatum is often referred to as the most effective occlusive agent available with studies indicating a 99 percent reduction in moisture loss. While it is effective, its greasy, heavy feel is not desirable; therefore, many products contain alternative, more cosmetically elegant occlusive agents.

Silicones include dimethicone, cyclomethicone, and cyclopentasiloxane; among others. These are a group of ingredients that provide excellent occlusive benefits with an incredibly light texture. Silicones are often used in makeup priming products, as their powdery finish leaves a smooth surface. These are excellent, non-comedogenic occlusives suitable for all skin types and conditions.

Squalane and other plant-derived oils. Squalane is an oil found in olives and wheat germ that is similar to human sebum without being comedogenic. This type of occlusive is unique because, by applying something that resembles its natural oil, the skin is less likely to over-produce its own pore-clogging sebum. In addition to squalane, all oils are considered to be occlusive. Borage, evening primrose, jojoba, and rosehip seed oils are all excellent options.

Niacinamide is a B vitamin that offers multiple topical benefits. It is a unique occlusive because, rather than sitting on the skin's surface to trap in moisture, it stimulates the production of the skin's natural lipids. In addition, niacinamide is an anti-inflammatory and antioxidant agent.

The most effective products will typically contain a blend of several humectants and occlusive ingredients that will work together to attract and maintain moisture on many levels. Products that improve barrier function do not have to be heavy and thick. Thin serums can be just as effective as dense creams and product selection should depend upon patient preference.

Lifestyle is also an important consideration when attempting to replenish the skin's barrier. It is often improper product use and unhealthy choices that can lead to or worsen TEWL. It is up to the clinician to arm patients with the information necessary to improve the health of their skin. The onslaught of at-home treatment masks, chemical peels, and exfoliating scrubs are tempting options for our patients. Although these are typically harmless when used as directed, most patients are under the false impression that if a little bit of something is good, more must be better. Prolonged or improper use of any exfoliating product can breakdown the skin's barrier. In addition, the overuse of certain ingredients, such as alcohol, glycolic acid, or the use of artificial fragrances and soaps can be drying and increase TEWL. Be sure to review current regimens at the initial consultation and explain the importance of following product recommendations. Patients should also be advised to drink adequate amounts of water each day and be conscious of alcohol consumption, salt intake, and other potentially dehydrating activities.

First Things First

As aestheticians, our goal is to correct our patients' main skin concerns. It is also our responsibility, however, to uncover why these issues may have surfaced. The disruption of the skin's barrier system is incredibly common and the inflammation it causes can worsen sensitive skin, rosacea, acne, hyperpigmentation, and visible aging. Hydration is key to healthy skin for all patients, no matter their skin type or condition. Recommending cosmetically elegant daytime and evening moisturizing products that contain a combination of humectants and occlusives and offering patient education on the importance of healthy lifestyle choices, can significantly improve treatment outcomes. 🇺🇸



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