

In animals with recurrent infections, one must consider an underlying allergy as a potential cause.

- Fur mowing: The symmetrical barbering of the fur on belly, flanks, or limbs. Usually, these cats do not traumatize the skin itself.
- Eosinophilic granuloma complex: This category includes eosinophilic (often linear) granulomas, plaques, and indolent ulcers.
- Miliary dermatitis: A term applied to a “cutaneous reaction pattern” that has many possible causes including flea-bite hypersensitivity, ringworm, staphylococcal folliculitis, and allergies. The term describes multiple small crusted papules that spontaneously develop on the skin. These are often felt as the client pets the cat. Early on, without secondary infections or other trauma, these lesions are impossible for the cat to create itself. Cytology (which is often difficult to achieve) often reveals numerous eosinophils.
- Symmetrical pruritus: This is often seen as the cat that creates significant lesions on the face and neck. Secondary infection is common in this form of allergies.
- Atopics usually start off with a seasonal pruritus, but 80% of atopics develop a year round disease. This makes sense since they are pre-programmed to become allergic to their environment.
- Atopy gets worse in time, and dogs/cats do not outgrow their allergies. □□□□□□□□□□
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- Common dog breeds: Labs, Goldens, Pitbulls, Bichons, Shih-Tzus, Jack Russells, Westies, Shar-Peis, Shepherds, Spaniels, etc... And, mongrel dogs too.
- Age of onset: Dogs usually 1-3 years of age. Generally, signs start no later than 6 years old in dogs. Cats can “start” with signs a little later in life-- 1-8 years old.
- Atopics will respond to appropriate steroid dosages (dogs: 1 mg/kg prednisolone daily) if there is not concurrent infection, food allergy, or ectoparasitism (fleas, scabies, cheyletiellosis).
- Atopy is often strongly suggested by a history with a seasonal pruritus. However, it should be a diagnosis of exclusion and we only allergy test once we know the diagnosis of atopy.
- Allergens incite atopic dermatitis transdermally, orally, and maybe via inhalation. The transdermal component is important as dogs and cats live on the ground and do not wear shoes, etc...
- Food allergens are usually proteins or glycoproteins in foods. Common allergens are meats, wheat, corn, soy, dairy. However, theoretically anything ingested can be a food allergen.
- An animal must eat the inciting allergen for some time before developing an allergy. Many clients say “he has eaten the same food for years, he can’t be allergic to it”. This is actually a necessary scenario and dogs/cats can develop food allergens at any point in life for no apparent reason.
- Food allergens must be considered in a year-round itchy dog/cat that develops signs later in life. As previously mentioned, atopy is a genetic condition and the signs start in relatively young adults. Atopy does not start late in life.
- Food allergies may or may not respond to appropriate dosages of steroids. Since

uncomplicated atopy will respond to steroids, we must consider a food allergy in a dog that does not respond.

- **There are no reliable blood tests for food allergies.** Serologic tests looking for IgE against food allergens are inaccurate and even misleading.

- A properly performed home cooked elimination diet trial is the only 100% accurate “test”. These are designed once we know the current or previously eaten ingredients. Food allergics should improve within 4 weeks of removing the inciting ingredient. However, it may take 12 weeks to see maximal benefit since the allergic immune system takes time to normalize.

- Commercially available “novel protein” or “hydrolyzed” (chemically chopped up into smaller pieces) diets have a 10-15% failure rate. This is true even if the bagged diet is chosen based on current/previous ingredients. Ingredients get pretty similar as you look down the list (fish oil, pork fat, etc...).

- Watch out for terms like “animal digest” or “meat-by-product” or “fish-meal.”

- Thankfully, dogs and cats very rarely develop allergies against an effective novel protein diet.

- Shampoos: Appropriate high quality shampoos increase the hydration of the stratum corneum (outer skin layer) and improve the skin barrier. Shampoos are a very effective vehicle for antimicrobial agents. Shampoos can contain anti-pruritic agents (colloidal oatmeal, hydrocortisone, pramoxine, etc...). Shampoos also help remove topical allergens through a simple cleaning action. Shampoos are obviously not a great option for cats.

- Antihistamines (and other nonsteroidal agents): Antihistamines can reduce the action of histamine on a receptor level (H1) and reduce the release the histamine. They are better at preventing pruritus and are not good at removing pruritus. As such, we commonly use steroids to “put out the fire” and then we can see if the antihistamine can keep the animal comfortable. If they help, then they are given routinely at the appropriate dosage interval. Antihistamines can have a steroid sparing effect and they are often used together. Nonsedating antihistamines (Claritin, Seldane, etc...) are not as effective as the sedating types (deiphenhydramine, chlorpheniramine, hydroxyzine, clemastine). Amitriptylline (a Tri-Cyclic Antidepressant) has potent antihistaminic properties, is cheap, administered twice daily, and may help dogs with anxiety. Pentoxifyline (a methylxanthine derivative) works in a different manner but helps up to 30% of atopics. Antihistamines can be very effective in cats.

- Omega Fatty Acids: Certain omega fatty acids can lead to anti-inflammatory prostaglandins and leukotrienes. To achieve this result, the ratio of Omega 6's (e.g. certain vegetable oils) to Omega 3's (e.g. fish oils) is very important and should be between 10:1 or 5:1. Supplements (DermCaps®, etc...) can help to achieve this goal, but it is easier/cheaper to have a diet with the ideal types/quantity/ratio of omega FA's. Eukanuba® dog foods have been studied repeatedly and have consistent and high quality omega FA's.

- Steroids: We use short acting steroids (pred family) when necessary to control itching. Prednisolone is ideal for cats and we often use this over plain prednisone in dogs too. We do not want to use more than 0.5 mg/kg prednisolone every other day long term as it has many side effects (Cushings, elevated liver enzymes, immunosuppression, polyuria/polydipsia). Methylprednisolone is 20% more potent than prednisolone, but has minimal mineralocorticoid properties and is well tolerated by older patients. DepoMedrol (methylprednisolone acetate) is a reasonable option for cats that are difficult to pill. The shots can last over 2 months, but should

not be used as a sole treatment for atopy if more than 2-3 shots are needed annually.

- Cyclosporine (Atopica®): A very expensive option when needed every day (about \$8-9 for the average Labrador!). Perhaps 70% of animals improve when dosed daily. This 70% is not completely “cured” and may only have less erythema or partial improvement in pruritus. If daily therapy works, then we try to go to every other or even every third day. With each drop in frequency, you can expect to lose control in ½ the animals that improved. It is a good option for cats (due to efficacy and cost reasons), BUT... they must be *Toxoplasma gondii* titer negative or they may develop fulminant toxoplasmosis and die.

- What about allergy shots?.... □□□□□□□□
- Allergy testing is available as serologic and intradermal skin test (IDST) options. Both have pro's and con's. (No steroids allowed for either testing scheme. Sedation only needed with IDST. Antihistamines and omega fatty acids ok for serology).
- Serologic allergy testing (VARL, HESKA, Greer) looks at species specific IgE's against environmental allergens. False positives or negatives are possible as blood antibodies may not correlate with the antibodies in the skin. Allergy shots based on serology can work in 2/3 of dogs, and this is about the same success rate as allergy shots based on skin testing.
- IDST should not have false positive results, but can have false negative results. Only well trained/experienced clinicians should perform/interpret IDST.
- Either serology or IDST alone can explain the itching pattern in 75% of cases. We often need to use both tests to best explain an animal's seasonality or lack thereof. ASIT based on both tests combined may have the best results.
- ASIT is giving purified, sterile (but fairly crude) allergen extracts subcutaneously. We are giving way more of an allergen than they would normally encounter, but it is via a different route (SQ). Theoretically, this exposure should drive the Th2 response (hypersensitivity) toward a Th1 response (tolerance).
- Initially, a dilute and small quantity is given, and then shot gradually build up to more concentrated and more volume of shot.
- The most common side effect is increased itching, and this usually indicates that we are giving too much allergen (at least once at a maintenance dosage).
- A common scenario is that the shots provide a palliative effect, but this wears off before the next shot is due. This indicates that the interval may need to be shorter.
- Shots make 1/3 dogs great on shots alone, 1/3 dogs better (still need medicines, but generally need less steroids), and just do not work in 1/3 of dogs.
- It takes a full year to see maximal benefit from the shots.

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NOTE: The hallmarks of allergic dogs are the above signs without primary skin lesions. In other words, by definition, they commonly have an “itch that rashes” and not a “rash that itches”. However, the latter scenario must be ruled out and addressed as skin infections (yeast or bacterial) often exacerbate pruritus.

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CATS: Four common presentations of cat allergies.

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1. What is **atopy**?

Atopy is generally defined as a genetically pre-programmed condition that promotes the development of antibodies (IgE, IgGd) against normally innocuous **environmental allergens** (pollens, dusts, danders, mites), and the subsequent cutaneous signs (redness, itching) upon exposure to those allergens.

IgE, IgGd

T-lymphocytes are essential in the regulation of the immune system. Helper-T cells have different roles and produce different cytokines. Th-1 cells generally promote tolerance, whereas Th-2 cells are thought to promote hypersensitivity reactions (typified by production of IgE). Atopic animals have an imbalance in this system, and this is a hotbed of current research.

T 세포는 Th1, Th2, Treg 등으로 분화한다.
Th1은 IFN- γ , IL-2를 분비하며, 바이러스 감염과 암 퇴치에 관여한다.
Th2는 IL-4, IL-6, IL-10을 분비하며, 알레르기 반응과 자가면역 질환에 관여한다.
Treg은 IL-35를 분비하며, 면역 반응을 억제하여 자가면역 질환을 예방한다.

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2. Food allergies? What's the deal? □□□□? □□□□?

The signs of food allergies or atopy can be very similar. Also, both conditions can be present in probably 10-20% of allergic pets. As such, if an animal has signs of an allergy that is at least partially present at all times of the year, then a food allergy should be ruled out. Food allergies must be considered in an animal that is itchy very young in life (< 4-6 months). This makes sense since the immune system of an atopic takes some time before it can develop an allergy to the environment—at least 6 months, but usually 1-2 years. Young animals often have internal parasites or viral GI diseases that promote a “leaky” gut mucosal barrier.

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Animals with allergies often exhibit signs such as excessive scratching, sneezing, or watery eyes. These symptoms can be managed with various treatments, including antihistamines and corticosteroids. However, it is important to consult a veterinarian for a proper diagnosis and treatment plan.

Animals with allergies may also experience skin irritation, such as redness and swelling. In some cases, allergies can lead to more severe conditions, such as asthma or anaphylaxis. Therefore, it is crucial to monitor your pet's health and seek veterinary advice if you notice any unusual symptoms.

Animals with allergies often have a genetic predisposition. This means that if one or both parents have allergies, their offspring are more likely to develop them as well. Understanding this genetic link can help in early detection and management.

Animals with allergies often have elevated levels of IgE (Immunoglobulin E) in their blood. This is a key indicator used by veterinarians to diagnose allergic reactions.

Animals with allergies often have a 100% response rate to treatment. However, the effectiveness of treatment can vary depending on the severity of the allergy and the individual animal's response. In some cases, treatment may be required for a period of 4 to 12 weeks to see significant improvement.

Animals with allergies often have a 10-15% chance of developing secondary infections. This is because the allergic reaction can weaken the animal's immune system, making it more susceptible to other diseases. Therefore, it is important to monitor for signs of infection and seek veterinary care if necessary.

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3. Atopy Treatment Options: Antihistamines and Corticosteroids

Treating atopic animals often requires a multi-faceted approach. The goal of all therapies is to achieve a level of “tolerable” itch and/or reduce the secondary infections.

Tolerable is a relative term and is different for certain animals and certain clients. A Bichon may have a lower threshold and more severe symptoms than a Labrador. We can remove all pruritus with higher dosages of steroids, but this is not compatible with a long healthy life. If we need to use steroids, we strive to achieve the lowest dose possible on no more than an

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4. Allergy testing and allergen specific immunotherapy (ASIT or “allergy shots”):

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IDST 。

VARL, HESKA, Greer IgE 2/3 。

IDST 。

ASIT IDST 75% ASIT
ASIT

ASIT Th2 Th1

1/3 1/3 1/3

- If shots work, they are given for life.

Our collective goal is to achieve a level of tolerable pruritus, while using little to know steroids. In the allergic pets that we see, we sometimes find the pet needs steroids long term. In this case, we strive to use the lowest dosage possible—meaning the least we need on an alternate day basis to keep them comfortable. -

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