

Implications of Corneotherapy and Reduction of Excessive Transepidermal Water Loss

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Preventive corneotherapy, a term coined in the 1990s by Albert Kligman, M.D., Ph.D., is becoming one of the most important principles of treatment in advanced skin care. The object of corneotherapy, topical delivery of active concentrates through the skin, is skin barrier homeostasis.¹ The ultimate development in the quest for understanding the stratum corneum is corneotherapy, focusing therapy toward correcting the defective horny layers.²

Dr. Kligman, a corneobiologist, explains, "Whenever you see inflamed skin, regardless of cause, the stratum corneum is leaky and permeable. But, if you repair the stratum corneum that tells the underlying tissues that they don't have to keep reacting like there's danger in the environment." Peter Elias, M.D., the world's leading corneobiologist, has also endorsed this outside-in therapy, according to Kligman.

"Constant formation of the well-differentiated outermost layer of the epidermis and its orderly desquamation are necessary for correct barrier function as fulfilled by the stratum corneum," according to Marek Haftek, M.D., Ph.D. The primary function of the epidermis is the production of stratum corneum. The epidermis and the dermis both have immune systems.³ The epidermis and its immune response to stratum corneum

disruption are germane to barrier function and repair and the regulation of transepidermal water loss (TEWL).

TEWL is controlled by the stratum corneum and is a normal part of the cellular activity. The stratum corneum regulates TEWL and helps prevent dehydration, holding the average TEWL to 2 to 5g/hr/cm².⁴ Excessive TEWL (e-TEWL) activates an inflammatory response in the epidermis and the dermis and initiates the repair process.⁵

Many factors contribute to e-TEWL including humidity below 40%, changes in skin pH, normal aging and disruption of the barrier. Correcting e-TEWL can be achieved by application of occlusive and semipermeable treatments.

Occlusive products suppress barrier recovery and reduce the epidermal proliferative response to an abnormal stratum corneum barrier. Semipermeable or breathable barriers, like Nurtrashield, do not slow barrier recovery and allow for normal cellular respiration.⁶

A fully occlusive therapy, like petrolatum or mineral oil, prevents TEWL. In doing so however, it slows epidermal maturation and reduces barrier repair. Further, occlusion of the skin increases the risk of infection and decreases the protection of the skin's normal pH mantle.⁶ Decreased TEWL may be achieved with occlusion however, the side effects of occlusion appear to outweigh its benefits.

Nutrashield is a semipermeable or breathable barrier which allows for normal epidermal proliferation and barrier repair. Nutrashield, when applied

as part of a corneotherapy plan, reduces e-TEWL and allows for the normal repair process to take place.

Olivamine™ and other specialty ingredients, in Nutrashield, like lipids, vitamins and antioxidants, aid in the repair process.

The skin repair process is dependent upon proper skin hydration as accomplished with normal TEWL. Skin repair and reduced inflammation can be positively affected through the use of Nutrashield as a semipermeable barrier to e-TEWL.

¹ Lautenschlaeger, H, Corneotherapy, Medica.de 24-27, 2004

² Kapes, B; Treatment from the outside-in – corneotherapy unveiled as a possible new directive for stratum corneum, Dermatology Times, Jul 1, 2004

³ Nickoloff B.J. Chapter 1 In: Nickoloff B J, ed. Dermal Immune System. Boca Ratan, FL: CRC Press 1993 1-6.

⁴ Fore J, The Epidermal Skin Barrier: Implications for the Wound Care Practitioner, Part 1, Advances in Wound Care, Oct 1, 2004

⁵ Grubauer, G, Elias, PM, Feingold ,R: Transepidermal water loss: the signal for recovery of barrier structure and function; Journal of Lipid Research, Vol 30, 1989 p 323-333

⁶ Aly R, Shirley C, Cunico B, Maibach H, Effect of prolonged occlusion on the microbial flora, pH, carbon dioxide and transepidermal water loss on human skin, J Invest Dermatol 1978; 71: 378-381