

Question

A 4-year old female spayed Siberian Husky presents for further evaluation as a result of developing crusting and hyperkeratosis around the eyes, nose, and mouth. A skin scraping did not identify an etiology. How would you treat this dog?



- Ivermectin treatment
- Corticosteroids
- Daily wiping with chlorhexidine pads
- Zinc supplementation

Explanation - Zinc responsive dermatopathy occurs most frequently in the Siberian Husky. Other species such as cattle, goats, and humans have a similar condition. The exact cause is unknown, but it has been linked to defective intestinal absorption of zinc. Lesions may vary in severity. The response is typically seen within days. The key to answering this question appropriately was to recognize the signalment of the patient, the location of the lesions which is characteristic of zinc responsive dermatopathy, and the fact that there was no infectious etiology such as demodex identified.

Question

A longtime client has come in with a new cat for evaluation of pruritis. The pet was rescued off the streets just a few days ago and now the owner has become slightly itchy. On examination the coat is noted to be dry with small areas of alopecia. The ears and neck region appear to be the most severely affected. The owner is concerned she has become infected with whatever is affecting her new cat. Based on your findings, what will you tell the owner?



- The organism identified is resistant to most insecticides but does respond to ivermectin
- Both you and your cat are likely affected with the same organism and I recommend you seek professional help to help resolve your probable infection
- You will need to treat all dogs and cats within the household
- **From what I have found, the cause of your itchy skin is not associated with your new cat**

Explanation - The image illustrates a louse. Fortunately, lice are host specific and therefore are not considered zoonotic. They spend their entire life-cycle, which is approximately 21 days, on the host. Lice will lay their eggs (nits) on hair shafts which may be identified as white flakes on the hair shafts. There are two types of lice, Anoplura (sucking louse) and Mallophaga (biting louse).

Interestingly, lice are very susceptible to most insecticides (selamectin, ivermectin, imidacloprid, pyrethrin spray, fipronil, lime sulfur dip, etc.) It is recommended that treatment be repeated 10-14 days after the initial treatment to eliminate any nits that may have hatched after the first treatment. Another good idea is to clean any bedding and the environment and treat all animals of the same species in the household.

Question

A 3-year old female spayed Chocolate Labrador presents with pruritus. The owner reports that over the past year and half she has been licking and scratching her ventrum, paws, ears, and face, particularly in the summer. The dog is currently on a good flea control program.

On examination, you find crusted papules, erythema, and alopecia at those sites.

Which of the following interventions will be the most successful treatment for the most likely PRIMARY UNDERLYING ETIOLOGY of the dog's pruritus?

- Hyposensitization injections based on intradermal skin test results
- Oral cephalexin and twice weekly shampoos with a chlorhexadine-containing product
- A strictly controlled diet with a single novel protein and a single novel carbohydrate
- Topical administration of fipronil and S-methoprene

Explanation - Based on the signalment, history, and physical exam findings, you should be most suspicious of atopic dermatitis (atopy).

Atopy can occur in any aged dog but typically begins in dogs between 1 and 3 years of age. It frequently can be seasonal, in contrast to food allergy. Ultimately, atopy is frequently a diagnosis of exclusion made by ruling out flea and food allergy with measures such as strict flea control and an elimination diet. However, enough clues are given here, and the question specifically asks for the treatment for the most likely underlying etiology.

Fipronil (Frontline) and S-methoprene are flea insecticidal therapies. The distribution of the lesions makes flea allergy less likely and additional flea insecticides unwarranted.

Cephalexin and chlorhexadine shampoos are treatments for pyoderma; pyoderma can occur secondary to any allergic skin disease but is not the likely underlying etiology in this case.

Question

A 12-week old pit bull presents for generalized pruritis and thinning of coat for over two weeks (see image). The puppy is the only animal in the house, and is on flea and tick preventative. The puppy has generalized thinning of the coat, scaling, and oily discharge. The puppy is pruritic wherever scratched. The rest of the physical exam is unremarkable. Skin scraping and impression smear shows mites and secondary pyoderma. What is the most common side effect with the treatment of choice?



- Neurological toxicity. It is reversible after stopping medication.
- GI upset; give with food to avoid nausea.
- Increased urination, drinking, and appetite.

- Sedation, taper dose if necessary.

Explanation - Ivermectin orally is the treatment of choice due to good oral bioavailability, effectiveness, and ease of use. Starting dogs on low dose (0.1mg/kg) of ivermectin and gradually increasing dose to therapeutic levels (0.6mg/kg) is recommended over 5 days to monitor for signs of neurotoxicity. Signs include ataxia, head tilt, and lethargy. Signs typically resolve within 24-48hours after stopping ivermectin when seen. Worst-case scenarios are those with collie breeds or other dog breeds that have the MDR-1 gene. This leads to toxic accumulation of drugs intracellularly, leading to severe neurological signs including comas and possibly death.

Question

You diagnose generalized demodicosis in a 3-year old mixed breed dog. What should be your next step of action?

- Warn the owners of the zoonotic potential of Demodex
- Treat with antifungals
- Further diagnostics to search for an underlying systemic disease
- Euthanize the dog since it is unlikely to get better even with treatment

Explanation - The correct answer is further diagnostics to search for an underlying systemic disease. Adult dogs that develop generalized demodicosis usually have an underlying systemic disease that compromises their immune system and predisposes them to such infections. Often times these dogs may be on long courses of steroids.

Keep in mind that although generalized demodicosis starts in puppyhood (3-18 months) if it's not adequately treated the patient can carry the disease into adulthood. So it is not uncommon to make the diagnosis (with no underlying cause) at 2-5 years of age.

Euthanasia is premature here since an underlying disease has not been identified yet. Demodex is host-specific and is not considered to be zoonotic. There is no indication to treat with antifungals at this point since a yeast infection has not been identified.

Question

A 14-year old Husky presents for the signs seen here (see image). What do you tell the owner regarding prognosis?



- Permanent discoloration will spread over entire body
- This will reverse after treatment
- Color changes may occur seasonally
- May ulcerate, immunotherapies needed

Explanation - This is seasonal nasal hypopigmentation. Season associated lightening of the nasal planum occurs during winter months and can darken in the spring and summer. Complete depigmentation is not noted. Hypopigmentation and discoloration of the nose and mucocutaneous junctions can vary from benign immune-mediated diseases, such as vitiligo that lower the amount of melanocytes in the skin to seasonal variations in coloring, commonly called a "Dudley Nose" or "Snow Nose". Certain breeds are more predisposed than others, such as Siberian Huskies, Golden and Labrador Retrievers, and Bernese Mountain Dogs. This can be seen in any breed.

With vitiligo, which is a benign immune related depigmentation, antimelanocyte antibodies can be found in circulation and a biopsy will show decreased melanocytes. Typically multiple areas will be affected, including ear tips, footpads, claws, and hair coat. Breeds predisposed to vitiligo can include German Shepherd Dogs, Collies, Rottweilers, Doberman Pinschers, and Giant Schnauzers

There are no treatments to prevent these disorders, and they typically cause no harm to the animals.

Question

Which of these drugs is known to cause significant release of histamine?

- Acepromazine

- Ketamine
- Morphine
- Butorphanol

Explanation - The correct answer is morphine. Morphine should probably not be used in patients with mast cell tumors for this reason. Butorphanol causes no increase in histamine even though it is also an opioid. Acepromazine actually has some antihistamine effect. Ketamine does not affect histamine₀ levels.

Question

A 4-year-old spayed female German Shepard is seen for aggressive chewing and licking at her back legs. After the matted coat is shaved and removed you see the lesions affecting her skin, most severe on her left leg (see image). What is least likely to be beneficial?



- Antifungals
- Steroids
- Chlorhexidine shampoo
- Removing superficial crusts
- Antimicrobials

Explanation - Deep pyoderma can be secondary to allergies, skin fold anomalies, endocrine disorders (Hypothyroidism and Cushing's), immune mediated skin diseases, bacterial and/or fungal skin infections, or migrating foreign bodies. Determining the underlying etiology will help with resolution and minimize chance for treatment failures and re-occurrence.

Diagnostics should include skin scraping and impressions, culturing for bacteria and fungi, biopsy,

and blood work. Treatments typically include antimicrobials that have demonstrated susceptibility, antifungals if needed, and frequent topical treatments with chlorhexidine shampoo and removal of the dead tissue and debris. **Steroids are contraindicated as they will encourage antimicrobial resistance and suppress the immune system.**

Incidentally German Shepherds are a breed that is predisposed to severe deep pyodermas that can be difficult to treat. Discussing this with your client will help give them realistic expectations for treatment.

Question

A 3-month-old pit bull terrier presents with generalized alopecia and crusting of the skin (see image). A deep skin scraping shows the dog has generalized demodicosis. What should you tell the owners?



- Generalized Demodex infections usually resolve on their own without treatment.
- Transmission of the infection was from the bitch to the puppy. The bitch should be treated for Demodex because she is the source of the infection. The puppy does not need to be treated.
- It is very common for pit bull puppies to get generalized Demodex infections. The puppy should be treated for the infection but the prognosis is good.
- The dog likely has an inherited defect in cellular immunity. The dog should not be bred.

Explanation - The correct answer is the dog likely has an inherited defect in cellular immunity. The dog should not be bred. Generalized demodicosis in juveniles and puppies is usually caused by an inherited defect in cell immunity. They should be treated with a mite killing agent like

ivermectin, amitraz, or milbemycin, as well as with oral antibiotics for secondary bacterial infections. Spontaneous remission of the infection can occur, but the prognosis is always guarded. Demodex mites are part of the natural flora of a dog's skin, so they are normally present all the time. Adult dogs that develop generalized demodicosis are usually immune-suppressed.

Question

A 3-month old stray mixed breed puppy is presented for patchy areas of alopecia, crusting, erythema, scaling, and severe pruritus around his pinnae, ventral thorax, ventral abdomen, and legs. You highly suspect scabies acariasis, but your skin scraping is negative. What should you tell the owner?

- The puppy does not have a mite infestation since the skin scraping is negative.
- The puppy most likely has a scabies infestation, but the mite is very species specific and has no zoonotic potential. Precautions do not need to be taken when handling the dog.
- The puppy most likely has a contagious mite infestation and euthanasia should be considered because a genetic defect in the immune system is what leads to such a severe infestation. The puppy will not get better even with treatment.
- The puppy likely has canine scabies, which is zoonotic. Contact with the puppy should be limited and gloves should be worn when handling the dog.

Explanation - The correct answer is the puppy likely has canine scabies which is zoonotic. Contact with the puppy should be limited and gloves should be worn when handling the dog. It is not uncommon for skin scrapings of a scabies patient to be negative for the mite.

The signalment, lesion distribution, and clinical impression are sufficient for diagnosing a scabies infestation. Scabies infections are not associated with a genetic defect and are usually responsive to treatment with agents like ivermectin, amitraz, milbemycin oxime, or selamectin.

Although the mites are fairly host-specific, they are still considered zoonotic and precautions should be taken when handling the animal.

Question

A 7-year old German Shepherd dog presents for a second opinion of bilateral distal forelimb wounds. The owners note that they are not excessively pruritic but the patient will lick at the region. A biopsy had previously been performed with a microscopic description of chronic focal nodular pyogranulomatous dermatitis and destructive furunculosis without evidence of neoplasia or underlying etiology. In light of these findings, acral lick dermatitis is suspected. Which of the following is NOT a reasonable treatment strategy?



- Ivermectin and prednisone therapy
- Fluoxetine
- Basket muzzle or E-collar
- Combined systemic triamcinalone and clindamycin therapy

Explanation - Acral lick dermatitis is considered a chronic and repetitive condition in which a dog continuously traumatizes a region as a result of obsessive licking. The licking is usually secondary to pruritis from allergies and will lead to infection. There could be multiple causes for this such as a neuropathy or underlying orthopedic disease; however, this behavior is considered to be obsessive-compulsive, and the patient may need to be evaluated for other anxiety related behaviors.

Since these lesions are not parasitic in origin the answer choice with Ivermectin is considered the poorest treatment option. All other choices may be used alone or in combination to help break the cycle and achieve healing of the lesion. Triamcinalone is a steroid. Clindamycin is an antibiotic. Fluoxetine (aka Prozac) is used to treat depression and obsessive-compulsive disorders. Basket muzzles and e-collars are commonly used as well to help stop the licking.

Question

Which of the following breeds is predisposed to canine familial dermatomyositis?

- Doberman
- Golden Retrievers

- Collies
- Siberian Huskies

Explanation - The correct answer is collies. Collies and Shetland Sheepdogs are predisposed to canine familial dermatomyositis. The disease causes atrophy of muscles and erosion, crusting, and alopecia of skin, which is exacerbated by heat and sun exposure. Treatment is often unrewarding and includes high doses of corticosteroids, vitamin E, and omega-3 fatty acids.

Dermatomyositis is an inherited disorder that can cause skin lesions and in severe cases, affect the muscles of shelties and collies. DM primarily affects Collies and Shetland Sheepdogs, although is seen occasionally in other breeds. DM will usually begin on the head and ears and the front legs. Dm outbreaks can be quite mild or very severe.



Question

Which of the following clinical signs is not consistent with discoid lupus erythematosis in dogs?

- Loss of "cobblestone" appearance of the nasal planum
- Alopecia and crusting around the muzzle, lips, and periorbitally
- Hyperpigmentation of the ventral abdomen
- Depigmentation of the nasal planum

Explanation - The correct answer is hyperpigmentation of the ventral abdomen. Clinical signs consistent with DLE include depigmentation, erythema, scaling, and loss of the "cobblestone" appearance of the nasal planum. Alopecia, crusting, scaling, and ulcerations can also be seen on the face, muzzle, lips, pinnae, and periorbitally.

Question

Which of the following parasites that can be found on dogs is not contagious?

- Otodectes
- Sarcoptes

- Cheyletiella
- Demodex

Explanation - The correct answer is Demodex. Demodex is a normal inhabitant of the skin and causes disease when there is either a genetic predisposition or systemic disease that allows Demodex to proliferate, resulting in skin pathology. Therefore it is not contagious in dogs. Demodex gatoi in cats is thought to be contagious amongst cats.

Question

A 2 year old male castrated Husky presents for crusting and hyperkeratosis of the mucocutaneous junctions and extremities. What heritable disease is the most likely cause?

- Lupoid dermatosis
- Color dilution alopecia
- Zinc responsive dermatosis
- Familial dermatomyositis

Explanation - The correct answer is zinc responsive dermatosis. This disease commonly affects Huskies, Malamutes, and German Shorthaired Pointers. The defect causes an increased requirement for zinc. Clinical signs are usually responsive to oral supplementation with zinc.

Familial dermatomyositis is an inflammatory disease of the skin and muscles of Collies and Shetland Sheepdogs. Lupoid dermatosis is a fatal disease that initially causes crusting and scaling of the dorsum and head in young German Shorthaired Pointers. Color dilution alopecia is a heritable alopecia that develops in animals with less melanin in their hair shafts than normal; one example would be a fawn colored Doberman Pinscher.

Question

A 1-year old female spayed Pit Bull presents for a focal area of alopecia that is well circumscribed, erythematous, and scaling. A deep skin scraping reveals Demodex mites. Which of the following is true regarding treatment for demodicosis?

- Shampoos containing benzoyl peroxide should not be used in this patient.
- Treatment of localized Demodex in young dogs is usually unnecessary. It usually clears up on its own.
- The dog should be separated from people and treated aggressively with topical agents like Goodwinol (rotenone) because the disease is zoonotic.
- Ivermectin should be used in all patients with demodicosis.

Explanation - The correct answer is treatment of localized Demodex in young dogs is usually unnecessary. It usually clears up on its own. Ivermectin is usually used to treat generalized

Demodex and should not be used in heartworm positive animals and herding dogs like collies and Shepherds (remember that Ivermectin also kills turtles!). Benzoyl peroxide shampoos should be used with demodicosis patients. Although, benzoyl peroxide cannot directly kill the mite it aids in follicular flushing. Demodex is a species-specific mite and is not considered zoonotic. Goodwinol is a topical agent sometimes used for localized demodicosis.

Question

A chocolate lab presents for routine wellness examination and vaccinations. Your only abnormal finding on physical examination is seen here (see image). What treatment would you NOT recommend?

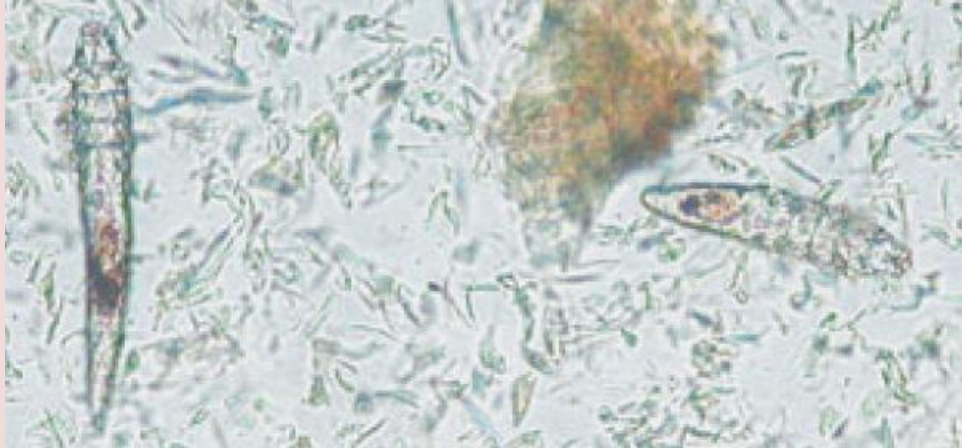


- Manual removal
- Pour on
- Burn off
- Dips

Explanation - Burning may cause the ticks to become agitated and regurgitate their stomach contents into the surrounding tissues they are feeding from. This will cause severe inflammation and pruritis, and can also lead to tick borne diseases. Burning can also harm the patient. The correct way to remove ticks is to grasp them with forceps just behind their heads and gently apply traction until they release. Twisting will cause the heads to stay lodged under the skin. For large numbers or ticks, as seen in this image, **Fipronil pour-ons** and **Permethrin topicals** can be used to kill off the ticks. Periodic pour-ons and bathing routinely can also be used in the face of severe infestations.

Question

A 2-year old female spayed Leonberger presents to you with hair loss around the face and eyes. A deep skin scraping is shown in the picture below. What is your diagnosis?



- Otodectes
- Staphylococcus
- Sarcoptes
- Demodex
- Fungal pyoderma

Explanation - The cigar shaped mites in the image are recognizable as Demodex mites. If you were particularly observant, you would have noticed that there are two different species of Demodex mites here. The longer mite is the typical follicular mite, *Demodex canis*. The shorter mite is a more superficial Demodex mite that is similar to the feline demodex mite, *Demodex gatoi* and may be somewhat contagious.

Question

A 2-year old Siberian Husky presents for crusting and scaling of his foot pads, periorbitally, and along his mucocutaneous junctions. Based on the breed and clinical signs, which supplement should be added to this dog's diet?

- Zinc
- Calcium
- Copper
- Vitamin E

Explanation - The correct answer is zinc. Huskies are predisposed to zinc-responsive dermatosis in which individuals have a higher requirement for zinc in their diets due to a defect in absorption of the element. Clinical signs include crusting and scaling of foot pads, elbows, eyes, and mucocutaneous junctions.



Question

An 8-year old mixed breed male neutered dog presents with a several-month history of lethargy, hair loss, and greasy skin. The patient's face, feet, and tail are not clinically affected and he is not pruritic. What is the most likely cause of the hair loss?



- Flea allergy
- Sarcoptes
- Malignant melanoma
- Endocrinopathy

Explanation - The lesion distribution is most consistent with endocrinopathy; flea allergy and sarcoptic mange would be extremely pruritic in a patient with these lesions. The dark coloration,

although alarming to clients, reflects hyperpigmentation associated with inflammation, not neoplasia.

Question

A two-year old Dachshund presents for hair loss (see image). He is not pruritic. Both ears are affected. No other hair loss is noted over the rest of his body. His physical exam is unremarkable. In house skin scrapings are negative for mites. Blood work and thyroid levels are unremarkable. What is the most likely cause?



- Bacterial infection
- Endocrine disorder
- Mite infection
- Breed related
- Immune-mediated

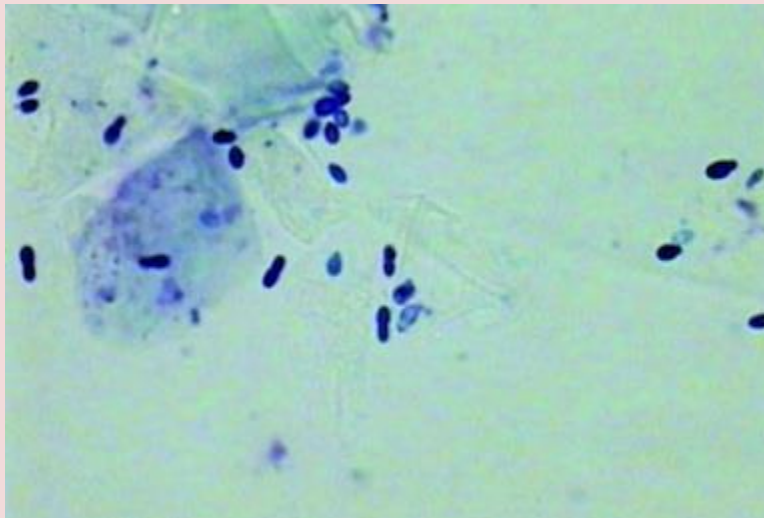
Explanation - Canine pinnal alopecia is a form of pattern alopecia. Pinnal alopecia is most commonly diagnosed in Dachshunds, but can be seen in Chihuahuas, Boston Terriers, Bull Terriers, Yorkshire Terriers, and Italian Greyhounds. The condition usually occurs in dogs older than 1 year of age and results in slowly, progressive, bilateral pinnal alopecia. The ear margins may become chronically hyperpigmented and thickened. The condition is benign and requires no specific treatment.

Distribution of the alopecia is an important key to determining the underlying diagnosis. It may help in distinguishing inflammatory from non-inflammatory causes, thus narrowing down your

differential list. Inflammation results in a patchy pattern of alopecia that is not symmetrically distributed; whereas, many of the noninflammatory alopecias have a symmetrical pattern of alopecia. Hypothyroidism often causes alopecia of the tail and may also be associated with alopecia of the nose bridge. Hair loss begins with the pinna at 6 to 9 months of age and may progress to complete pinnal alopecia. Total body alopecia with pigmentation may occur with age. Treatment with oral melatonin may cause hair regrowth with this and other pattern baldness syndromes. Other medications that can be used with variable success are pentoxifylline and Omega 3 oils topically.

Question

A four-year old Labrador Retriever presents with an aural hematoma of the right ear. Given the cytological findings from an ear swab as seen in this image, which one of the following ear cleaning combinations will you not send home with your patient?



- Thiabendazole, neomycin, and dexamethasone
- Neomycin, bacitracin, and polymyxin B
- mometasone, gentamicin, clotrimazole
- Gentamicin, betamethasone valerate, and clotrimazole

Explanation - This patient has a high number of malassezia yeast visualized on cytology. This organism can be responsible for perpetuating otitis externa. It is not unusual to see yeast in the ear canal of a dog; however, yeast numbers of greater than 5 per high powered field can be considered abnormal.

Other clinical signs of otitis externa may include ear pain, pruritis, aural discharge, bad odor, and neurologic signs.

Effective treatments for uncomplicated otitis externa typically contain an antifungal, antibiotic, and an anti-inflammatory. Since this dog primarily has a yeast infection it is imperative that the ear

medication prescribed has an anti-fungal. The answer choices provided are commonly known as triple antibiotic ointment (neomycin, bacitracin, and polymyxin B), Tresaderm (thiabendazole, neomycin, and dexamethasone), Mometamax (mometasone, gentamicin, clotrimazole), and Otomax (gentamicin, betamethasone valerate, and clotrimazole). Note that the triple antibiotic ointment does not contain an anti-fungal.

Additionally, the ears should be cleaned before applying the ear medication. Many ear cleaners contain antifungals too (Triz Ultra + Ketoconazole), which may enhance treatment response.

Question

A 5-month old intact female mixed breed presents to your hospital for the progressive lesions seen on the image provided. The owner described the lesions as initially being papules and vesicles which eventually ruptured. Recently, the owner has also noticed that the muscles of the face appear to be atrophied. Muscle and skin biopsies were performed which came back supportive of a diagnosis of dermatomyositis. Which of the following medications is not useful for the treatment of this condition?



- Prednisone
- Hycodan
- Cyclosporine
- Pentoxifylline

Explanation - Dermatomyositis is a relatively unusual condition that results in skin lesions as well as myositis. The skin lesions initially appear as papules and vesicles which then rupture, ulcerate, and may progress to crusty alopecic lesions. The myositis sets in a little later and atrophy of the temporalis muscle is often seen. In more severe cases the muscles of the distal extremities become involved and megaesophagus may be observed. Since muscle changes usually lag, other diagnostic tests such as a skin scraping and cytology are performed first to rule out other common conditions. The condition has a variable prognosis as the clinical signs may wax and wane. Medical management usually consists of pentoxifylline, prednisone, and cyclosporine. Prednisone and cyclosporine serve as immunomodulatory medications. Pentoxifylline is used to help improve bloodflow. Hycodan contains hydrocodone and is used as a cough suppressant.

Question

What medication should be avoided in this patient diagnosed with Demodex, and why?



- Ivermectin, possible p-glycoprotein pump mutation
- Cephalexin, antibiotics are not required in this patient
- Prednisone, it causes immune suppression
- Chlorhexidine, risk of toxicity through percutaneous absorption

Explanation - Demodicosis occurs in juvenile patients whose immune systems are insufficiently developed to control the mites, or in older patients with an underlying condition that has suppressed their immune system. Even though the condition is primarily caused by demodex there may be a secondary, opportunistic, bacterial infection making cephalexin a possible adjunct to treatment.

Toxicity as a result of using chlorhexadine is highly unlikely. Glucocorticoids are contraindicated as they further suppress immunity. Ivermectin is contraindicated in collies and related breeds.

Question

A 9-year old female spayed Chihuahua presents to you with the skin abnormality shown below. She has similar lesions all over the rest of her body. A superficial and deep skin scraping show many moving "cigar shaped" mites. Which of these products is the only FDA approved for treatment of this disease?



- Chlorhexadine
- Amitraz (Mitaban)
- Lime Sulfur
- Ivermectin (Ivomec)
- Milbemycin (Interceptor)

Explanation - The correct answer is amitraz (Mitaban). This is a case of generalized demodicosis which can occur in older dogs as well as young dogs. It is caused by the commensal mite, *Demodex canis*, and is often secondary to an underlying disease or immunosuppression. There are several treatment options (and you should probably know them all) but the only FDA-approved treatment is Amitraz (Mitaban). Ivermectin and milbemycin are also used to treat this condition in part because it is difficult to obtain Mitaban. Mitaban is used as dip and should be administered in a hospital, which is time consuming when there are other treatment options that can be similarly effective although used "off-label". Mitaban should be used cautiously in animals with skin lesions since more systemic absorption of Mitaban will occur which increases the likelihood of toxic effects.

Question

The stray dog in the photo comes into your clinic with the lesions shown. A deep skin scraping confirms a diagnosis of Demodex. Which of the following statements about Demodectic mange is true?



- Demodex most commonly affects the neck and dorsal trunk of dogs
- The diagnosis of demodectic mange is performed by a superficial skin scraping
- Demodex mites are commensal organisms that can be found in skin without clinical signs
- Focal demodex infections must be treated quickly, or they will spread and become more severe

Explanation - The correct answer is demodex mites are commensal organisms that can be found in skin without clinical signs. Focal demodex lesions will usually resolve spontaneously without any treatment. Demodex are found down at the hair follicle, so diagnosis is made by a deep skin scraping. The most commonly affected areas on a dog include the face, muzzle, periorbital region, and thoracic limbs.

Question

The 3-year old English Setter in the photos presents to you with severe pruritus affecting the face, axillary, and inguinal regions as well as the dorsal aspect of the paws. After a careful history and physical examination, you suspect the dog has atopy. What type of hypersensitivity (HPS) and what class of immunoglobulin are MOST IMPORTANT in the pathogenesis of atopic dermatitis in dogs?



- Type I HPS, IgE
- Type I HPS, IgA
- Type IV HPS, IgE
- Type IV HPS, IgA

Explanation - Atopic dermatitis is mediated primarily by IgE and is considered a Type I, or immediate, hypersensitivity reaction. In some species, IgG may also play a role.

It is interesting to note that not all atopic patients present with a typical Type 1 hypersensitivity. Some patients with atopic dermatitis do not have measurable IgE against environmental allergens. This syndrome is termed "atopic-like."

Allergy	Atopy	Food Allegy	Flea Allergy	Contact Allergy
Hypersensitivity type	Type I Immediate H	Type I & IV Immediate and Delayed H	Type I & IV Immediate and Delayed H	Type IV Delayed H

Question

The patient imaged below is a 5 year-old male castrated dog that has been afflicted with pemphigus vulgaris. The patient's lesions are located at the mucocutaneous junctions including the prepuce, anus, and gingiva. Given the likely treatment regimen of this patient, which of the following medications would you not prescribe?



- Firocoxib
- Maropitant
- Fluconazole
- Enrofloxacin

Explanation - Pemphigus vulgaris is an auto-immune disease which requires immunosuppressive therapy. This patient is likely on a steroid and possibly other immunosuppressives. Firocoxib (Previcox) is a nonsteroidal anti-inflammatory (NSAID) with specific inhibition at the Cox-2 sites and sparing of Cox-1 receptors. As with any NSAID, it is contraindicated to give this medication in conjunction with a steroid due to the high likelihood of side effects. Combination of an NSAID with a steroid may result in renal compromise and failure, in addition to gastric ulceration and increased risk of gastrointestinal perforation.

The other medications listed have no known adverse side effect when given with a steroid. Enrofloxacin has been known to cause blindness in cats at high doses. Maropitant is a popular anti-emetic/anti-nausea medication used in small animals. This medication has the potential of accumulating, therefore a washout period is recommended if used for more than 5 days. Fluconazole is a fungistatic triazole. It has the potential for hepatotoxicity and therefore patients on this medication should have their liver parameters periodically evaluated.

Question

A 1-year-old male castrated Boxer presents to you for lesions on the chin seen in the image. The chin is mildly painful to the touch, and small papules are present. Biopsy of the area confirms folliculitis and furunculosis. Which of the following treatments should be recommended?



- Recommend switching to plastic food and water bowls since some dogs can have reactions to certain metals
- Clean the area frequently with benzoyl peroxide shampoo or gel
- Instruct the owner to express the papules to decrease the bacterial load
- Prednisone

Explanation - Chin acne is a chronic inflammatory disorder of young short coated animals. It is characterized by folliculitis and furunculosis. Secondary bacterial infections can develop if it becomes more advanced. There has been some association seen after contact with plastic water and food bowls, and switching to a different material may help; however, the evidence is more anecdotal and is extrapolated from studies in humans and cats. The chin and lips should be kept as clean as possible with frequent bathing and antibiotic ointment to prevent plugging of the follicles.

Some cases can be simply managed by modifying behaviors that can traumatize the chin (chasing balls) and topical antibiotics. Severe cases will need long courses of systemic antibiotics to resolve the infection and then topical corticosteroids to prevent new lesions. The papules should not be expressed, as this can increase inflammation.

Benzoyl peroxide is good choice for a topical antibiotic since it has follicular flushing action. Keep in mind that topical application of benzoyl peroxide can be irritating to the skin if overused.

Question

A 1-year old mixed breed stray dog is presented for extreme pruritis and the lesion shown in the picture. The dog was recently found and adopted off the street and has been itching despite being bathed and treated with flea preventatives. The owner reports that she has been itching and developing rashes on her own body since adopting this dog. Your physical exam shows that the dog has several additional similar lesions on the other legs, chest, and ventral abdomen. What is the most likely diagnosis?



- Cutaneous lymphoma
- Sarcoptes infestation
- Squamous cell carcinoma
- Demodex infection

Explanation - The key to this question is that Sarcoptic mange is extremely pruritic and can be transmitted to people, including this dog's owner. Diagnosis of this disease is usually based on clinical impression and potential for exposure to the mites. A positive skin scraping would be most definitive, but scrapes often come back negative and trial therapy would need to be instituted.

Demodex is not transmittable to people and does not typically cause extreme pruritus like Sarcoptes.

Lymphoma and squamous cell carcinoma are less likely because they typically would occur in older animals and neither are usually particularly itchy.

Question

A 16-week old male Labrador Retriever presented to your hospital with an acute onset of pustular lesions and lethargy. The patient does not have a recent history of being vaccinated. On physical exam, the patient has generalized lymphadenopathy and a fever of 104.2. The lesions are only associated with the face. Based on the available information, what is your likely diagnosis and treatment of choice?



- Flea allergy and selamectin
- Bacterial pyoderma and broad spectrum antibiotics
- Puppy strangles (canine juvenile cellulitis) and prednisone
- Demodicosis and ivermectin

Explanation - The age of the patient, along with the generalized lymphadenopathy and fever, are classic for puppy strangles when combined with the pustular skin lesions observed. Typically, dogs will be affected around the muzzle, pinnae, and eyes. Important differentials include allergic drug reactions, demodex, and bacterial pyoderma. A skin scraping would be very useful to rule out demodex. However, the fact that the patient has generalized lymphadenopathy and a fever should help you deduce that this is more likely to be puppy strangles. Antibiotic therapy may be administered concurrently to eliminate any secondary bacterial pyoderma.

The cause of puppy strangles is unknown but thought to be immune-mediated. It will generally resolve with glucocorticoid therapy. Labradors, Golden Retrievers, Beagles, Dachshunds, and Pointer breeds may be predisposed. Affected animals will often times be febrile, anorexic, and lethargic. The pustules will eventually rupture, drain, and cause cellulitis.

Question

A 3-year old female Wirehaired Fox Terrier comes to you with the presenting complaint of pruritus. The owner reports that in the past 1-2 weeks, the dog has begun scratching constantly and that she never previously had this problem.

On examination, you find crusted papules, erythema, alopecia, and excoriations distributed primarily around the caudal half of the dog. The changes are fairly bilaterally symmetric and are most prominent at the dorsal lumbosacral region, tailbase, perineum, and medial thighs.

Which of the following interventions will be the most successful treatment for the most likely PRIMARY UNDERLYING ETIOLOGY of the dog's pruritus?

- Oral cephalexin and twice weekly shampoos with a chlorhexadine containing product

- Hyposensitization injections based on intradermal skin test results
- Oral cyclosporine and twice weekly shampoos with a benzoyl peroxide-containing product
- Topical administration of imidacloprid and permethrin
- A strictly controlled diet with a single novel protein and a single novel carbohydrate

Explanation - Based on the signalment, history, and physical findings, you should be most suspicious of flea allergy dermatitis (FAD).

FAD can occur in any aged dog but typically dogs over 6 months of age. Unlike canine atopy and food allergies which usually have a gradual onset of pruritic signs, FAD can have a rapid onset, as described in this case. Additionally, the distribution and description of the lesions over the caudal half of the body are classic for canine FAD. The most common sites affected for atopy or food allergy are the face, paws, distal extremities, ears, and ventrum.

There are many treatment options for FAD including:

Imidacloprid (Advantage), also available with 44% permethrin as "Advantix".

Fipronil & S-Methoprene (Frontline Plus)

Selamectin (Revolution)

Nitenpyram (Capstar)

Lufenuron (Program), also available with milbemycin as (Sentinel)

Spinosad (Comfortis)

Dinotefuran, Permethrin & Pyriproxifen (Vectra 3D)

In addition to insecticidal treatments, flea allergy sometimes needs to be treated with anti-pruritic or antibiotic drugs to address secondary infection; however, the question is specifically asking for treatment of the primary underlying etiology, which, in this case, is the presence of fleas.

Hyposensitization injections would be the treatment for atopic dermatitis.

A dietary change would be appropriate for food allergy.

Antibiotics would be appropriate for a primary pyoderma.

Cyclosporine is an adjunct therapy used in atopic dogs.

Question

A 7-year-old pit bull mix presents with these skin lesions (see image) and mild pruritis. What is the LEAST likely differential?



- Demodectic mange
- Bacterial pyoderma
- Pemphigus
- Sarcoptic Mange

Explanation - The lesions in the image are pustules, which form with neutrophilic inflammation and are accumulations of dead or dying polymorphonuclear leukocytes. Pustules are seen with differing types of dermatitis ranging from bacterial pyoderma, demodicosis, allergic reaction, and pemphigus. Determining the primary etiology will aid in proper treatment and resolution. Diagnostics that are always appropriate for diagnosing skin infections include skin scraping, impression smears, hair plucking for fungal culture, and biopsies if the preliminary diagnostics are unrewarding. Woods lamp can be used as well to diagnose dermatophytosis; however a negative results does not preclude a dermatophyte infection and culture should be pursued.

Demodicosis is the only mite infection that has been known to cause pustules or papules.

Sarcoptes, Cheyletiella, and Otocaria are not known to cause pustules. Sarcoptes is also usually associated with intense, not mild, pruritis. Dermatophytosis and Trombiculosis can cause pustules, but this is not routinely seen.

Question

What breed of dog develops a dermatosis that seems to be related to a relative Zinc deficiency?

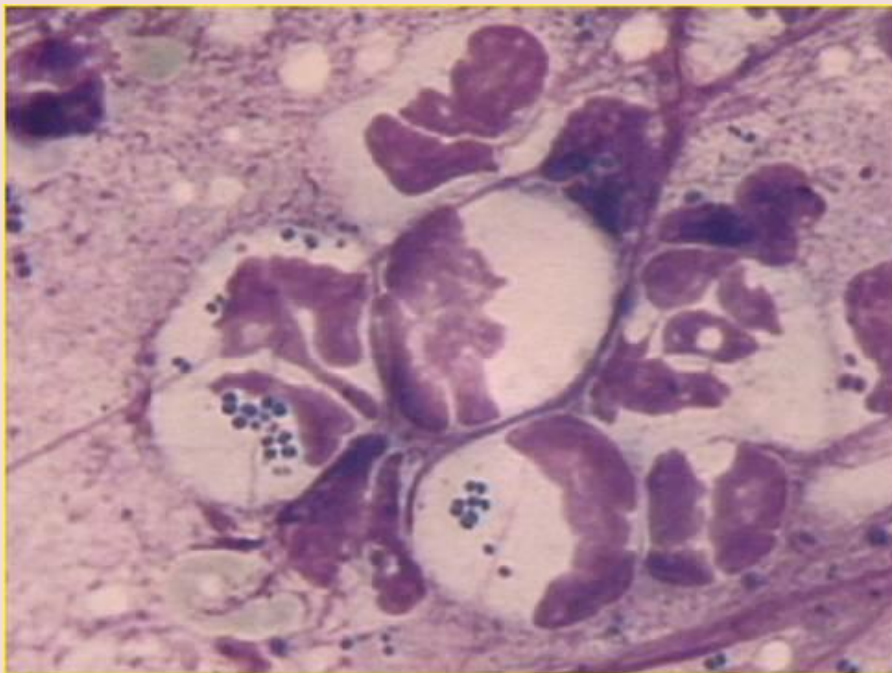
- Siberian Husky
- Shetland Sheepdog
- Bull dog
- Cocker Spaniels

Explanation - The correct answer is Siberian Husky. This syndrome has also been seen in Alaskan Malamutes. They develop a crusting skin disease referred to as Zinc Responsive Dermatitis, where there is scaling, crusting, and alopecic dermatitis most frequently around the eyes, ears, prepuce, scrotum and vulva.

Absolute dietary deficiency of Zinc is rare. Zinc responsive dermatosis is related to defective intestinal absorption of Zinc. Oral Zinc supplementation can bring rapid resolution in most patients.

Question

A 4-year old Poodle presents to you with pruritus, pustules, crusts, and alopecia multifocally distributed about the trunk. You perform cytology on a ruptured pustule; a representative field is shown below. What is the most common etiologic agent causing pyoderma in the dog?



- Staphylococcus aureus
- Staphylococcus pseudintermedius
- Streptococcus canis
- Mycoplasma canis

Explanation - The correct answer is *Staphylococcus pseudintermedius*. Pyoderma is common in dogs because the canine stratum corneum is a less efficient barrier to bacteria than in other species. Dogs lack an ostial plug in their follicles, a characteristic which allows bacteria to invade and colonize more readily. Mixed bacterial infections are possible, but *Staph. pseudintermedius* is the most common primary bacterial invader.

Question

What is the appropriate treatment for a dermatitis known to be caused by a food allergy in a dog?

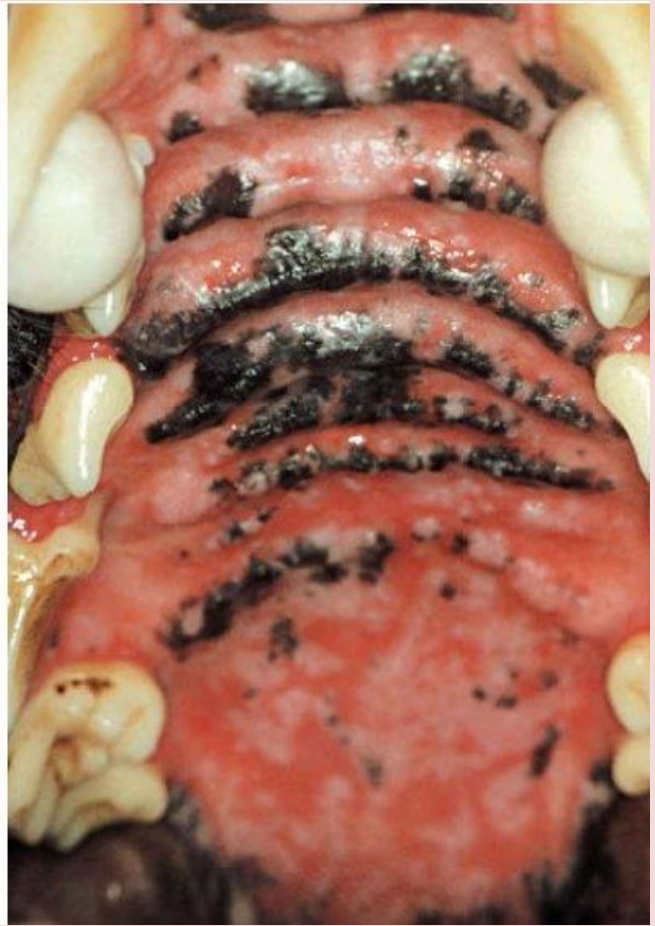
- Feeding a diet with novel protein and carbohydrate sources or a hydrolyzed diet.
- Antihistamines
- Hyposensitization treatments
- Corticosteroids

Explanation - The correct answer is feeding a diet with novel protein and carbohydrate sources or a hydrolyzed diet. Hydrolyzed diets are a good alternative to novel protein diets when the diet history is unknown or the pet has been exposed to many proteins. Hydrolyzed diets reduce the size of the protein and thus minimize the ability to cross link with IgE and cause mast cell degranulation. Antihistamines, corticosteroids, and hyposensitization treatments are used for atopic patients. If food allergy is the animal's only problem, it should resolve with feeding a diet with novel protein and carbohydrate sources.

Question

A 5-year old male neutered German Shepherd presents with a history of nasal dermatitis. Previous treatment with a 2-week course of antibiotics and prednisone resulted in partial improvement of the lesions followed by recurrence. On physical examination, you see the lesions on the nasal planum and oral mucosa shown in the images.

You perform a biopsy, and histopathology shows clefts characterized by residual basal keratinocytes remaining attached to the basement membrane zone and having a "tombstone" appearance. The intact primary bullae are non-inflammatory, but there is mononuclear inflammation of the superficial dermis. IgG and complement deposition between keratinocytes at all levels of the epidermis is present. The histologic diagnosis is pemphigus vulgaris. Which of the following is appropriate information to give the client regarding the treatment AND prognosis for this condition?



- 2-4 mg/kg of prednisolone twice daily with possible addition of azathioprine is recommended but the long-term prognosis is poor
- 0.1-0.5 mg/kg of prednisolone twice daily with possible addition of azathioprine is recommended and the long-term prognosis is good for most dogs
- 2-4 mg/kg of prednisolone and concurrent treatment with retinoids is recommended but the long-term prognosis is poor
- Treatment with 0.1-0.5 mg/kg of prednisolone twice daily with the possible addition of topical tacrolimus is recommended and the long-term prognosis is good for most dogs
- Treatment with fluconazole and/or clotrimazole is recommended and the long-term prognosis is good for most dogs

Explanation - Pemphigus vulgaris is an autoimmune disorder causing vesicles, ulceration, and crusting. It can affect the whole body, but it especially affects the mucocutaneous junctions and oral mucosa. The onset of the disease can be sudden (acute) or gradual over many weeks (chronic).

The disorder is caused by an IgG autoantibody that binds to intracellular adhesion molecules (desmoglein) causing a loss of cohesion between keratinocytes resulting in acantholysis, vesicle formation, and eventually ulceration.

The treatment is immunosuppressive therapy with corticosteroids and frequently additional immunomodulatory or immunosuppressive drugs such as azathioprine, cyclophosphamide, chlorambucil, or others. Unfortunately, long-term therapy is generally required and these treatments cause serious side-effects long-term. Prognosis is poor and euthanasia is often performed.

Question

What is the most appropriate method for diagnosis of dermatophytosis in order to develop the best treatment and management recommendations?

- Wood's lamp fluorescence of hair
- Microscopic examination of macroconidia
- Analysis of endothrix or ectothrix spores in hairs
- White colony growth and red color change at 5 to 7 days

Explanation - Proper management of dermatophytosis requires identification of genus and species, which can only be done from microscopic examination of macroconidia. Only about 50% of *Microsporum canis* strains fluoresce with ultraviolet light (Wood's lamp). *Microsporum gypseum* and *Microsporum canis* can both present as white colony growth with a pH change at 5 to 7 days, but require different management strategies. The source of *M. gypseum* is soil; the ultimate source of *M. canis* is a potentially asymptomatic cat.

Question

You are called out on a house-call to see the 3-year-old male Labrador retriever shown in the photo below. He presents for bilateral periocular edema (see photo) and facial pruritus. This has been a recurrent problem for the last 4 months. The owners reported the dog would be normal for several days, and then acutely develop the periocular swelling and itching. These episodes always happened while the dog was inside the house.

The previous episodes would last for several hours, and then the edema would resolve en route to the veterinary clinic. After each episode, the dog had some residual periocular or facial pruritus for 1-2 days.

You perform conjunctival swabs and aspirates of the edematous area which reveal large numbers of eosinophils.

What is the most likely underlying cause of the dogs signs?



- Autoimmune disorder
- Parasitism
- Bacterial infection
- Hypersensitivity
- Neoplasia

Explanation - Edema as you see here is a common clinical sign of a type I hypersensitivity reaction or allergy. The intermittent nature of the episodes suggests some type of allergic reaction, most likely infrequent contact with a potent allergen to which the dog has become sensitized. An underlying allergic etiology is further supported by the presence of eosinophils.

Identifying the underlying allergy in cases like this one can be challenging, and a thorough history and investigation of the dog's environment is warranted.

The other answer choices presented are less consistent with the recurrent and sudden clinical signs that are repeatedly observed.

Question

A 4-month old intact male Collie presents for severe dermatitis along his nose and ears (see image). The areas are sensitive on palpation but not pruritic. No other areas are affected. Skin scraping and cytology are negative for mites or bacteria. Fungal culture is negative. Anti-nuclear antibody tests are ordered and are also negative. How do you educate the owner based on your presumptive diagnosis?



- The disease is familial, and is often cyclic and will regress.
- The disease is not curable; euthanasia should be discussed.
- Long-term immunosuppressive medications are needed.
- Biopsy and culture are necessary, long-term therapy often needed.

Explanation - Familial dermatomyositis is a familial disease seen in Collies, Shetland sheepdogs, and other collie breeds. Diagnosis can be made with skin or muscle biopsies, but can be difficult as the clinical and histopathologic signs can wax and wane. Inciting causes can include vaccinations, sunlight, viral infections, or drugs. Some cases; however, will come and go without obvious inciting causes. Some cases can become severe enough to include muscle atrophy; megaesophagus has also been seen with this disease.

Treatments are often symptomatic and supportive and include Vitamin E supplements, Omega 3 fish oils, treatments for any secondary bacterial infections, and pentoxifylline. Prednisone can also be used to get more severe cases under control. Avoiding prolonged sun exposure can also help.

Educating the owner on the fact that signs will reoccur despite treatment can alleviate some owner frustrations. Often times signs will regress with or without treatments. Educate owners on neutering animals to prevent propagation of diseased animals.

Question

Which of the following breeds is predisposed to acanthosis nigricans?

- Labrador Retriever
- Dachshund
- Great Dane
- Boxer

Explanation - The correct answer is Dachshund. The primary inherited form of this condition almost exclusively occurs in Dachshunds. Other dogs may get a form of the condition secondary to other skin diseases. The condition is characterized by hyperpigmentation of the axillary and groin regions and can spread to other parts of the body. Secondary bacterial infections, yeast infections, and seborrhea commonly develop in the affected regions. The mode of inheritance has been proposed to be autosomal recessive or polygenic inheritance.



Question

Which of the following anatomic locations commonly shows lesions caused by fleas in dogs?

- Lateral thorax
- Skin on the tail base and dorsal lumbosacral region
- Periorbitally and around the muzzle
- Feet

Explanation - The correct answer is skin on the tail base and dorsal lumbosacral region. Other less common distribution patterns of lesions caused by fleas is along the caudal medial thighs, abdomen, or a generalized pattern.

Question

Which of the following endocrine imbalances does not commonly cause a dermatosis in dogs?

- Hypothyroidism
- Hyperadrenocorticism
- Central diabetes insipidus
- Sertoli cell tumors

Explanation - The correct answer is central diabetes insipidus. Males with Sertoli cell tumors may develop bilateral alopecia with occasional pruritus and papular eruptions. Hypothyroid dogs often develop alopecia, seborrhea, and pyoderma. Hyperadrenocorticism patients commonly develop hyperpigmentation, alopecia, calcinosis cutis, seborrhea, and pyoderma.

Question

A 12-year old male neutered West Highland Terrier presents with diffuse hyperkeratosis of the footpads which are also fissured and ulcerated (see image). He also has a few lesions along the tips of the ears and near the eyes. He is currently taking famotidine, phenobarbital for seizures which have been well controlled, and occasional prednisone due to his severe allergies. Lab work shows the following abnormalities:

HCT 30% (RR 36-50%)

ALT 630 IU/L (RR 3-33 IU/L)

ALP 550 IU/L (RR 10-80 IU/L)

AST 325 IU/L (RR 0-20 IU/L)

Skin scrapes are negative so you perform a skin biopsy to make a definitive diagnosis, as you are concerned that his skin lesions are being caused by which of the following conditions?



- Hepatocutaneous syndrome
- Zinc deficiency
- Demodecosis
- Systemic lupus erythematosus

Explanation - Hepatocutaneous syndrome refers to a necrotizing skin disorder that is often associated with metabolic or vacuolar liver diseases. Diseases that potentially cause this syndrome in the dog include glucagonoma, phenobarbital-induced hepatopathy, mycotoxin hepatopathy, copper-associated hepatitis, glucagon-secreting hepatic tumors, and hepatopathies of unknown

origin. Hepatocutaneous syndrome is most often associated with some sort of hepatopathy in the dog. Your clues in this patient were the history of phenobarbital use, elevated liver enzymes, and the skin lesions.

Skin biopsy and histology are required for definitive diagnosis of this condition. Abnormalities include marked, diffuse parakeratotic hyperkeratosis, intercellular and intracellular edema, keratinocyte degeneration, and hyperplastic basal cells. These changes create a characteristic red, white, and blue histologic appearance (see image). Biopsy samples should be taken from multiple sites, with footpad samples included. Ultrasound of the liver often shows a pathognomonic honeycomb appearance.



Question

A 2-year old female spayed Spaniel-cross presents to you with sneezing and ocular discharge. On examination, the dog appears systemically healthy with normal vital parameters. You are suspicious of a viral upper respiratory tract infection with possible secondary bacterial infection and prescribe a 2-week course of cephalexin. 10 days later, the dog returns to your clinic with a fever and severe cutaneous ulcerations as shown in the image which the owner says began just 3 days ago. Skin biopsy confirms coagulative necrosis of the epidermis with mixed inflammation in the dermis and epidermis. Which of the following should you tell the owner?



- You are most concerned about development of a drug-resistant and aggressive form of Streptococcus and the dog should be quarantined with additional antibiotics prescribed pending cultures
- You are most concerned that the dog actually had nasal lymphoma originally which has now disseminated systemically including to the skin; she should be fully staged and treated for lymphoma
- You are most concerned that the dog actually had an aspergillus infection which was not susceptible to cephalexin and she now has systemic aspergillosis; the dog should be hospitalized and started on antifungals
- You are most concerned about a severe and potentially life-threatening cutaneous drug reaction and the dog should be hospitalized for supportive care and testing

Explanation - The history and clinical appearance are very concerning for toxic epidermal necrolysis (**TEN**) which is usually associated with an adverse reaction to a drug. In severe cases such as the dog shown in this image, there is concern for extensive loss of fluids, electrolytes, and colloids as well as secondary bacterial infection of the skin. Concurrent medications should be withdrawn and aggressive supportive care, analgesia, and use of a different antibiotic protocol are indicated. The prognosis is guarded depending on response to removal of a suspected inciting cause.

The other possibilities listed in this question are less consistent with the cutaneous lesions shown and the very rapid onset and progression as well as the histopathologic findings.

Question

A 2-year old female Labrador Retriever presents for non-seasonal pruritus of the head and feet. Signs first started around five months of age. The patient was recently treated with a 4 week course of Cephalexin. No evidence of infection is currently seen on skin cytology, but the patient is still pruritic. The dog is otherwise healthy and on flea control. What is your next diagnostic step.

- Serum ELISA for environmental allergens
- Intradermal skin testing (IDST)
- A diet trial with a novel protein diet or hydrolyzed protein diet
- Serum ELISA for food allergens

Explanation - The correct answer is a diet trial. Serum testing for food allergies is unreliable.

This question requires you to think about underlying causes of allergies (flea, food, environmental). Food allergy fits with the age of onset of clinical signs and the fact the dog shows non-seasonal pruritus. The dog is already on flea control. IDST and serum ELISA are used for determining which environmental allergens an animal is allergic to.

Environmental allergies may be a contributing factor to the overall allergy stimulation of the dog. Typically, diet trials are performed before IDST to rule out food allergy especially when the clinical presentation fits food allergy.

Question

Which of the following is an adequate treatment for the dog in the picture?

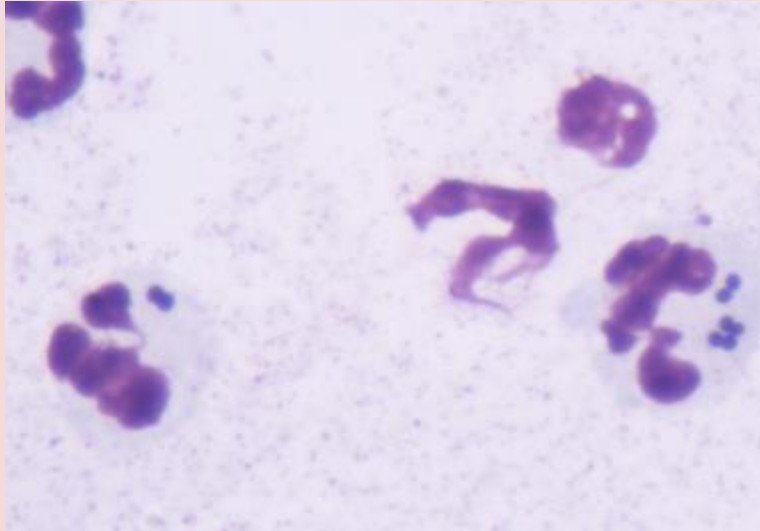


- Phenoxybenzamine
- Diethylstilbesterol
- Diphenhydramine
- Atropine

Explanation - The correct answer is diphenhydramine. This dog has a swollen muzzle most likely due to type 1 hypersensitivity. Diphenhydramine is an anti-histamine and will reduce the clinical signs associated the allergic reaction.

Question

A 12-year-old mixed breed female spayed dog presents with a several-month history of lethargy, hair loss, and greasy skin. The patient's face, feet, and tail are not clinically affected and she is mildly pruritic. This photomicrograph shows the results of impression cytology obtained from the patient. What is the most likely name of the organism pictured?



- Staphylococcus pseudintermedius (Staphylococcus intermedius)
- Malassezia globosa
- Malassezia pachydermatis
- Staphylococcus hyicus

Explanation - Intracytoplasmic cocci from a dog's skin are most likely Staphylococcus pseudintermedius (formerly called Staphylococcus intermedius), which is the species host-adapted to canines. Staphylococcus hyicus is host-adapted to pigs, so is less likely to be isolated from a dog. Malassezia (yeast) organisms are much larger than cocci and are not observed within the cytoplasm of neutrophils.

Question

A 6-month old Chocolate Labrador presents for limping and failure to gain weight. He is housed in an outdoor kennel with other hunting dogs. He is fed a large breed dry puppy food. He received his puppy shots at 8, 12, and 16 weeks old. He is quiet, alert, and responsive. His body condition score is 3/9, with rib exposure and poor fat deposition. His mucous membranes are pale pink, with a capillary refill time of 2 seconds. His heart and lungs auscult normally. No abnormalities are felt on abdominal palpation. He is an intact male, and both testicles are descended. The only abnormalities are the pads of his two front feet and left hind foot (see image) that he chews at frequently. What is diagnostic test of choice?



- Biopsy
- Fecal float
- Radiographs
- CBC and chemistry panel
- Skin scraping

Explanation - Hookworms (*Ancylostoma* and *Uncinaria*) are intestinal parasites that suck blood and can cause anemia, enteritis, coughing during larval migration, and dermatitis. Any young dog that is failing to thrive and/or has pale mucous membranes should be tested for intestinal parasites. **Hookworm dermatitis**, also called Ancylostomiasis is typically seen in conditions with **poor sanitation and/or in kennels**.

Hookworms can be transmitted in utero, during nursing, or via 3rd stage larva penetrating the skin. The most commonly affected skin areas are the pads and interdigital spaces of the feet, but can include any surface that contacts the ground. The larva migrate through the dog's tissues before arriving in the intestines. They cause significant anemia, failure to thrive, or sudden death in young dogs. In mild cases, deworming protocols are often enough; with severe cases blood transfusions and parenteral treatments are often necessary.

Skin scraping and impression smears of the affected skin areas are typically unrewarding for isolating parasites. A PCV/TP would show signs of anemia, but not the underlying etiology. Complete blood cell count and chemistry will often show anemia that is regenerative and an eosinophilia. Radiographs would be unrewarding in this case. A biopsy may show migrating larva if biopsied soon after trauma, however this is not a diagnostic test routinely used.

Question

A 7-year old Cocker Spaniel presents for scratching at her ears and shaking her head for the past two weeks despite treatment with topical antibiotics. She has a 2 year history of ear infections. Physical exam is unremarkable except for the ears (see image). What is the most appropriate next step?



- Lateral Canal Ear Ablation
- Culture and Sensitivity
- Topical antibiotics and oral steroids
- Topical antibiotic and topical steroids
- Sedation and deep ear cleaning

Explanation - Chronic otitis externa is common in Cocker Spaniels and other long-eared breeds. It is typically due to underlying diseases such as allergies (food, seasonal, or both) or hypothyroidism, which should be concurrently diagnosed and managed.

With chronic otitis, culture and sensitivity is needed due to multiple rounds of previous antibiotic therapy leading to resistance. The most common bacterial ear infections are Staph. pseudintermedius, but Pseudomonas, E. coli, and Proteus bacterial ear infections are not uncommon and can have multiple resistance patterns. It is also common for malassezia to be found concurrently.

With severe chronic ear infections it is not uncommon for the tympanic membrane to rupture, for middle and inner ear infections to occur, and for Horner's Syndrome or vestibular disease secondary to otitis media to develop. Chronic ear infections also lead to thickening of the ear canal, stenosis, and complete closure of the lateral canal. This can make topical treatment difficult and surgical intervention may be warranted.

Steroids have been used systemically and topically to quiet the severe inflammation and pain associated with severe ear infections. Often times oral antibiotics are not sufficient, and topical antibiotics therapies need to be done daily for weeks to months. When medical management fails surgery is recommended; usually in the form of a total ear canal ablation and a lateral bulla osteotomy.
