

# ClinicalNotes

## The Importance of Topicals in a Multimodal Approach to Atopy

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Atopic dermatitis (AD) is a common, heritable pruritic dermatopathy that affects ≈10% of the canine population and has significant negative impacts on the quality of life of pets and their owners.<sup>1-4</sup> This life-long condition is caused by T-cell and cytokine-mediated inflammation of the skin secondary to hypersensitivities to various allergens, including plants, trees, weeds, molds, mites, insects, food ingredients, detergents, perfumes, and other irritants.<sup>1,5</sup>

Disease pathogenesis is complex and involves the interplay of heritable skin defects and environmental factors, resulting in an abnormal intercellular lipid envelope and altered skin proteins. The exact pathogenesis is unknown, but skin barrier defects are common. The development of AD involves increased skin inflammation, leading to exacerbation of skin barrier defects, increased transcutaneous allergen penetration, dysbiosis of cutaneous microbiome, and perpetuated inflammation.<sup>5</sup>

Studies demonstrate that disruption of the skin barrier in atopic dogs results in increased transepidermal water loss (TEWL) and worsening clinical signs.<sup>6-8</sup> Alteration of intercellular lipids of the epidermis is common in atopic dogs and contributes to increased TEWL, increased allergen penetration, and inflammation.<sup>9</sup> In canine AD, epidermal lipid lamellae have been shown to be highly disorganized and irregular, and concentrations of free fatty acids and ceramides are significantly decreased as compared with nonatopic dogs.<sup>10</sup> These features of AD can serve as therapeutic targets for improving clinical disease.

### The Multimodal Approach

Multimodal treatment of atopic dermatitis can result in better long-term outcomes and include treatments that support the skin barrier, reduce inflammation and pruritus, and target disease pathogenesis.<sup>1</sup> Different therapies can have varying goals, with some aiming to restore the disrupted skin barrier and others reducing inflammation and pruritic behaviors. Therapeutic options include topical therapy, low-allergenicity diets, dietary supplementation and nutraceuticals (eg, omega fatty acids), probiotics, ectoparasite control, and anti-inflammatory drugs (eg, antihistamines, glucocorticoids, oclacitinib, lokivetmab, modified cyclosporine). Allergen-specific immunotherapy is the only drug-free treatment that targets the primary disease pathogenesis and aims to switch the immunophenotype to one of immune tolerance. Published success rates of subcutaneous allergen immunotherapy in atopic dogs range from 51% to 64%, with success being defined as ≥50% reduction in clinical signs.<sup>11</sup>

### Key Takeaways

- Atopic dermatitis (AD) is a common condition of dogs, with ≈10% being affected.
- The pathogenesis of AD is complex, involving both environmental factors and individual factors, including abnormalities in the skin barrier of affected dogs.
- A multimodal approach that includes supportive and topical therapies formulated to target skin barrier defects can help improve treatment success in dogs with AD.
- DOUXO® S3 Calm shampoo and mousse were formulated with OPHYTRIUM®, an ingredient shown to improve the skin barrier.<sup>15</sup>
- DOUXO® S3 Calm shampoo and mousse have been clinically shown to improve both skin health and pruritus in atopic dogs presented with skin flares.<sup>15</sup>

One of the most important facets of AD management is restoration of the disrupted skin barrier. Topical therapy is the untapped secret to rapid and effective treatment for skin barrier disruption. It has the advantages of affordability, safety, and promoting antimicrobial stewardship. Topical therapy can also reduce dependence on systemic medications, which can have negative side effects; however, client compliance roadblocks can present the biggest challenge for veterinarians.<sup>12</sup>

## Successful Topical Therapy

There are numerous options for topical therapy in dermatology, which can be overwhelming for veterinarians. The first step in creating a treatment plan is to determine what is being treated. This will guide selection of the appropriate active ingredients. Once the desired ingredients are selected, consideration should be given to which product formulation is best for the patient and owner. Lastly, frequency of application should be considered.

## What Is Being Treated?

The 2 primary focuses of topical therapy in AD are skin barrier repair and controlling skin infections. Animals with AD have a disrupted skin barrier that must be repaired to control inflammation and pruritus as well as reduce occurrence of secondary bacterial and yeast infections. Skin cytology is an effective tool to guide therapy and determine when an infection is present.

## What Are the Active Ingredients?

Topical application of skin barrier-restoring products is the primary goal of topical therapy. Common active ingredients that target skin barrier repair, moisturization, and reduced TEWL include emollients, humectants (eg, colloidal oatmeal), OPHYTRIUM®, ceramides, sphingolipids, cholesterol, essential fatty acids, and hyaluronic acid. OPHYTRIUM® has the added benefit of being antimicrobial (eg, reduces biofilm formation and bacterial adhesion to keratinocytes) and anti-inflammatory (eg, reduces cytokines).<sup>13,14</sup> One study demonstrated that OPHYTRIUM® shampoo followed by OPHYTRIUM® mousse every 48 to 72 hours for 3 weeks significantly reduced inflammation and pruritus in dogs experiencing AD flares.<sup>15</sup>

If cytologic evaluation confirms the presence of infection, active ingredients must also target the bacterial and/or yeast organisms. Effective antiseptic ingredients include chlorhexidine, benzoyl peroxide, acetic acid, boric acid, hydrogen peroxide, povidone iodine, ethyl lactate, TrizEDTA, lime sulfur, sodium hypochlorite, N-acetylcysteine, and probiotics. Contact time of 5 to 10 minutes for shampoos prior to rinsing ensures enough time for the active ingredients to contact the skin.<sup>16</sup>

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## Which Formulation Should be Used?

There are numerous options for delivering active ingredients to the skin, including shampoos, sprays, wipes, mousses, lotions, ointments, emulsions, creams, gels, rinses, powders, and fluorescence photobiomodulation therapy. For patients with dense or long haircoats, trimming the hair will help improve contact of the active ingredients with the skin. Direct communication with the client can help ensure a proper formulation that fits with the client's schedule and physical abilities to successfully perform the treatment at home is selected.

## What Is the Frequency of Application?

Application protocols vary depending on the phase of disease. During an active flare, daily application of topical therapies is an effective way to restore the skin barrier and control infection, and using a combination of shampoo and leave-on products between baths can help reduce the frequency of baths, thereby enhancing client adherence. Shampooing twice weekly, along with using daily leave-on products, is an efficient strategy. Once flares are under control, application of topical products may be reduced.<sup>12</sup>

In one study using OPHYTRIUM®-based DOUXO® S3 Calm shampoo and mousse, dogs were shampooed on day 0, then received a mousse application every 48 to 72 hours for 3 weeks.<sup>15</sup> This protocol combining applications of shampoo and mousse resulted in a high level of pet owner satisfaction and compliance, with quick and significant improvement in both skin health and pruritus in atopic dogs presented with a skin flare.<sup>15</sup>

## Overcoming the Challenges

Client communication skills are critical when speaking with owners about topical therapy. Important points of discussion include the purpose of topical therapy, how it works, its proven efficacy, and how to properly apply the products. The veterinary team should work with owners to decide which formulations are easiest for them to implement at home and develop reasonable protocols.

## Conclusion

Topical therapy is an important part of treatment in AD patients. It is safe and effective and can provide immediate relief to the patient. However, compliance can often be the biggest challenge when implementing this therapy, making client communication key when developing a successful topical care plan. ●

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