

Understanding Moisturizers and their Clinical Benefits

Selecting an appropriate moisturizer depends on the vehicle, skin type, and individual needs of the patient.

By **Jeanine B. Downie, MD**

Numerous over-the-counter products from skin cleansers to lotions promise “moisturizing” benefits. But what exactly does that mean? Presumably, a moisturizing skincare product is able to increase the hydration of the skin and/or prevent loss of hydration to restore the epidermal barrier. This is an important function of OTC skincare, which can contribute to improved epidermal barrier function, promote skin healing, and reduce susceptibility to insult. Yet, the degree to which any individual product achieves these goals varies tremendously from one formulation to another. Moisturizers contain lipids and ingredients with emollient, occlusive, and humectant properties.

It’s likely that OTC product recommendation is already a substantial part of your practice. An analysis of office-based physician visits between 1995 and 2000 (National Ambulatory Medical Care Survey (NAMCS)) assessed the rate of over-the-counter topical skin product recommendations by various clinicians. There were an estimated 36 million physician recommendations for OTC topical skin products. While dermatologists provided just over half (53.8 percent) of recommendations, pediatricians had the largest proportion of recommendations per prescription recommendation (OTC/Rx= 0.58). Moisturizers were the third most frequently recommended OTC products (13.4 per-



cent), trailing hydrocortisone (27.6 percent) and anti-infectives (23.4 percent).¹

To be prepared to offer patients recommendations on optimal skincare selection, clinicians must be familiar with the types of products available, the science of moisturization, and the products that may offer the most benefits to patients. Selecting an appropriate moisturizer depends on the vehicle, skin type, and individual needs of the patient. Below, I will provide an overview of moisturizer technology. The next edition will provide more information about specific products.

Terminology

Although “moisturizers” have been marketed for

years, it seems fair to say that the term has entered the consumer consciousness primarily over the last 20 to 30 years, as the personal care market has grown dramatically to include everything from hand and body lotions to facial creams to body butters and various types of “balms.” As marketers have attempted to differentiate their offerings with unique tags, the term “moisturizer” has gained wider public use as an easy way to refer to this rapidly growing product category. According to one industry analysis, hand and body lotions lead the skincare market, followed by anti-aging products.

From the standpoint of medicine or industry, there is no strict definition of a “moisturizer.” Nor are there strict criteria for lotions versus creams, which are almost always oil-in-water emulsions (o/w, though water in oil or w/o formulations are growing in popularity). “Moisturizing” ingredients typically fulfill one or more of the following three functions: humectant, occlusive, or emollient.

Humectants. Water within a topical moisturizer formulation is an essential ingredient, but it typically contributes little to the delivery of hydration to the stratum corneum.² In fact, water itself (regardless of soap or detergent use) is shown to be irritant to the skin under occlusion³ and can be associated with causing skin dryness. Therefore, the primary hydrating effect of moisturizers is provided via humectant ingredients, which attract and hold water in the skin, either by drawing it up from the dermis to the epidermis or from the environment into the epidermis. They can cause water to be evaporated into the environment and thus need to be used with occlusive agents to decrease or prevent more transepidermal water loss (TEWL).

Occlusives. Occlusives are ingredients that sit on the skin, creating a barrier to TEWL. Petroleum jelly is among the best known and most widely used occlusives, shown to reduce TEWL more than 98 percent. By contrast, other oily occlusives, which include mineral oil, silicone, and lanolin, reduce TEWL by about 20 to 30 percent.² They

form a hydrophobic film between corneocytes on the skin.

Emollients. It may be fair to say that “emollient” refers to the “feel” of a product, as emollients are ingredients that spread easily on the skin, helping to hold down desquamating corneocytes and fill any “gaps” between them. Emollients are typically oils and lipids that enhance skin texture and flexibility. This results in a smooth skin feel, or what has been termed “skin slip” in the commercial realm, and helps make the stratum corneum soft, supple, and flexible.² Emollients may be occlusive and/or humectant or neither. As they provide the immediate feel of moisturization, they rate high among consumers for product satisfaction.

Benefits of Moisturizers

Topically applied moisturizing formulations may confer numerous benefits for cutaneous health, however, it is important to note the variability in the effects of different formulations. Unfortunately, it is somewhat difficult to objectively quantify the effects of moisturizer formulations, and few products undergo controlled trials alone or in head-to-head fashion. Most moisturizer formulations are creams or lotions that have a combination of emollients, occlusives, and/or humectants as key ingredients. In one recent study, researchers validated an objective process for measuring the effects of topical moisturizers on changes in stratum corneum thickness, water gradients, and hydration *in vivo*,⁴ but it has only been used for a limited number of formulations. Of note, this initial study tested three different formulations, identifying significant differences in activity between them. With this caveat in mind, the following discussion will outline the potential benefits of well-formulated moisturizers, which can:

Treat and Prevent Dry Skin. What patients and clinicians perceive as skin “dryness” is not in reality a specific cutaneous symptom. Rather, as one researcher explains, dry skin “is characterized by

differences in chemistry and morphology in the epidermis depending on the internal and external stressors of the skin.”⁵ Nevertheless, moisturizers are shown to improve patient complaints of “dry skin.”⁵ Controlled *in vivo* studies demonstrate that moisturizers can treat skin dryness and prevent its return, prompting researchers to undertake a home-use study of moisturizers in patients with eczema.⁶ The home-use study results confirmed the benefits of a moisturizer for reducing skin dryness and irritation in eczema. Similarly, data show that use of a moisturizer alone (without concomitant medication use), decreased skin dryness in patients with psoriasis.⁷ Dry skin may require a higher oil to water ratio and thicker occlusive agents.

Provide Skin Protection. Studies confirm that regular use of basic moisturizers can reduce skin reactivity to irritants,⁸ although there are contradictory reports in the literature.⁹ It should be noted that formulations specifically designed to provide skin protection are also on the market and were not the subject of these studies.¹⁰

Reduce Therapy-associated Irritation. Certain active drugs are known to cause skin irritation, including topical retinoids. However, concomitant use of moisturizers is shown to reduce the irritation associated with many of these drugs.

Concomitant use of moisturizers is a validated and widely-prescribed strategy to reduce irritation associated with topical retinoid therapy.^{11,12,13} In a split-face trial of a moisturizer versus no skincare use, stinging, burning, tingling, and itching associated with topical rosacea therapy were significantly reduced on the sides of the face receiving moisturizers.¹⁴

The ability of moisturizers to reduce drug-related irritation has led many product formulators to devise vehicles that contain moisturizing ingredients (for more on this, see the publication *Vehicles Matter* available online at VehiclesMatter.com). However, the presence of moisturizing agents in a formulation may not provide adequate moisturization for each patient. The moisturizing capacity of

Possible Benefits of Moisturizers

- Treat and Prevent Dry Skin
- Provide Skin Protection
- Reduce Therapy-associated Irritation
- Prolong Benefits of Therapy
- Improve Stratum Corneum Health and Function

any formulation can vary due to patient-based considerations as well as pharmacologic and physiologic factors.¹⁵ Therefore, while optimized formulations confer important benefits, concomitant use of a second moisturizer is generally indicated.

Prolong Benefits of Therapy. It is common for clinicians to advise patients who are discontinuing corticosteroid therapy for atopic dermatitis, psoriasis, or other steroid-responsive dermatoses to liberally apply moisturizers in efforts to prolong the benefits of treatment. This strategy makes intuitive sense, and there is now objective evidence of its merit. Among patients with atopic dermatitis who responded to corticosteroid therapy, the regular use of topical moisturizers alone was found to maintain clinical improvement up to one month after treatment withdrawal.¹⁶ Urea-based moisturizers have been shown to decrease TEWL in ichthyotic and atopic patients.

Improve Stratum Corneum Health and Function. A number of topical moisturizing creams specifically formulated for the purpose of promoting repair of and improved function of the epidermal barrier have been developed in recent years and have assumed an important role in the management of atopic dermatitis and other diseases of barrier dysfunction. However, standard moisturizers are also shown to support epidermal barrier function.^{17,18} One study showed that use of a moisturizer containing dimethicone and glycerin, two common moisturizer ingredients, increased epidermal thickness, and improved barrier function (TEWL decreased by 13 percent), leading the authors to conclude that “even nonxerotic, photoaged skin may appear younger, benefiting struc-

19 Common Moisturizer Ingredients

Allantoin
 Botanical Ingredients
 Carbomer
 Cetyl Alcohol
 Colorants
 Dimethicone
 Fragrance
 Glycerin
 Glyceryl Stearate
 Mineral Oil
 PEG-100 Stearate
 Petrolatum
 Preservative Ingredients
 Propylene Glycol
 Stearic Acid
 Stearyl Alcohol
 Titanium Dioxide
 Tocopheryl Acetate
 Water

- *The Personal Care Products Council's CosmeticsInfo.org*

turally and functionally from routine use of moisturizers containing dimethicone and glycerin.”¹⁹

The Best Options

As previously noted, there is variability in the benefit provided by moisturizer formulations. Of note, some less expensive and lower-quality lotions tend to provide a primarily emollient effect, improving the skin feel temporarily, but not contributing to a long-term improvement in skin hydration or barrier function. Furthermore, formulations may contain fragrances, emulsifiers, and other “inactive ingredients” that may cause irritation and potentially contribute to poor barrier function.

Patients and clinicians should favor formulations containing recognized moisturizing ingredients. Simple petroleum jelly is a cost-effective and easily-obtained product that efficiently hydrates skin and improves barrier function. Its utility is limited, however, by the tacky skin feel of the ointment.

Data confirm the skincare benefits of ingredients like urea, lactic acid, dimethicone, and glycerine. Again, choosing an optimal moisturizer depends on the vehicle, skin type, and ultimate needs of each individual patient. In the next edition, I will review some specific moisturizer formulations that may be of benefit for pediatric patients. ■

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