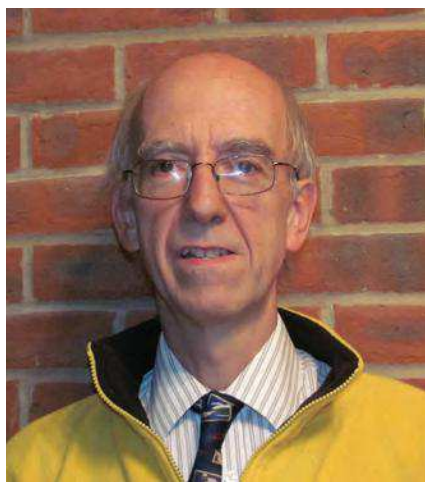




### Mark Craig BVSc CertSAD MRCVS

Mark Craig qualified from Liverpool University in 1985. After 5 years in general veterinary practice, Mark spent three and a quarter years as resident in dermatology at the Royal Veterinary College, where he gained his certificate in small animal dermatology. Since leaving the college in 1993, he has built up **Re-Fur-All Referrals**, a veterinary dermatology referral service in the South of England and the West Midlands.

Mark has written and lectured extensively on animal skin diseases, translated dermatology articles and text books from French to English, and presented papers at national and international dermatology congresses.

Re-Fur-All Referrals, 31 Porchester Road, Newbury, Berkshire, RG14 7QH

Tel: 01635 35600

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# Scaling and crusting in dogs: Part 2 – management

Treatment of scaling and crusting should be aimed at addressing underlying root causes. Secondary scaling disorders include allergies, ectoparasitic infestations, endocrine and metabolic disorders, immune-mediated diseases, and neoplastic conditions. Correction of secondary infections and treatment of underlying causes can lead to rapid clinical improvement. Topical therapy is indicated for most dogs with scaling and crusting, irrespective of the cause.

**Key words:** Scale, crust, therapy, shampoo, secondary, primary, management.

## Introduction



Scaling and crusting are common in canine clinical practice (see Part 1: *Vet CPD Journal*, Vol 2, Issue 3). For treatment to be effective in the long-term, underlying causes should be identified and addressed. Dogs with scaling and crusting, irrespective of the cause, however, are prone to staphylococcal and yeast infections which can in turn cause more scaling and crusting. A poorly-managed scaling and crusting disorder can be a source of discomfort to the dog and a source of unpleasant smells and greasy debris for its owners. Fortunately, correction of secondary infections and management of underlying causes can lead to rapid clinical improvement (Miller et al. 2013<sup>1</sup>) and reduction in smell. This article discusses aspects of topical and systemic therapy relevant to both primary and secondary scaling and crusting disorders. The number of primary and secondary scaling and crusting disorders is vast, and a full discussion of specific treatments for these conditions is beyond the scope of this article.

## Topical therapy

Topical therapy is indicated for most dogs with scaling and crusting, irrespective of the cause (Figure 1). A wide range of veterinary products is now available, including shampoos, spot-ons, sprays, mousses, pads, and conditioners. Moisturisers and anti-seborrhoeic agents are widely used, but many products also have antimicrobial, antiparasitic, anti-pruritic, anti-inflammatory, degreasing, and astringent properties.

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## Emollients and moisturisers

Emollients soften, lubricate or soothe the skin, typically by reducing water loss from the epidermis. Moisturisers increase the water content of the stratum corneum, the outermost layer of the skin. Examples include propylene glycol, glycerin, colloidal oatmeal, urea, lactic acid, sodium lactate and chitosanide. Both emollients and moisturisers are useful in hydrating and softening the skin and may, therefore, help dogs with chronic pruritus associated with dry skin.

## Antiseborrhoeics

### • Keratolytic agents

Keratolytic agents reduce cohesion between corneocytes thereby softening the stratum corneum and facilitating orderly scale removal. Examples include coal tar, sulphur, lactic acid, benzoyl peroxide, urea, and salicylic acid at higher concentrations.

### • Keratoplastic agents

Keratoplastic agents assist in restoring normal keratinisation and epithelialisation. Examples include coal tar, sulphur, selenium sulphide and salicylic acid.

Many shampoos contain keratolytic and keratoplastic agents (Figure 2).

## Agents to promote restoration of epidermal barrier

The epidermal barrier is altered in dogs with atopic dermatitis (Santoro et al. 2015) and defective in keratinisation defects, and some products are now marketed for maintaining and supporting the skin barrier.

### • Phytosphingosine

Phytosphingosine is present in the stratum corneum of normal skin, has been shown to increase levels of ceramides (key structural components of the intercellular

lipid cement in the stratum corneum), and improve skin barrier function in people when applied topically. Phytosphingosine is now included in various veterinary shampoos, spot-ons, mousses, sprays and pads (Douxo, Ceva Animal Health).

## • Fatty acids

A mixture of ceramides, fatty acids and cholesterol is present in Allerderm Spot-on (Virbac Animal Health). Essential fatty acids (EFAs) and essential oils are included in Essential 6 (Dermoscent Animal Dermo-Care). Both spot-ons are marketed in the UK for use in improving or supporting skin barrier function in dogs with skin problems.

## • Antimicrobials

Antibacterial and antifungal agents are indicated in the treatment of staphylococcal and yeast infections in dogs with scaling and crusting.

Topical antimicrobial agents commonly used include chlorhexidine, povidone-iodine, ethyl lactate, miconazole, and benzoyl peroxide. A recent literature review (Mueller et al. 2012) concluded there was good evidence for the efficacy of shampoos containing 2–3% chlorhexidine against staphylococcal bacteria, and for the use of a combination of 2% chlorhexidine and 2% miconazole in dogs with *Malassezia* spp overgrowth (Figures 3a and 3b). Malaseb (Dechra Veterinary Products Limited), Microbex (Virbac Animal Health) and Adaxio (Ceva Animal Health) are licensed in the UK for treating *Malassezia* dermatitis in dogs.

Recent additions to the UK market include PYOspot (Dermoscent Animal Dermo-Care) which contains PhytoC-2, a vegetable extract claimed to restore the balance of the cutaneous flora and soothe the skin by re-inforcing the skin barrier, and Douxo Pyo (Ceva Animal Health) which contains chlorhexidine, climbazole and phytosphingosine.

Antimicrobial activity has been claimed for other topical agents such as honey (Mueller, Bergvall, Bensignor and Bond, 2012), coconut oil (Kabara et al. 1972), tea tree oil (Halcon and Milkus 2004) and aloe vera (Shelton 1991). Further studies are required to evaluate their usefulness in managing canine skin disease.

## • Anti-parasitic agents

Many antiparasitic agents (e.g. fipronil, imidacloprid, selamectin, moxidectin,



**Figure 1:** Washing with an appropriate shampoo provides many benefits for dogs with skin disorders.



**Figure 2:** Truncal scale on a 1 year old German Short-haired Pointer with lupoid dermatosis. Antiseborrhoeic shampoos and EFA supplements were helpful in managing this dog's condition.



**Figures 3a & 3b:** Examples of scaling and crusting associated with *Malassezia* dermatitis typically respond well to topical antifungal shampoos.



**Figure 4:** Mild dorsal scale in Cavalier King Charles Spaniel with cheyletiellosis. Scaling resolved with appropriate ectoparasitic treatment

pyriproxifen, permethrin, amitraz) are delivered in spot-on formulations or aqueous solution (Figure 4).

## Clinical response

The clinical response to shampoos of dogs with chronic scaling disorders is quite variable. Most patients should probably be washed 2–3 times weekly until clinical improvement is noted. A shampoo is selected according to the nature and severity of the lesions and should always be used in accordance with

manufacturer's instructions. Typically, washing and drying a dog thoroughly takes 30 minutes or more and many dogs do not enjoy the process! After a shampoo has been applied, it should remain in contact with the skin for about 10 minutes before being well-rinsed. Rinsing, which should take 2–3 times longer than lathering, removes debris and shampoo and helps to hydrate the skin (Miller et al. 2013<sup>3</sup>).

Inappropriate shampoos or overuse can increase scaling and irritation. A mild product should be used initially before changing to a stronger one if clinical response is unsatisfactory. For mildly flaky, dry skin, moisturising or emollient-based products should be used. In more severe cases, shampoos containing sulphur and salicylic acid may be indicated. For greasy skin, selenium sulphide and benzoyl peroxide can be helpful although there is currently no benzoyl peroxide-containing veterinary shampoo available in the UK. Pre-washing with a non-medicated shampoo helps to remove general debris and allows better contact of the antimicrobial or antiseborrhoeic product with the skin, thereby increasing efficacy.

Shampoo therapy is not always successful. Some dogs resist being washed and some owners are unable or unwilling to wash their dogs effectively on a regular basis. Mousse, pad, spray and spot-on formulations are now available to deliver active agents, and can be used in place of, or alongside, shampoos.

Clinical response to topical therapy is sometimes improved, especially in long-haired dogs, if the coat is clipped (Miller et al. 2013<sup>2</sup>).

## Systemic therapy

Systemic therapy may be indicated in more severe cases and when topical therapy alone has proved inadequate or unsuccessful.

### • Antibiotics

Antibiotics are often required to treat secondary staphylococcal folliculitis (Figure 5). The chosen antibiotic should be effective against *Staphylococcus pseudintermedius* with 1–2 times daily dosing, safe, bactericidal in action, cost effective and palatable. This ideal cannot always be realised and compromise is often necessary.

Systemic antibiotic therapy should be given for at least 3 weeks, and ideally for between 7 and 21 days *after* surface healing, depending on the original depth of infection. It is hard to be completely prescriptive, and treatment should always be customised to individual circumstances.

### • Glucocorticoids

Glucocorticoids inhibit cell replication and provide anti-inflammatory and anti-pruritic activity that can be very helpful for dogs with scaling and crusting. If pruritus continues to be an issue, despite adequate control of underlying problems (e.g. ectoparasite infestation and microbial infection), an initial daily dose of (methyl)prednisolone 0.5–1 mg/kg can be given until a sustained, favourable clinical response is seen (Figure 6). The time required is hard to predict and will vary from dog to dog. In order to minimise the considerable risk of adverse effects, the dose should then be slowly tapered to the lowest possible alternate-day level that gives satisfactory control. In many cases, glucocorticoid administration allows the itch-scratch cycle to be broken, and patients can then be weaned off completely, often for weeks or months.



**Figure 5:** Scaling, crusting and epidermal collarettes in a 4-year old male neutered crossbreed. Lesions resolved fully with systemic antibiotics



**Figure 6:** Systemic glucocorticoids are sometimes indicated when severe pruritus is contributing to crusting and scaling



**Figure 7:** Scaling and crusting on the dorsal head of a 10-year old Jack Russell terrier with dermatophytosis



**Figure 8:** The same dog as in Fig 8 following about 2 months of systemic and topical antifungal medication

### • Cyclosporin

Cyclosporin, a potent, cytotoxic, immunosuppressive agent, may be helpful in some cases of scaling and crusting. Atopica (Elanco Animal Health), Cycavance (Virbac Ltd), and Modulis (Ceva Animal Health), are licensed for the treatment of canine atopic dermatitis. Clinical improvement may take 4–8 weeks.

### • Oclacitinib

Oclacitinib (Apoquel, Zoetis UK Limited) is licensed for the treatment of pruritus associated with allergic dermatitis and the clinical manifestations of atopic dermatitis in dogs. Its anti-pruritic effects are rapid in onset and may be accompanied by anti-inflammatory actions (Gonzales et al. 2013).

### • EFA supplements

Omega-3 and omega-6 supplements are often given to dogs with allergic conditions and keratinisation defects though rarely provide complete control (Craig, 2008; Miller et al. 2013<sup>3</sup>) (Figure 2). Many products are available and should be used in line with manufacturer's instructions. EFAs are now also added to many commercial foods.

### • Antifungal agents

Itraconazole (Itrafungol, Elanco Animal Health) is effective against dermatophytes and *Malassezia* but unlicensed for use in dogs (Figures 7 and 8). Most cases of *Malassezia* dermatitis respond well to topical therapy and systemic therapy is rarely indicated. The standard recommended dose is 5–10 mg/kg every 12–24 hours but other protocols have been used including 5 mg/kg for 7 days every other week (dermatophytosis) and 5 mg/kg for 2 consecutive days each week for 3 weeks (*Malassezia* dermatitis). Liver enzymes should be monitored every 2 weeks (Miller et al. 2013<sup>4</sup>).

### • Retinoids

The term retinoid refers to all chemicals, natural or synthetic, with vitamin A activity. Synthetic retinoids are primarily derivatives or analogues of retinol, retinoic acid, or retinal. All retinoids have variable antiproliferative, anti-inflammatory and immunomodulatory effects and are widely used in people with acne, psoriasis and other hyperproliferative, keratinisation disorders. Although efficacy has been reported in many primary keratinisation defects in dogs, there are many potential side-effects and retinoids are not commercially available for dogs in the UK.

## Diet

Dietary factors play a major role in the maintenance of healthy coat and skin (Watson 1998). It is important to ensure that the patient has access to a diet supplying sufficient amounts of all vital nutrients, and that adverse food reactions are investigated and addressed.

## Conclusion

For treatment of canine scaling and crusting disorders to be effective in the long-term, underlying causes should be identified and addressed. Topical therapy is indicated for most dogs with scaling and crusting, irrespective of the cause. Systemic therapy may be indicated in more severe cases and where topical therapy alone has proved inadequate or unsuccessful.

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## March 1-21, 2016 Canine atopic dermatitis: Have we even scratched the surface?



Mark Craig

BVSc CertSAD MRCVS  
Canine atopic dermatitis (CAD) is one of the most common conditions encountered by vets in

small animal practice. In this course, we will explore the pathogenesis of this complex, challenging phenomenon, along with clinical signs, diagnosis, and treatment. Reasons for the apparent increased incidence of CAD, and the likelihood of developing safe, effective, alternative therapeutic strategies in the future, will be discussed. A number of case studies will be presented allowing delegates the opportunity to review and test their knowledge and diagnostic skills. An online, interactive forum will be available for discussion of downloadable course material.

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### 1. Which of the following statements is/are most accurate?

- A) Phytosphingosine reduces cohesion between corneocytes thereby softening the stratum corneum and facilitating scale removal
- B) Keratolytic agents have been shown to increase levels of ceramides and improve skin barrier function
- C) Keratoplastic agents assist in restoring normal keratinisation and epithelialisation.
- D) All of the above

### 2. Which of the following agents are keratolytic?

- A) Coal tar, sulphur, lactic acid and urea
- B) Coal tar, sulphur, selenium sulphide and glycerin
- C) Coal tar, salicylic acid, urea and propylene glycol
- D) None of the above

### 3. Which of the following agents are included in spot-on preparations for dogs in the UK?

- A) Phytosphingosine, fatty acids, ceramides
- B) Phytosphingosine, sulphur, oclacitinib
- C) Sulphur, salicylic acid, selenium sulphide
- D) All of the above

### 4. A recent literature review found good evidence for the efficacy of which of the following antimicrobial agents against staphylococci?

- A) 2-3% ethyl lactate
- B) 2-3% chlorhexidine
- C) 2-3% miconazole
- D) All of the above

### 5. Which of the following statements is most accurate?

- A) Rinsing a shampoo should take as long as lathering
- B) Rinsing a shampoo should take 2-3 times as long as lathering
- C) Rinsing shampoos is unnecessary
- D) Rinsing a shampoo should always take 5 minutes