UNIVERSITY OF CALGARY
FACULTY OF VETERINARY MEDICINE

This review accompanies the relevant episode of the Cutting Edge veterinary podcast. In each episode of this podcast, 3rd year students in the University of Calgary's veterinary medicine program fill you in on the most up-to-date literature and evidence-based practices on topics that matter to you, the practising veterinarian.

"Making Derm Great Again": Integrating a spectrum of care approach into the diagnosis of canine atopic dermatitis (cAD)

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Introduction

Dermatological appointments are often considered the bane of a veterinary general practitioner's (GP's) workday. This is unfortunate as some reports show dermatological appointments make up 21.4% of a GP's caseload, with 30-40% of the dermatological cases presenting for canine pruritis (Hill et al. 2006). This "disdain for derm" may be because the pressure for a GP to rapidly reach a correct diagnosis in a timely and cost-effective manner, is not often obtained with dermatological workups (Hanna et al. 2022, Lundberg et al. 2022). On top of that, the dermatological toolbox for treating something like pruritis comes with various therapeutics and options, and finding the combination that works specifically for that owner and animal can be a long process of trial and error (Gortel 2018). Referrals to veterinary dermatologists provide a reliable option for dermatological cases, but are often used as a last resort if the GP is out of ideas or the client is frustrated (Hanna 2022). Unsuccessfully treated dermatological cases are now one of the main reasons clients lose faith in their veterinary-client relationship and decide to "vet-hop" (Hanna 2022). This is not only frustrating for the owners but also for the general practitioners trying to work with the time and resources they have available, and therefore presents a need for a more systematic approach for dermatological workups.

In this scientific communication paper, I will focus on the diagnostic work-up of a common and chronic dermatological disorder: canine atopic dermatitis (cAD). I will use evidence-based research to 1) discuss how spectrum of care medicine can be used with dermatological cases to meet a client's needs without compromising the standard of medicine, 2) briefly introduce some algorithms from Lundberg et al. 2022 and Miller et al. 2023 that simplify working-up a cAD case, and 3) introduce how and when referrals to veterinary dermatologists can be incorporated to ideally minimize client cost, while maintaining a GP-client relationship.

Spectrum of care medicine refers to evidence-based medical options that can be taken to better meet the economical and circumstantial needs of a specific client. Spectrum of care is most often related to client's financial circumstances but should apply to their entire circumstance as a whole and how that relates to the needs and medical care of their animal (Stull et al. 2018). With the rising costs of veterinary care, as well as increasing research and funding going towards more advanced tools to diagnose and treat certain conditions, it becomes difficult for veterinarians

(especially new grads) that strive to obtain "gold-standard medicine" and assume a client is always able to accommodate (Evason, Stein, and Stull 2022). This presents a risk of conflict between a client's ability to support the health of their animal, and a veterinarian's ability to confidently provide options. Spectrum of care medicine represents a movement away from "gold standard medicine" and towards "circumstantial medicine". This approach allows veterinarians to stand out in their profession by being able to confidently provide individual evidence-based options that work for their client's individual circumstances (Fingland et al. 2021). One of the largest barriers to spectrum of care medicine has been changing veterinarians' perspective that "gold-standard medicine" provides the "best medicine" (Stull et al. 2018).

The concept of a need for treatment "catered specifically to the client" is evidently revealed with dermatological patients. A successful diagnosis for most dermatological patients is heavily reliant on the clinician's ability to understand and prioritize certain diagnostics over others, to communicate why certain diagnostics are important and worth client's money, and to collaborate with an owner's expectations and abilities at home (Lundberg et al. 2022, Miller et al. 2023, Gortel 2018). Providing a SOC approach in dermatology does not just involve using the cheapest combinations of steroids and antibiotics for a financially conscious client, nor does it involve implementing every test and multimodal therapeutic to a more curious client (Johnson 2019). It involves an understanding of what combinations of diagnostics and therapeutics will give us information and relief for the animal, while being feasible for the owner now and for the duration of the disease. Skipping this part of the dermatological process can lead to a waste of diagnostic tests, improper use of client funds, and a break in client trust (Hanna 2022).

Stull et al. purposed that to properly introduce SOC medicine we need to 1) provide veterinarians with accessible and clear evidence-based options that they can confidently integrate options to fit the needs of their clients, 2) maximize the use of low-cost tools such as physical exams and history taking within a minimal timeframe, and 3) refine communication skills to get an understanding of patient expectations, needs, and values for themselves and their pets. In this paper I will use a work-up of canine atopic dermatitis (cAD) as a case study to obtain Stull et. al's SOC goals. My hope is to introduce the importance of SOC in dermatology, and how its integration can increase confidence in a GP's ability to approach dermatological cases using whatever time and resources available, and without compromising the standard of medicine.

Canine Atopic Dermatitis

Canine atopic dermatitis (cAD), also known as canine atopy, was traditionally thought of as genetically predisposed inflammatory allergic skin disorder, whereas more research has shown the increasingly complex multifactorial nature of this disease (Favrot 2016). cAD often presents to a clinician as pruritus and erythema, but also can involve secondary bacterial and ectopic parasitic infections that further complicate treatment (Outerbridge and Jordan 2021). cAD is a lifelong diagnosis that often presents in pruritic flares (Nuttall et al. 2019). Two important considerations when diagnosing and treating canine atopy is 1) differentiating it from other causes of pruritis and allergy as well as determining the major causes of flare ups, and 2) communicating the chronic and progressive nature of this condition to develop a successful long-treatment plan that meets the expectations and abilities of the owner.

cAD is a diagnosis of exclusion, often related to other causes of pruritis such as food allergy, skin infections, and ectoparasites (Favrot et al. 2010). Several publications that aim to simplify

the best approaches to diagnosing and treating canine skin conditions such as cAD (Olivry et al. 2015, Favrot et al. 2010,). A recent paper by Lundberg et al. 2022 presents a simplified approach to specifically diagnosing cAD purely at the level of a GP, whereas an AAHA 2023 article published an extensive accessible algorithm for the diagnoses and treatment of allergic skin disorders in dogs, while also highlighting the use of clinical staff and areas within the diagnostic process that can be integrated to provide an effective spectrum of care approach (Miller et al. 2023). For this project I will briefly highlight the major points of focus from these documents to introduce the importance of offering a SOC approach to diagnosing cAD. I will also discuss the role that referrals to veterinary dermatologists have within a SOC approach to dermatologic workups. The objective of this paper is not to reiterate the entirety of Lundberg et al. 2022 and Millet et al. 2023 (See Appendix 1; Figure 1. and Figure 2 for diagnostic flowcharts), but rather to introduce examples of where a SOC approach can improve the efficacy and confidence of working up a dermatological case at the level of a GP, and when throughout the process it may save time, cost, and frustration to consider a referral.

1. Diagnosing atopic dermatitis in a dog presenting for pruritis

    a) Gathering history

Taking time to gather a thorough history, particularly with dermatological cases, is a powerful and low-cost diagnostic tool that should not be overlooked (Lundberg et al. 2022; Miller et al. 2023). A thorough history can help at any stage of the cAD work-up by ruling out other differentials, understanding seasonal trends and potential causes of flares. For example, cAD can often (not always) have seasonality component at onset (42-72%), almost 80% of dogs with seasonal signs are symptomatic in the spring and summer (Favrot et al. 2010). A thorough history can also save time and financial costs, as well as provide a more concrete plan going forward, which can increase the confidence of the GP that can be communicated to the client (Lundberg et al. 2022; Miller et al. 2023). The key with history taking for dermatological cases is to 1) make sure the owner understands the questions asked, and 2) maximize the time needed to gather this information (Miller et al. 2023). This can also be a point of difficulty with the time limitations in an average GP appointment. Because an extensive history is so vital to understanding the pattern of the disease, certain sheets with essential information regarding the history of the animal can be filled out before the appointment. This can save time during the appointment and allow the GP time to review information in advance (see example: Lundberg et al. 2022). These questionnaires should use basic phrasing, avoid leading questions, and be translated into common languages to make them accessible to various educational and cultural backgrounds (Lundberg et al. 2022). Handouts can also include pruritic scales and introduce owners to how pruritis can present in animals, which is important to clarify when gathering a history and for continuous monitoring done by the owners (Miller et al. 2023). The Canadian AcADemy of Veterinary Dermatology also has an extensive collection of free client handouts on many veterinary dermatologic topics (see cavd.ca).

According to the AHAA 2023 review; the most essential historical information gathered to narrow the differentials for an itchy dog include:

1) Distribution and changes in distribution (ruling out ectoparasites; the distribution of atopy and food allergy is identical)
2) Seasonal, year-round, year-round with flare-ups (year-round pruritis is often associated with food allergy, atopy due to indoor allergens, or allergens in the environment that lack seasonality)

3) Age of onset (food allergies can be prioritized with very young and older patients), ectoparasites (any age), atopy (6 mo-3yrs)
4) Previous treatments and their responses (i.e. glucocorticoids)
5) Other pets / humans affected (potential zoonoses or infectious causes)
6) GI signs and fecal scoring (GI signs in 26% for food-induced cAD)

b) Signalment:

Taking time to understand the common signalment for a dog with cAD can be helpful when prioritizing a certain diagnosis over another, however the nature of cAD is that aside from pruritis, all other presentations are variable. Common age of onset of cAD is between 6 months and 3 years (78% show signs before 3 years of age) (Favrot et al. 2010; Lundberg et al. 2022). Certain breed dispositions are found in white highland terriers, boxers, and bulldogs, and in some regions German Shepherds, golden retrievers, and Labrador retrievers, however breed predispositions are not completely understood and many of these studies have limitations (see Favrot et al. 2010 for specific descriptions). It has also been shown that factors such as growing up in a rural environment, contact with other humans and animals, as well as a non-processed meat-based diet may be less likely to have cAD (Hensel et al. 2024). Knowing these environmental, age, and breed specifics can help favour certain differentials over others. For example, if the presentation was acute pruritis and alopecia in an 8-year-old Maremma, cAD may not be the top differential pursued at the time.

c) The physical exam

Despite the common sentiment that "all dermatological cases look the same", the physical exam is an important and low-cost test that is essential to rule out ectoparasites, and can also show trends that, when combined with the history, can allow for a tentative diagnosis (see Lundberg et al. 2022 and Miller et al. 2023 for more detail).

Some important steps within a dermatological physical exam for a pruritic dog are:
1) Flea combing which should always be performed even without an indicative history (Miller et al. 2023, Lundberg et al. 2022).
2) Otoscopic exam (even if the client does not note pruritis of the ears because 50% of dogs that have allergies will show otitis externa, and this can present as the first clinical sign (Favrot et al. 2010, Millet et al. 2023)

3) Distribution of the lesion (ectoparasites have a predictable distribution. Whereas distribution of pruritus for cAD or food allergy is identical (Favrot et al. 2010).

4) Examination of the eyes because seasonal conjunctivitis has been shown to occur in 60% of animals with cAD (Lourenço-Martins et al. 2011).

Along with the important components of a physical exam. The use of a minimum dermatologic database can help a general practitioner prioritize the “basic diagnostics” to diagnose a dermatological case. This is because cAD is a diagnosis of exclusion, and differentials such as demodicosis, dermatophytosis, cheyletiellosis, and in some cases cutaneous lymphoma need to be ruled out. Furthermore, any secondary bacterial and yeast infections will interfere with treatment of cAD and need to be addressed (Lundberg et al. 2022). Miller et al. 2023 purposed a minimum dermatologic database consisting of cytology on skin and ears, and

skin scrapings (deep and superficial). It is worth highlighting that biopsy is not considered part of the minimum dermatologic database for this presentation as it is an expensive and often unrewarding test in cAD. If there are financial constraints a therapeutic trial of isoxazoline, instead of the scrapings can be used with recognition that there are rare occasions of failures in this medication treating mites (Miller at al. 2023). Lundberg et al. also proposed several low-cost diagnostics that can be extremely valuable in differentiating and diagnosing canine atopy (see Table 2. Lundberg et al. 2022). For aggressive dogs the use of sedation should be considered as "worth while" part of the physical exam, as it is an important part of ruling in-or-out certain diagnostics (Miller et al. 2023).
In some situations where further diagnostics are not affordable, a tentative diagnosis can be made with a proper history and physical exam alone (Lundberg et al. 2022).

d) Treating pruritis

Once ectoparasites and secondary infections are ruled out, treating the pruritis will be an important step for the relief of the patient as well as the owner, and will likely increase the bond and satisfaction between the owner and the veterinarian (Hanna 2022; Miller et al. 2023; Spitznagel et al. 2019). Common agents to treat allergic pruritis include glucocorticoids, oclacitnib or lokivetmab and/ or topical therapies. There are well documented financial differences between treatments such as glucocorticoids vs oclacinib / lokivetmab that come with increased consequential side effects (Gortel 2018). The "anti-itch" drug choices have been described by some as an "embarrassment of riches" being that there are numerous therapeutic, and deciding which options to pick, at what frequencies, at with what acceptable risks of side-effects can be overwhelming, or tempting to over-prescribe (Gortel 2018, Johnson 2019). Therefore, it is important to understand when and how to use these medications, as well as to understand why these medications might fail. For example, if the secondary infections were not successfully treated (see above), these anti-pruritic may not be effective (Gortel 2018). The other important consideration is that if this is true cAD it will never be cured, and many of the treatment success will be heavily dependent on the owner's ability to provide therapies long-term (Miller 2023). A study by Spitznagel et al. 2019 showed that a caregiver's quality of life is significantly reduced when a pet had uncontrolled skin disease, where owners with successfully treated dermatological pets had the same quality of live ranking as healthy animals. However, another study found that the more complex treatment plans for dermatologic disease also resulted in increased chances of caregiver burnout (Spitznagel et al. 2022). This presents a need for effective treatment for a dermatological patient that is also catered to the client's capabilities to provide that treatment. For example, a topical shampoo applied twice a day can be easily incorporated by some clients, whereas others might prefer an injection every week. These abilities may change over time depending on the client's lifestyle and the GP must be comfortable offering options and creating a space to discuss what is and is not possible. Without owner compliance there is a risk of wasting the clients' funds on therapies not used, failing to provide relief for the animal, and caregiver burnout (can lead to surrendering an animal or euthanasia) (Spitznagel et al. 2019). Some tools clinicians can use to optimize their abilities to approach pruritic treatment and owner education are things like educational videos and hand-outs on therapeutic options and time involved to provide that therapy, offering longer derm appointments for important discussions, and familiarizing the doctors and staff on the up-to-date options of therapeutic efficacy and risks for treating pruritis, particularly for chronic conditions such as cAD (Miller et al. 2022). To successfully treat pruritis a GP needs to have extensive

knowledge on the therapeutics offered, as well as time to discuss the options and develop a treatment plan catered to that patient and owner.

e) Rechecks

Rechecks are an important step following a prescribed therapy and should occur 14 days following initial medications (Miller 2023). Options for rechecks are ideally in person, but if telehealth is an option for a clinic this can provide another option for certain clients (Millet et al. 2023). Introducing these kinds of options, with a reduced cost involved, can help minimize the cost and time required by the owner and allow flexibility for the practitioner (Stull et al. 2018).

f) Diet trials

Once a minimum dermatological database has been collected and secondary infection and ectopic parasites have been ruled out, but the pruritis persists, the two remaining differentials are food allergies or atopic dermatitis. There is currently no accurate test available test for food allergies, aside from a diet trial (Favrot 2010, Miller et al. 2023). Diet trials are costly, extremely demanding of the owner, and of the animal bond. It is often at this point that there is a disruption in the veterinarian-client relationship, for two reasons; 1) general practitioners tend to misdiagnose environmental canine atopy as food allergies (one study reported 46% of the time (Hanna 2022), and/or 2) diet trials are offered in ways that become too difficult to conduct and maintain, leading to shame or frustration of the client. Diet trials require extensive knowledge on diet ingredients and the ever changing research behind canine allergens (Hensel et al. 2024). On average, diet trials take 8 weeks of preventing the dog from eating anything but an often-prescribed diet. This can be an expensive, stressful, timely task. It is recommended that if a diet trial is pursued, a referral to a veterinary dermatologist should be seriously considered (Miller 2023). If these diet trials are not performed correctly the client can easily get frustrated for wasting time, money, and emotional energy. A veterinary dermatologist is often specialized with the skills and information regarding diet trials, therapeutic options and combinations, and price that can take on the client and come to a diagnostic and treatment plan faster (and sometimes cheaper) than an average GP (Hanna 2022). If a referral is not an option, a GP should require 1) time and hand-outs to thoroughly explain the trials, 2) extensive knowledge of diets used during the trials, 3) regular rechecks, history taking, and appointments ideally with the same veterinarian (Miller 2023). It is also important to reiterate that there are trends that can point towards canine atopy vs food allergy but there are no specific tests (i.e. serum tests, saliva tests, hair tests) that can differentiate the two types of allergies (Miller 2023, Favrot et al. 2017).

The role of referrals

Above I have presented areas where dermatological referral is recommended in the literature, however recent research has shown that referral to a dermatologist at any stage, if available, is not wrong. Dermatological referrals are one of the least used of all the specialist referrals, perhaps because of anticipated increased cost to the client (unpublished data Ideaspan Inc. 2016 reported in Hanna 2022). However, a recent survey through the ACVD found that when referred early, dermatological referrals can reduce the cost of work-up and maintain client satisfaction with their referring GP (Hanna 2022). In this survey 73% of clients saw their GP more than 3 times (some more than 5) before they were offered a referral, and of these 38% would not return to their GP for routine medical care (Hanna 2022). The study reported a ‘tipping point’ of more than 3 unsuccessful appointment or spending over $925 where they lost faith in their GP failing to refer them. This is likely because the resources and feasibility of an

average GP resulted in a different diagnosis from the dermatologist 46% of the time (with the 3 top misdiagnoses being food allergy, breed-associated skin conditions, and skin allergies) (Hanna 2022). A cost analysis comparison in this survey also showed that when clients were referred early, veterinary dermatologists were able to address issues in less time than the average GP, where in some cases early referral could have saved 42% of clients at least 25% in costs. Furthermore, 82% of clients said they would have felt better about being referred earlier. In the case of cAD early referral can also be valuable in that it is a chronic disease that will involve long-term treatment. Having a resource that saves money in the diagnostic process and has extensive knowledge in the therapeutic process, can help cater an effective long-term plan for the animal and the owner.

Conclusion

cAD diagnosis is a complicated undertaking that requires an understanding of the presentation of the disease and of the expectations and abilities of the owner. Integrating a SOC approach with simplified research-based algorithms and knowledge on the various options of diagnostics available allows a GP to improve their ability and confidence to work-up a case of cAD. It also allows a clinician to work with the resources available in the clinic as well as the needs of the owner. Finally, a SOC approach also includes the option of referrals that when offered early, can save both costs and time for the client, as well as maintain client satisfaction and trust with their general practitioner. This paper highlights the importance of a SOC diagnostic approach for a dermatological patient that integrates 1) client expectations and abilities with 2) a GP's knowledge, confidence, and ability to either work-up or refer, and 3) fundamentally provide the most successful diagnosis and treatment of complex conditions such as canine atopic dermatitis.

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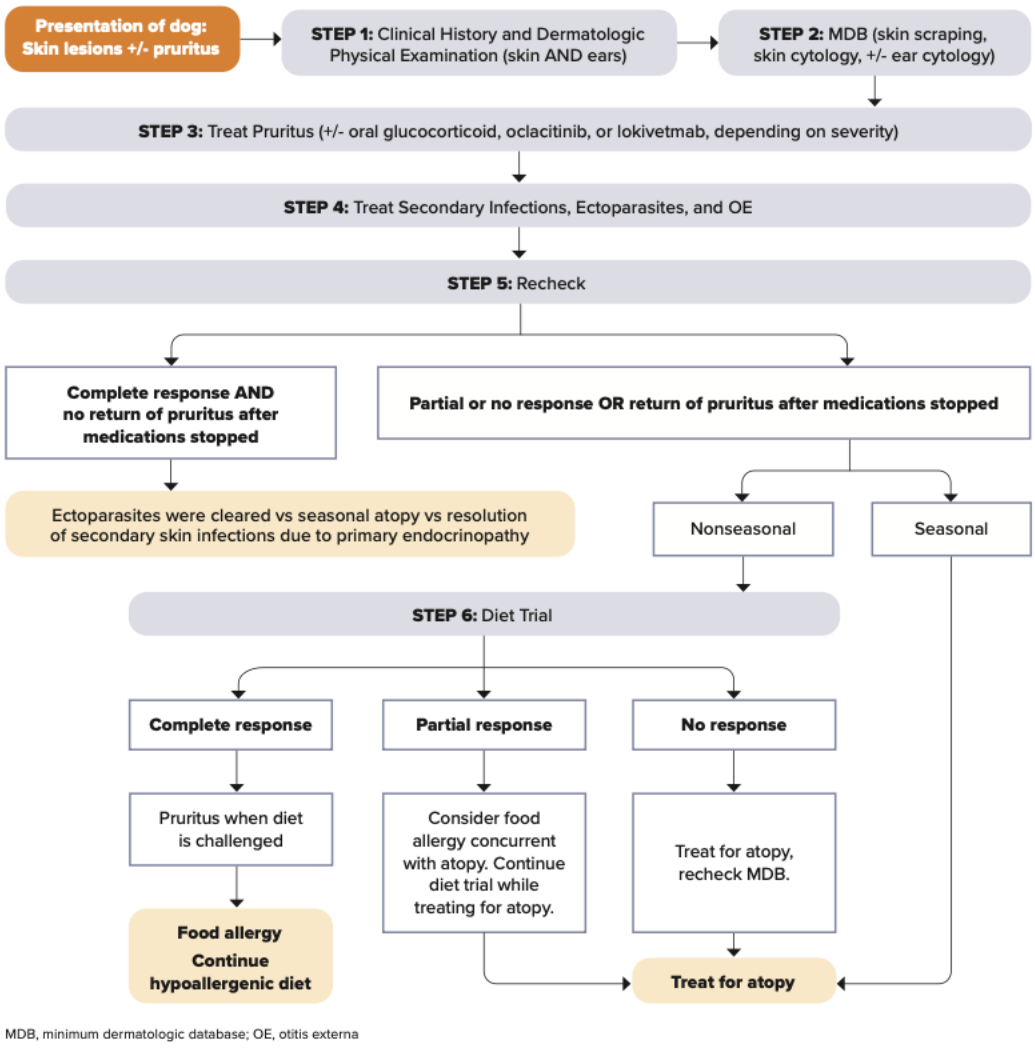
APPENDIX 1

Figure 1: Example of the diagnostic flow of working up a pruritic patient presented by Miller et al. 2023

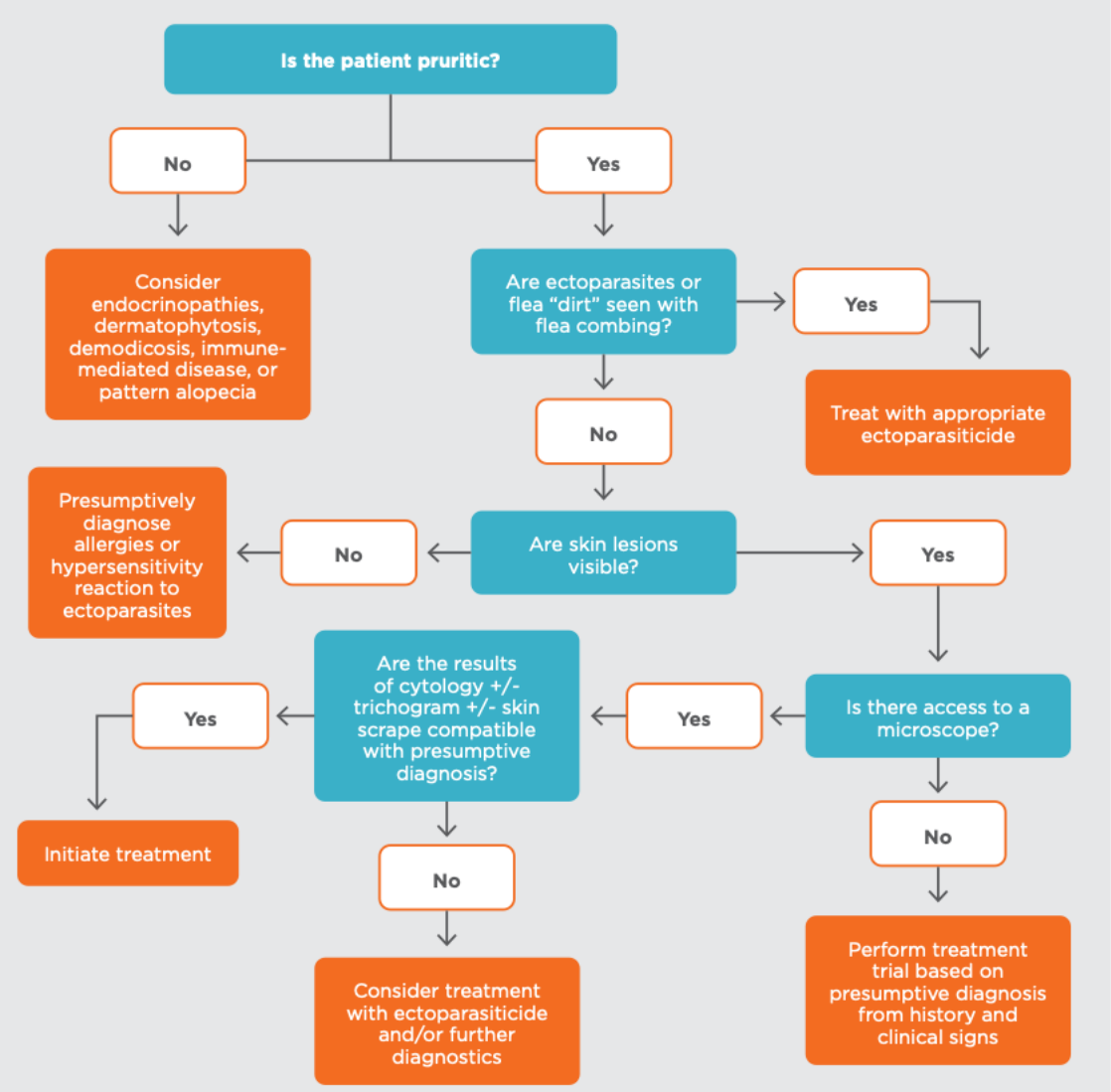


MDB, minimum dermatologic database; OE, otitis externa

FIGURE 1

Diagnosing Allergic Skin Disease in the Canine Patient.

Figure 2. Flow chart for diagnosing common skin conditions of small animal from Lundberg et al. 2022


Is the patient pruritic?
No
Yes
Consider endocrinopathies, dermatophytosis, demodicosis, immune-mediated disease, or pattern alopecia
Are ectoparasites or flea "dirt" seen with flea combing?
Yes
Treat with appropriate ectoparasiticide
No
Are skin lesions visible?
No
Presumptively diagnose allergies or hypersensitivity reaction to ectoparasites
Yes
Is there access to a microscope?
Yes
Are the results of cytology +/- trichogram +/- skin scrape compatible with presumptive diagnosis?
Yes
Initiate treatment
No
Consider treatment with ectoparasiticide and/or further diagnostics
No
Perform treatment trial based on presumptive diagnosis from history and clinical signs