

Question

A 1-year old female stray domestic short hair cat was presented for pruritus. Your physical exam revealed a generalized miliary dermatitis and dark brown flecks in the fur. Which of the following findings are most consistent with the most likely diagnosis?

- Anemia, peripheral eosinophilia, tapeworm infestation
- Mites found on skin scraping, peripheral eosinophilia, and anemia
- Yeast organisms found on impression smear
- Mites found on ear swabbing, peripheral eosinophilia, anemia

Explanation - The correct answer is anemia, peripheral eosinophilia, tapeworm infestation. The cat has flea allergy dermatitis, which often manifests as a miliary dermatitis. Anemia occurs when there is a large burden of fleas feeding on the cat, peripheral eosinophilia is seen with allergies or parasite infestations, and tapeworms are transmitted by the ingestion of fleas carrying tapeworm eggs. The brown flecks in the fur found on physical exam are flea dirt, which are the feces of fleas after ingesting blood. (We know this a somewhat vague question, but we feel you need to get accustomed to these types of questions.

Differential Diagnoses

- Flea allergy is the most common cause of pruritis in cats
- Food allergy and atopy also occur
- Possible pruritic mites include Demodex, Cheyletiella, and Notoedres
- Paraneoplastic pruritus can occur with internal neoplasia
- Dermatophyte infections, autoimmune diseases, and cutaneous lymphoma are not usually pruritic but the can cause alopecia and crust or scale

Diagnostic and Therapeutic Approach

- Tape and/or impression cytology and skin scrapings should be performed to look for secondary bacterial or yeast infections and mites.
 - A dermatophyte culture should be performed since this disease is zoonotic.
 - If cytology and scrapes are negative, then a **strict flea control trial** is needed. To diagnose flea allergy, we recommend giving the Novartis product **Capstar** orally every other day for a month. If there is no improvement with this therapy, then flea allergy is unlikely. To rule out Cheyletiella and Notoedres in conjunction with the flea trial, consider applying the Pfizer product **Revolution** every two week for three treatments.
 - If the strict flea trial fails to improve pruritis, then consider treatment trials for either [food allergy](#) or Demodex. Select the trial based on which approach is easiest for the specific cat and owner. If the first trial fails, then attempt a trial for the next disease.
 - If the patient is an older cat, consider skin biopsies early on to rule out neoplasia.
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Question

A 12-year old male castrated domestic short hair cat presents for further evaluation after developing lesions that have a distribution pattern affecting the dorsal nasal planum, footpads, and ears. Paronychia is also observed in this patient. This cat has an approximate 4 month history of having these lesions and has an intense pruritus. The owner feels the patient is lethargic and has a decreased appetite. A CBC was performed which showed a leukocytosis consisting of a neutrophilia and lymphopenia. The patient also tested negative for FeLV and FIV. If a biopsy was performed and had findings consistent with pemphigus foliaceus, which treatment would you NOT institute?



- Itraconazole
- Prednisone
- Triamcinolone
- Chlorambucil

Explanation - In cats, the most commonly affected area is the head. Specifically, the pinnae, nasal planum, chin, or periocular region are involved. A smaller percentage of cats will also have lesions on their feet. Approximately 90% of cats with pemphigus foliaceus will have lesions in multiple sites, with over 75% having the head or face involved. Over 90% of cases will also have bilaterally symmetrical lesions. Although the condition is **pustular in nature**, these are usually not observed on clinical presentation; instead, crusts are seen as evidence of ruptured pustules. The condition is thought to be immune-mediated in nature with potentially a genetic component. Drug induced pemphigus foliaceus has been reported with the use of itraconazole. Interestingly, there is a case report of ampicillin inducing pemphigus foliaceus in a cat as well. All the other medications have been used for the treatment of this condition. A large retrospective study of 57 cats performed in 2003 documented that patients were more likely to respond with **triamcinolone**, as compared to prednisone or chlorambucil.

Question

A fungal culture from a cat's hair reveals the following finding. How will you treat this cat topically?



- This is an environmental contaminant and does not require treatment
- Hydrocortisone cream
- Lyme sulfur dip
- Ivermectin

Explanation - This is an image of the dermatophyte *Microsporum canis*; one of several organisms that cause ringworm. Approximately 90% of cats affected with a dermatophyte will have *Microsporum canis*. The clinical signs can vary tremendously, however the classic "ringworm" lesion appears as a central/circular region of alopecia with a ring of edema or crusting.

Lyme sulfur dips are very effective at treating dermatophyte infections. You will likely have to do several treatments and also consider systemic therapy. Other topical treatments include miconazole shampoo and enilconazole (currently not available in the United States).

In cats and dogs ivermectin has been used as a microfilaricide, ecto- and endo-parasiticide.

Hydrocortisone cream will not have any effect on dermatophytes and its sole use would potentially predispose the patient to additional secondary complications.

Question

A 4-month old male domestic short hair cat presents for multifocal areas of raised alopecia on its face. You highly suspect that the cat has dermatophytosis, but a Wood's lamp exam shows no fluorescence of the fur or skin. What should you do next?

- Collect samples for fungal cultures
- Send the cat home and have the owner bring it back when the lesion is bigger to re-examine it with the Wood's lamp
- Begin aggressive treatment with ketoconazole

- Take a punch biopsy of the lesion for a diagnosis

Explanation - The correct answer is collect samples for fungal cultures. Fungal culture is the most definitive diagnostic for dermatophytosis. **Ketoconazole** is not recommended in cats because it causes them to vomit (It is also hepatotoxic). Examination of the lesions under a Wood's lamp does not definitively rule out dermatophytosis; only about 50% of *Microsporum canis* organisms actually fluoresce under a Wood's lamp. Other dermatophyte species do not fluoresce at all. A punch biopsy at this point is not indicated yet, since other preliminary tests have not been run.



Question

A 2-year old indoor, vaccinated, spayed female DSH presents with a 6-month history of lesions involving the feet. The owner reports that initially, only the posterior paws were involved but the lesions progressed to involve all four paws. The owner reports the cat did not improve after previous treatment with several antibiotics or a one week course of prednisone at 1 mg/kg.

On examination, you note that all of the metacarpal and metatarsal pads are soft, swollen and discolored as shown in the image. You note that the cat is uncomfortable when walking and occasionally licking the pads; one of the pads is fissured.

Bloodwork reveals a mild monocytosis and mild hyperglobulinemia. Which of the following tests will be most helpful in determining the diagnosis?



- Fungal culture of the lesion
- Serum electrophoresis
- Abdominal ultrasound
- Radiographs of the involved regions
- Biopsy of the pad lesions

Explanation - This is a case of plasma cell pododermatitis which is a relatively **uncommon idiopathic disorder of cats**. While the history and description of the lesions is consistent with this uncommon disorder, other differentials could include pemphigus foliaceus, pemphigus vulgaris, or lupus erythematosus. A chemical or physical trauma could cause lesions such as these but do not fit well with the history. Neoplasia, infection, or sterile pyogranulomas are possible but would be unlikely to affect all paws simultaneously. Eosinophilic granuloma complex is also possible.

Biopsy is likely the only way to differentiate between most of these possibilities. Because plasma cell pododermatitis is rare, it is unlikely that you would be asked about details of this disorder. With plasma cell pododermatitis, you would expect to see **intense plasmacytic infiltration** of the dermal tissue, potentially with other inflammatory cell types present due to secondary infection. The disease is not thought to have an infectious cause at this time. Treatment usually involves long courses (10 weeks) of **Doxycycline**. Approximately, 80% of cats will respond to Doxycycline. If a good response is not seen than systemic glucocorticoids can be tried. Surgical excision of the foot pad may be necessary in cases that fail to respond to medical management.

Question

A 5-year old indoor/outdoor male neutered short hair presents for a wound on the chest. The owner noticed a hole in the skin and thought he had a ruptured abscess. On close examination of the wound, you notice a larva inside the hole. Which organism is most likely under the skin?



- Ancylostoma

- Ctenocephalides
- Culicoides
- Cuterebra

Explanation - Cuterebra is a fly that lays its eggs on soil or plants. The eggs stick to the animal's fur when they come into contact. The eggs hatch, and the larvae either penetrate the skin, are ingested when the animal grooms, or they enter the animal's body through a natural opening, such as the nose.

In most cases, the larvae migrate to areas just under the skin on the head, neck, or trunk of the animal. In dogs, cats, and ferrets, who are not the usual hosts of this parasite, the larvae may also migrate to the brain, eye, eyelids, or throat.

As the larva grows under the skin, it produces a nodule or swelling. A small opening develops in the skin, through which it breathes. A small amount of drainage may occur around this breathing hole.

The treatment is to incise the skin if needed to remove the larva. You have to make sure to remove the larva in whole and not crush it. If it is damaged or crushed, it can cause an anaphylactic reaction.

Ctenocephalides is a flea, Ancylostoma is the hookworm, and Culicoides are tiny gnats that most often bother horses and livestock.

Question

A middle aged MN stray cat is left on the doorstep of your clinic. The cat has a large dry crusted area of alopecia over his nose. A skin scraping of the area is negative. The lesion fluoresces under Wood's lamp examination (see image). Which of the following would be the best treatment?



- Lufenuron
- Full body lyme sulfur dip, itraconazole
- Doxycycline
- Athlete's foot cream (clotrimazole)
- Povidone-iodine scrub

Explanation - This cat has a ringworm infection caused by *Microsporum canis*. This fungi fluoresces blue under a Wood's lamp in 50% of cases.

The best treatment for ringworm infection would include a combination topical and oral therapy. Lyme sulfur dip or an antifungal shampoo containing miconazole would be acceptable. Oral antifungals such as itraconazole or fluconazole are most effective with the least side effects.

Povidone-iodine scrub has not been shown to be effective against ringworm.

Lufenuron is classified as an insect development inhibitor because of its ability to inhibit chitin synthesis, thus in the past has been said to have some effect against fungal infections. This has been debated and not widely supported as a treatment for ringworm.

Doxycycline is an antibiotic and would not be effective in treatment of fungal disease.

Athlete's foot cream (clotrimazole) may have some effect at treating the lesion. Most over-the-counter creams such as this also include a steroid like betamethasone which would not be desired. Although this lesion appears to be localized to the nasal area, ringworm may also be subclinical and this cat may have infection elsewhere in the skin that is not grossly visible. Therefore, the best therapy is a combination of topical and oral.

Question

The 9-month old female spayed DSH cat shown in the photo presents with a wound on the lateral thoracic wall, and she has a matted haircoat. Physical exam is otherwise unremarkable. The owner reported that the wound started as a small swelling that gradually enlarged over the last week. The kitten is not febrile, and the wound is cool and nonpainful upon palpation. You explore the wound and a moving organism is seen in the hole. How was this organism most likely contracted?



- Via entry into a pre-existing wound
- Via cat scratch or bite
- Via ingestion from the environment
- Via ingestion from mother's milk

Explanation - This is an example of *Cuterebra* infestation. Cats are not natural hosts for this parasite, and the larva should be carefully removed. The wound should be enlarged enough to allow the entire larva to be removed without breaking it, because retained parts can cause infections or adverse reactions.

Cuterebra are large bee-like flies that do not bite or feed. They lay their eggs on stones, vegetation, or near the openings of animal burrows. The natural hosts of this organism are rabbits and rodents. Cats and dogs become infested when they come into contact with the larvae on rocks, vegetation, or near the openings of rabbit and rodent dens. The larvae enter the body when ingested or via natural openings. They do not typically enter through the skin. Larvae undergo aberrant migration and localize to the skin of the neck, head, and trunk. *Cuterebra* infestations are seen most commonly in the late summer and fall.

Question

A 1-year-old female indoor cat from Florida was presented for an after-hours emergency examination. Approximately, 72 hours after spending the night locked out on the family's screened-in porch, the cat developed acute severe facial pruritus and was presented for the lesions shown in the image below. Similar lesions were seen on the ear tips and paws; only thinly haired areas with dark hair were affected. The cat was otherwise healthy. Skin scrapings were negative. Impression smears of the nose revealed inflammatory exudates comprised of approximately 75% eosinophils and lesser numbers of neutrophils, lymphocytes, and mast cells.

Which of the following is the best diagnostic or treatment plan?



- Dietary trial with novel protein source
- Institute aggressive flea control
- Bacterial culture of lesions
- Confine the cat indoors for 5-7 days
- Intradermal skin testing for allergens

Explanation - The history, onset, clinical appearance, as well as the cytologic and histologic findings are most consistent with insect bite hypersensitivity. There are other reasonable but less likely differentials including pemphigus foliaceus, food allergy or atopy, and dermatophytosis.

The best way to rule in/out the most likely diagnosis is to confine the cat indoors and see if the lesions resolve as none of the other differentials would be expected to respond. It would be premature to institute skin testing for allergies or a dietary trial for food allergy. Aggressive flea control is not a bad idea, but the lesion distribution is less likely for flea allergy dermatitis. Cats are very sensitive to several pesticides. Bacterial culture would likely result in growth of normal superficial bacteria and not indicate the underlying pathology.

It also may be necessary to initiate an anti-pruritic therapy to reduce further self-trauma by the cat.

Question

You refer a cat with hair loss to the dermatologist and the cat is diagnosed with *Demodex gatoi*. Which is true regarding *Demodex gatoi*?

- It is found mostly in the ear canal
- It is contagious to other cats
- It does not typically cause pruritis
- It is long and slender and lives in the hair follicle

Explanation - *Demodex gatoi* and *Demodex cati* are the two demodex mites seen in cats. *Demodex gatoi* is the more short and stubby mite which lives superficially and *Demodex cati* is the long slender mite which lives in the hair follicles. *Demodex gatoi* is considered contagious to other cats and causes pruritus.

Demodex cati and *Demodex gatoi* are the two *Demodex* mites of cats. (Dogs have only ***Demodex canis*** to address.) *Demodex cati* is long and slender like the "alligator-esque" canine mite and like the canine mite lives inside hair follicles. *Demodex gatoi* is short, stubby with hardly any tail at all, and lives more superficially in the skin. *Demodex cati* is felt to be a normal resident of feline skin while *Demodex gatoi* is more likely an infectious agent.



Demodex cati



Demodex gatoi

Question

A 12-week old female kitten presents to you for head-shaking and scratching her ears. She is one of several kittens in the litter displaying similar signs. On physical exam, there are excoriations around the pinna, and excessive reddish-brown ceruminous discharge in both ears (see image). You clean out the debris from the ear and examine the material under the microscope. On microscopic exam, you see several ear mites, consistent with *Otodectes* infestation. Which of the following treatments is effective against this parasite?



- Milbemycin
- Imidacloprid
- Fluocinolone
- Enrofloxacin
- Praziquantel

Explanation - Ear mite infestation with *Otodectes cynotis* is consistent with the signs described, and the finding of the mites microscopically should have confirmed your clinical suspicion in this case. There are several effective treatments for ear mites, these include:

Milbemycin is the active ingredient in Interceptor and is also available as an otic solution (**Milbemite**). This otic solution is applied directly into the ears and is usually effective in a single treatment although it is sometimes repeated once.

Ivermectin is available as an otic solution (Acarexx). Similar to Milbemite, it is applied directly into the ears and is usually effective in a single treatment although it is sometimes repeated once. Injectable ivermectin is not FDA approved for treatment of ear mites.

Selamectin (Revolution) and moxidectin (Advantage Multi) are approved for control of otodectes but may be more effective as a preventative for ear mites than for immediate treatment of a significant infestation. These formulations are applied topically to the skin between the shoulders.

Thiabendazole, an ingredient in Tresaderm, is effective against yeast and ear mites if used for >10 days.

Question

The patient imaged below has a very rare condition known as Ehlers-Danlos syndrome. What is the primary etiology of this condition?



- Elevated cortisol levels
- Defect in collagen production
- Excessive uric acid deposition between collagen fibrils
- Defect in the stratum corneum

Explanation - Ehlers-Danlos syndrome is a hereditary condition in which a defect in collagen production results in abnormal Type I collagen. This renders the skin very pliable, thin, and susceptible to trauma. Patients with this condition should not be bred. Treatment consists of appropriate housing and lifestyle modifications and prompt treatment of secondary infections. Cats with hyperadrenocorticism may develop a similar skin fragility syndrome, which as the name implies, results in a very thin, easily damaged, friable skin. Uric acid deposition within joints is known as gout. There is no known condition in which deposition in skin associated collagen causes these clinical signs.

Question

A 3-yr-old indoor only spayed female domestic short-haired cat presents with hair loss on the ventral abdomen. Analysis of the hairs shows blunt, "barbered" tips, although no crusts or excoriations are present. Which of the following is the LEAST likely cause?

- Psychogenic alopecia
- Flea allergy dermatitis
- Atopic dermatitis
- Food allergy

Explanation - The "barbered" tips indicate that the cat is excessively grooming her abdomen. Nevertheless, the most likely diagnosis is some type of allergic dermatitis. Psychogenic alopecia is extremely rare in cats and is a diagnosis of exclusion. Allergic dermatitis in cats can present as an apparently non-inflammatory alopecia; the ventral abdomen may be the only site affected.

Question

A 6-year old female spayed indoor only domestic medium hair presents with a large raw lesion on its upper left lip. The owner reports the lesion has come and gone over the past few years. Which of these treatments would likely be most helpful?



- Immunosuppressive therapy and a change to a hypoallergenic diet
- Marginal surgical excision and radiation therapy
- Topical trifluridine and systemic clindamycin
- Wide surgical excision and chemotherapy

Explanation - This cat's image and clinical history of a disappearing and recurring lip ulcer is consistent with an indolent ulcer, part of the eosinophilic granuloma complex. These are mostly found on the upper lip of cats. These lesions can also extend into the oral cavity and can be found at the tongue base or hard palate. Typical treatment involves high doses of corticosteroids and identifying possible underlying allergic disease. Sometimes, antibiotics are indicated if severe infection is present. A hypoallergenic diet can be helpful if food allergy is the cause. Many times, the etiology is unknown but allergy is suspected.

Squamous cell carcinoma is also a differential; however, in a cat that has a lesion that comes and goes, this is much less likely.

Viral infections in cats usually present with upper respiratory and/or ocular signs.

Question

A 6-year old female spayed cat presents for a well circumscribed, raised, yellow-pink linear lesion on the caudal thigh. What is the most likely diagnosis?

- Cutaneous histiocytoma
- Eosinophilic granuloma
- Mast cell tumor
- Deep pyoderma
- Bronchoalveolar carcinoma

Explanation - The correct answer is **eosinophilic granuloma**. Eosinophilic granulomas or linear granulomas are usually linear in shape and pink-yellow in color. Typically, they don't crust and are not usually pruritic. They are thought to be due to **hypersensitivity and allergies to fleas, food, or inhalants**. However, they are often idiopathic. **Treatment is aimed at controlling the hypersensitivity**. Antibiotics and corticosteroids are sometimes used. In cats younger than 1 year many spontaneously regress over 3-5 months.

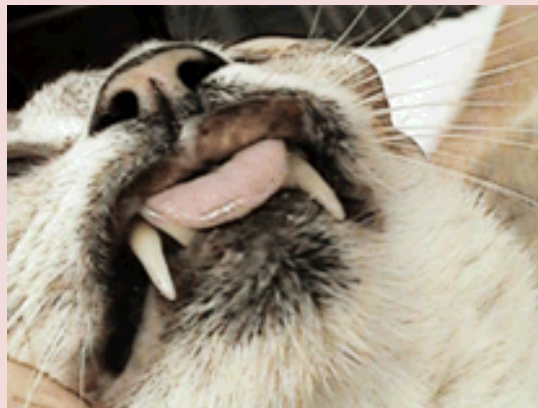
Eosinophilic granuloma complex in cats often is a confusing term for three distinct syndromes that cause inflammation of the skin:

1. **The indolent ulcer**
2. **The eosinophilic plaque**
3. **The eosinophilic granuloma.**

The Indolent Ulcer (also called the rodent ulcer).

Cats with indolent ulcers have erosion on the margin of their upper lip. Sometimes, on the tongue so if your cat has a classical lip ulcer, it is a good idea to open the cat's mouth and check the tongue yourself.

In general, the appearance of the indolent ulcer is classical and a biopsy is not needed, though occasionally these are precancerous conditions and biopsy may be needed to rule out a malignant skin tumor.



The Eosinophilic Plaque

This lesion typically looks like a raised thickened raw area of skin usually on the belly, inner thigh, anal, or throat area. Cats with these lesions are commonly extremely itchy. A microscope slide pressed onto the affected area often picks up **numerous eosinophils** that can be detected under the microscope, thus confirming this condition. Cats with this condition generally have increased circulating eosinophils in their bloodstreams as well.



The Eosinophilic Granuloma (also called the linear granuloma)

The eosinophilic granuloma produces a classical swollen lower lip or chin or a classical long, narrow lesion running down the back of the thigh. Sometimes proliferations grow from the actual footpads where they ulcerate as the cat is forced to walk on them. There is some tendency for this condition to occur in adolescent kittens though it can occur at any age.



Question

You are presented a 6-month male DSH for hypersalivation and tremoring. The owner applied an over the counter topical flea medication this morning when she found 2 fleas on him. She did not bring the box from the flea medication. How should you immediately treat the cat?

- IV dextrose to correct a likely hypoglycemia caused from the medication
- Rinse mouth out, activated charcoal
- Bath to wash off the medication, IV fluids, IV methocarbamol
- Rinse off the topical medication and recommend flea collar only for ectoparasite control in the future
- Warm water enema, IV fluids, IV diazepam

Explanation - This cat is apparently suffering from Pyrethrin toxicity. Many cats are sensitive to flea medications, especially some over the counter varieties. **The medication should be quickly washed off with a bath.** The mouth should also be carefully rinsed depending on the status of the

cat if ingestion is suspected. This often happens with cats that groom then lick the medication from the paws. **IV catheter and fluids should be started immediately.** **Methocarbamol**, a muscle relaxant, is the first best choice to stop the trembling. If this is unsuccessful, **valium** can also be used, and if active seizures are occurring should be given immediately. Phenobarbital or Propofol drip can be given if seizures are refractory.

It is not likely that this medication has caused a hypoglycemia and dextrose is not indicated. A warm water enema would not be helpful as the toxicity is not occurring due to absorption of medication from the cat's colon. Rinsing the mouth and activated charcoal may be indicated, but the initial treatments to stabilize the cat with the bath, fluids, and muscle relaxant are more critical on presentation.

Flea collars are often ineffective and many cats are sensitive to these as well. If the owner would like flea control, a veterinarian prescribed medication would be advised. Good choices for flea control include **feline Frontline** or **Revolution**.

Question

A 3-year old male castrated domestic short hair cat presents for crusting and pruritus around the face, neck, and ears. Which of the following should be least likely on your list of differential diagnoses?

- Dermatophytosis
- Eosinophilic granuloma
- Notoedres acariasis
- Arthropod bite hypersensitivity

Explanation - The correct answer is eosinophilic granuloma. Eosinophilic granulomas or linear granulomas are usually linear in shape and pink-yellow in color. Typically, they don't crust and are not usually pruritic. Notoedres acariasis, insect bite hypersensitivity, and dermatophytosis more characteristically cause pruritis, crusting, and often affect the head, neck, and ears.





Eosinophilic Granuloma Complex

Question

A 6-year old male neutered domestic short hair cat presents with the chin lesion shown in the photo (see image). The lesion is unilateral and nodular with ulceration. What is the most accurate description of this lesion?



- Eosinophilic ulcer
- Miliary dermatitis
- Eosinophilic plaque
- Collagenolytic granuloma

Explanation - The image and description are most consistent with a collagenolytic granuloma. Feline eosinophilic granuloma complex consists of 3 separate clinical syndromes:

1) **The collagenolytic granuloma (also known as eosinophilic granuloma or linear granuloma)** usually occurs on the nose, chin (as in this case), oral cavity, or caudal thighs. The lesions are typically **raised and ulcerative or nodular** as seen here.

2) The eosinophilic plaque occurs most frequently on the abdomen and medial thighs but can appear other places. They appear as single or multiple, raised, red, often ulcerated lesions of varying size (0.5-7 cm). They frequently have a cobblestone appearance and unlike eosinophilic ulcers, these are often pruritic. This condition is histopathologically similar to miliary dermatitis and is usually associated with underlying allergy.

3) The eosinophilic ulcer (also known as indolent ulcer) typically occurs on the upper lip and may be unilateral or bilateral. They often have a characteristic central area of yellow to pink tissue with a slightly raised circumferential edge.

The underlying cause of eosinophilic ulcers and collagenolytic granulomas are unknown, although an underlying allergic cause such as arthropod bites and/or cutaneous hypersensitivity have been suggested.

Treatment of collagenolytic granulomas is also controversial so it is unlikely that you would be asked about treatment of this disorder on a board exam aside from knowing that you should attempt to identify and remove/treat underlying allergy or biting arthropod problems. Some cases respond to antibiotic therapy but most require glucocorticoid therapy.
