UC DAVIS SCHOOL OF VETERINARY MEDICINE • CENTER FOR EQUINE HEALTH

HorseReport

SPRING 2022

Dermatology Issue

THANKS TO OUR COLLABORATOR

Dr. Stephen White is a professor in the Department of Medicine and Epidemiology and is the Chief of Service for the UC Davis veterinary hospital's Dermatology Service. A diplomate of the American College of Veterinary Dermatology, he is a leading expert on dermatological conditions in multiple species. His esteemed career has included exceptional contributions to clinical practice, teaching, and research. In 2020, Dr. White was the recipient of the Frank Kral Award presented by the American Academy of Veterinary Dermatology (AAVD) in recognition of outstanding achievements and dedicated service to the veterinary profession and the specialty of veterinary dermatology.

His research focus on equine dermatology has contributed to our understanding of a variety of equine skin conditions, including hereditary equine dermal asthenia (HERDA), alopecia areata, and cutaneous vasculitis, as well as equine allergy testing and further advances in diagnostics and therapeutics.

DIRECTOR'S LETTER

Welcome to the Spring 2022 issue of the Horse Report!

While I know that we are all enjoying more sunshine and getting back to riding our horses in the daylight, spring also brings with it pollen, rain, and insects, all of which can cause problems for our horses' skin. We teamed up with UC Davis veterinary dermatologist Dr. Stephen White, who has a long-standing interest in equine skin diseases, to bring you the latest on this topic and explain how skin health often extends beyond the surface.

As a horse owner myself, many of these conditions are all too familiar. Battling summer sores, scratches, hives, and other skin conditions is never fun, but identifying problems early and treating them appropriately is key to successful outcomes. Equine dermatology is a broad area, and while this issue focuses on several common equine skin conditions, we invite you to explore our online database of equine health topics for information on additional skin diseases. Our list of available topics is always growing, so be sure to check back often for new entries!

With the new year in full swing, we look forward to sharing many exciting plans with you – hopefully in person! At the end of 2021, we announced the Center for Equine Health's expansion to Templeton Farms near Paso Robles, California. We are incredibly grateful to Gina Bornino Miller and Bill Miller for this generous donation and for their vision for creating a bright future for California's horses. This spectacular property has a reputation for excellence and we are committed to providing top-quality services while enhancing our research and educational efforts to improve horse health and performance for many years to come.

Keep an eye on our website and social media accounts for the latest information and news from our Northern and Central California locations.

Thank you for your continued support as we look to the exciting future of equine health in California and beyond!

Carrie J. Finno, DVM, Ph.D., Diplomate ACVIM
CEH Director

Templeton Farms

CEH Teaching Herd Horse's Battle with INSECT HYPERSENSITIVITY

The incredible horses that comprise the Center for Equine Health teaching herd spend their second careers teaching veterinary students and residents and contributing to CEH's efforts to advance health for all horses. They provide opportunities for students to see a variety of equine conditions firsthand, including equine skin allergies.

Beloved long-time herd member Achilles, a Thoroughbred gelding, was a successful racehorse with 22 starts and more than $200,000 in career earnings. His athletic career was cut short due to a spiral fracture in his left front cannon bone. He was donated to CEH in 2002, and has served as a blood donor for patients at the UC Davis veterinary hospital in addition to his teaching duties. At 26-years-young, he still does some teaching, but he has also turned out to be a star babysitter for our weanlings.

In 2018, Achilles suddenly developed crusty, ulcerative skin lesions on multiple parts of his body, along with hives on his left shoulder and abdomen. He was 23 years old at the time and had no known history of allergic reactions.

The punch biopsy culture of one of the skin lesions did not grow any microorganisms, but further testing revealed high levels of eosinophils, specialized white blood cells that play a role in the body's immune response, indicating an allergic reaction. The resulting diagnosis was eosinophilic dermatitis. A fly-bite hypersensitivity reaction was suspected as the cause, and Achilles was treated with an oral antihistamine and bathed daily with antifungal/antimicrobial shampoo. His skin lesions steadily improved. He had a relapse of hives a few weeks later, but another course of treatment resolved his clinical signs.

Biting insects such as flies, midges, and others can cause hypersensitivity reactions in some horses. Although horses from any breed can be affected, increased susceptibility in certain breeds suggests a genetic component in addition to environmental factors. Attempts to prevent these types of allergic reactions mainly involve reducing insect exposure, which can be challenging.

Achilles has recovered fully and has not had any further related incidences. Our staff monitor him closely, and he is no stranger to fly masks and fly spray, especially during the summer months.

Ulcerative skin lesions were apparent on the right side of Achilles' face (above), and began to heal with treatment (below).

Achilles (R) takes his role as a babysitter for our weanlings very seriously. He is pictured here with our 2019 colt, Cuervo (L).

Achilles in February 2022.

A Scratch for Every Itch – EQUINE SKIN ALLERGIES

A horse with hives on the head and neck due to seasonal environmental allergens.

Horses scratch for many reasons. They scratch themselves on fences, rub up against posts (and sometimes people), roll on the ground, and groom each other. A natural behavior usually linked to social bonding, comfort, and relaxation, it can be heightened seasonally by shedding, sweating, or the presence of insects. However, when scratching becomes frequent enough to result in hair loss, broken skin, scabs, or disrupts eating or sleeping, it is time to talk to a veterinarian to determine if a skin allergy is to blame so appropriate treatments can be pursued.

Allergies are the result of immune reactions to proteins that the body identifies as foreign (allergens). They are often caused by repeated exposures to pollens, weeds, grasses, molds, insect bites, medications and feeds (although food allergies in herbivores are rare). Equine skin allergies typically cause abnormal itching (pruritus) and hives (urticaria).

Breaking Out In Hives

Among domestic animals, horses are the most likely species to be affected by hives. These raised, round patches on the skin are not a disease themselves. Rather, they are skin lesions or reaction patterns that result from certain diseases and conditions.

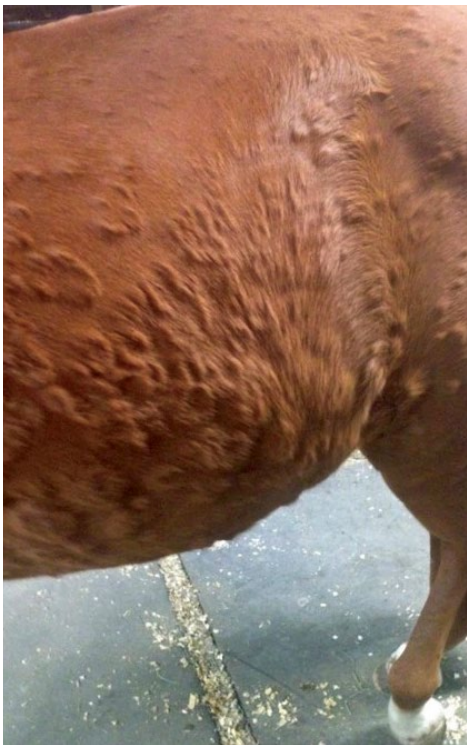
Frequent causes for hives in horses include:

- Atopic dermatitis (environmental allergy: pollens, molds, etc)
- Drugs and medications
- Insect/mite bites or stings
- Chemical contact (plants, dyes, detergents, soaps, insecticides, etc.)

Less common causes are:

- Dermatophytes (ringworm)
- Pemphigus foliaceus (auto-immune skin disease)
- Stress
- Vasculitis (including purpura hemorrhagica)
- Pressure or trauma to the skin
- Cold
- Exercise
- Feed

Hives typically appear suddenly and in large numbers. The most distinguishing characteristic is that they 'pit' if you put pressure on them. It is important to try to determine the underlying cause of hives by evaluating the horse's medical history in order to provide proper treatment. A seasonal itch, for example, would be most consistent with atopic dermatitis to pollens, whereas an itch that persists year-round is more likely to be a reaction to molds, barn dust, or feed. Episodes of itching that occur after topical treatments of shampoos, dips, etc. would be consistent with a contact allergy.



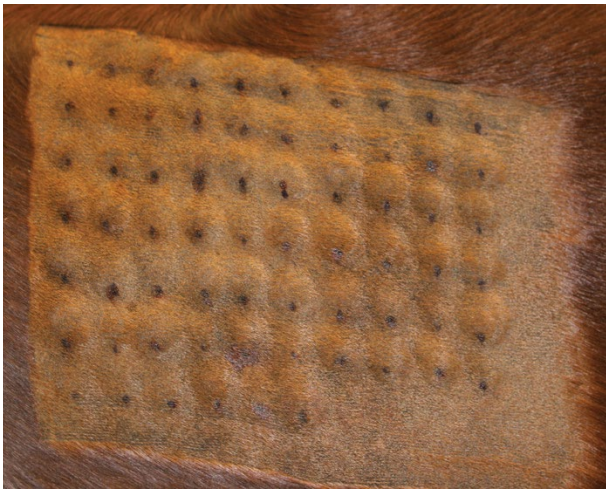
A 16-year-old American Quarter Horse gelding before (L) and after (R) hyposensitization.

Allergy Testing and Allergy Shots

Intradermal tests (IDT) and serum (blood) allergy tests are often used to identify allergens responsible for hypersensitivity reactions. Similar to allergy tests in humans, IDT involves injecting extracts from pollens, molds, and other environmental substances into the skin (often in a grid pattern; see picture below) and measuring injection site responses anywhere from 30 minutes to a few hours later. Serum (i.e. blood) allergy tests are not always in agreement with IDT. Studies have reported variable repeatability for either method across time and individual animals, which could be due to a variety of factors. Horses with atopic dermatitis and recurrent hives generally have a higher incidence of positive reactions than healthy horses.

Allergens identified as causing hypersensitivity reactions, and interpreted in light of the horse's known disease history, clinical signs, and elimination of other causes, may then be used for hyposensitization therapy (also known as allergen specific immunotherapy (ASIT), or 'allergy shots'). A study that evaluated treatment of cases of atopic dermatitis at the UC Davis veterinary hospital over 17 years noted an approximate 70% success rate in hyposensitization in horses; an analogous study at the University of Pennsylvania reported similar results. Interestingly, whether the hyposensitization is based on IDT or serum tests, the success rate is approximately the same. There is now the option of using oral hyposensitization instead of injections.

The ultimate success of this type of therapy depends on adherence to instructions set forth by the veterinarian. This includes anticipating that injections will need to be administered (usually by the owner or the horse's caretaker) for at least a year, even if decreased clinical signs are observed within a shorter period. Approximately 85% of horses that respond to the therapy need continued hyposensitization for life, although often at decreased frequency.



Equine intradermal allergy test

Hair loss from dermatophytes (i.e. ringworm).

Looks Can Be Deceiving: RINGWORM AND ITS LOOK-ALIKES

Although ringworm can appear as a ring-like mark on the skin, it has nothing to do with worms. Ringworm is actually a fungus.

On the surface, the term "ringworm" sounds straightforward. Although it can appear as a ring-like mark on the skin, it has nothing to do with worms. Ringworm is actually a fungus. To add to the deception, several conditions look like ringworm, but are something else entirely.

Ringworm – Not a Worm

The medical term for ringworm, dermatophyte, may restore some faith as it does mean a fungus that infects the skin. Once an infection (dermatophytosis) is established, the offending fungus announces its presence, usually in the form of an itchy, circular pattern of hair loss (the 'ring'), sometimes accompanied by redness or a rash. In horses, it commonly occurs on the girth and saddle areas and can spread to other parts of the body.

The skin reactions are easy to see, but the multiple species of dermatophytes that can infect horses are less than forthcoming about their everyday presence, hiding out of sight in the soil, or stowing away on fomites such as shared grooming equipment and tack. The fungus can be present on horses for a few weeks before clinical signs appear, and can spread from one horse to another by direct contact. These sneaky tactics mean that ringworm can also infect people or other animals, spreading through otherwise seemingly innocuous routes.

Diagnosing ringworm involves taking a hair sample for a fungal culture in the laboratory. It is important to confirm the diagnosis, as other conditions can mimic ringworm in appearance, and the most effective treatments can be very different.

Ringworm Look-alikes

Although ringworm is a common equine skin condition, it is not the only possible cause of hair loss and rashes. Ringworm look-alikes include bacterial ('staph') skin infection, occult sarcoid (a type of skin cancer), and alopecia areata, a rare autoimmune skin disease where the body's immune system mistakenly attacks the hair bulb. Rain scald (dermatophilosis) may also resemble ringworm.

The clinical signs of staph infections can resemble ringworm.

Ignore It and It Will Go Away?

In some cases, ringworm resolves on its own without treatment, but it can take a month or more. Therefore, it is important to treat horses as soon as possible to limit their discomfort and avoid spreading the fungus to other animals and people.

Treatment may consist of antifungal shampoos, dips, or topical therapies. Oral treatments such as griseofulvin and terbinafine are also available, but potential unwanted side effects, such as liver damage, evidenced by elevated liver enzymes, and birth defects, should be taken into account. It is important to follow veterinary and product instructions to get the maximum effect. Treatment also extends beyond the horse. Tack, blankets, grooming equipment, and other potentially contaminated surfaces should be disinfected to limit the spread of disease. If a known soil-borne fungal species is identified through laboratory culture, the ground and/or stall floor should be treated with bleach to try to eliminate the organism.

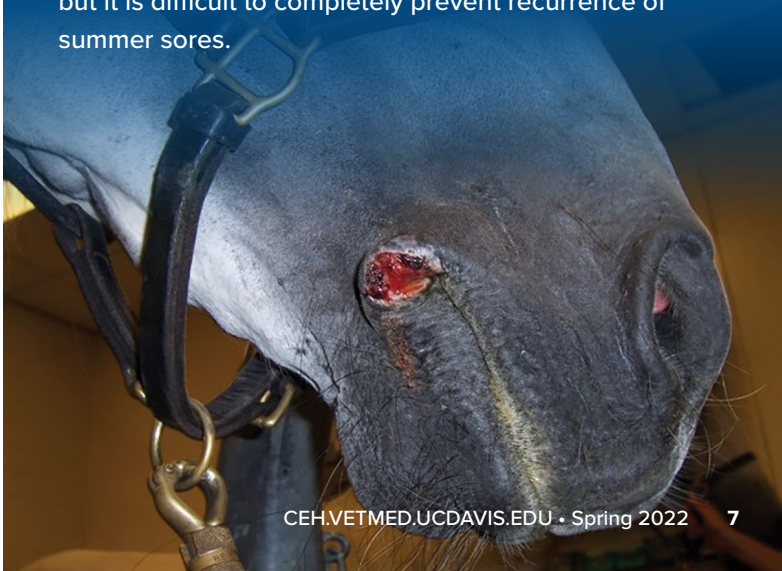
Whereas bacteria usually grow quickly in culture, fungi grow in the laboratory over a period of weeks. It is not uncommon for clinical signs to resolve before the results of the culture are known. However, the results may still be beneficial for cases that are difficult to treat, or to provide information on appropriate treatments for other affected animals on the premises and limit the potential spread to humans.

SUMMER SORES

Unlike ringworm, summer sores are actually caused by worms (scientific term: nematode). Habronemiasis, now called habronematidosis, is a disease attributed to any of the three species of *Habronema* worms that parasitize the horse: *H. muscae, H. microstoma,* and *H. megastoma.* Adult worms live in the stomach where they typically cause little reaction. Females lay eggs and the larvae are passed in the feces where they are ingested by the maggots of either the housefly or the stable fly, which serve as intermediate hosts. The normal life cycle is complete when flies deposit the infective larvae around the horse's lips, where they are subsequently swallowed and the larvae develop into adults in the stomach.

Summer sores develop when the larvae are deposited in previously damaged skin or mucous membranes such as the lips, nostrils or genitalia where they cannot complete the life cycle and instead cause a local inflammatory reaction. The lesions themselves consist of areas of ulceration that usually contain small, gritty, yellow nodules ('sulfur granules').

The disease is seasonal, first appearing in the spring and in most cases spontaneously regressing in the winter months. Effective treatment involves a veterinarian cleaning the wound (debriding), often along with administration of ivermectin, corticosteroids, and topical treatments. The wound should be covered, if possible, and it is important to follow stringent fly management practices. Once the disease develops in a horse, it will usually recur every summer. A genetic susceptibility has been proposed in some horses, especially those affected annually, but further research is needed. Adhering to strict fly preventative measures can minimize recurrence, but it is difficult to completely prevent recurrence of summer sores.



Mucous membranes, such as the lips, are the areas most commonly affected with summer sores. ▶

SCRATCHES – A Problem No Matter What You Call It

Pastern dermatitis, also known as scratches, greasy heel, mud fever, mud rash, cracked heels, and dew poisoning, has been well documented in horses since the early 1800s. It is commonly characterized by inflammation of the skin on the back of the pastern(s). Regardless of which name is used, most horse handlers will likely have to deal with it at some point. It is important to note that what can start as a minor skin annoyance can become a painful chronic condition if not treated properly.

Horses with pastern dermatitis usually exhibit multiple lesions in the pastern area. Initially, patchy red skin (erythema), oozing, crusting, erosions, and ulcerations develop, followed by swelling (edema) of the affected limb(s). The skin can be itchy and sensitive. Lameness is observed in some cases and can become severe.

Although pastern dermatitis can occur in any horse breed, it is most common in draft breeds and others with heavy feathering on the lower legs that can trap moisture. Horses with white legs are also more susceptible as unpigmented skin is sensitive to sun damage.

It's Complicated

Pastern dermatitis is a clinical descriptive term for a disease complex that can be triggered by different causes. These can include environmental factors, allergies, drug reactions, fungi, bacteria, parasites and sunlight-induced vascular changes of white legs. Extended exposure to moisture, in the form of wet bedding, muddy pastures, etc., seems to be a common cause or perpetuating factor. Bacterial infections typically develop due to damaged skin barrier.

Chorioptic mange on the legs of a draft horse.

Clinicial signs of scratches include inflammation and lesions in the pastern area.

Underlying genetic components are considered for draft horses with chronic progressive lymphedema.

As there are many potential causes for pastern dermatitis, there are also a number of possible treatments. Diagnosis is based on biopsy for histopathology and bacterial and fungal cultures, but antibiotic therapy, accompanied by clipping and mildly cleansing the affected area (with topical corticosteroid application if one week of this has shown no improvement), is acceptable initially. Trimethoprim-sulfa antibiotics, corticosteroids, and/or resolution or control of the underlying disease process are the most common treatment modalities. In some cases, avoiding sun exposure may be helpful. Early, accurate diagnosis and appropriate treatment result in the most successful outcomes and prevention of severe chronic changes.

An Ounce of Prevention

Prevention of pastern dermatitis generally relies on avoiding exposure of the area to recurrent moisture. This includes limiting turnout of horses in wet grass or muddy pastures, drying the pastern areas well after bathing, keeping hair clipped on the lower legs, and avoiding long-term use of boots and wraps that can trap moisture. Proper stable hygiene, including providing clean, dry bedding, is essential for preventing pastern dermatitis and other health and welfare issues.

CHRONIC PROGRESSIVE LYMPHEDEMA

Chronic progressive lymphedema (CPL) is a debilitating condition caused by a buildup of lymph fluid (lymphedema) in the lower legs that results in progressive swelling. Over time, the swelling becomes firm and is associated with skin folds, nodules and ulcerations. It has been described in several draft breeds, as well as Friesians and Gypsy Vanners. Since affected horses typically develop secondary recurrent bacterial and/or parasitic pastern dermatitis, CPL is often erroneously referred to as "chronic pastern dermatitis." However, CPL is the underlying condition, which worsens with each recurrence of pastern dermatitis.

There is currently no successful permanent treatment for CPL. Careful management, supportive therapy and avoidance of secondary infections can improve the quality of life for affected horses. This involves antibiotics to treat secondary bacterial infections, antiparasitic treatments to avoid reinfestation with *Chorioptes* mites, keeping the feathers clipped short, daily exercise, routine foot, ergot and chestnut trimming, daily hoof cleaning, and combined decongestive therapy (CDT). The latter is very helpful and includes manual lymph drainage massage and compression bandaging; both must be applied correctly and should only be performed by professionals. Horses should be kept in dry environments and pesticide applications may be required in barns to minimize mite infestations. These treatments are labor-intensive and must be maintained for the life of the horse to minimize discomfort, slow the progress of the disease, avoid recurrent infections, and ensure quality of life.

Researchers hypothesize that CPL is multifactorial. The wide distribution within each of the affected breeds suggests an underlying genetic component. "Several attempts to identify genetic factors of CPL have not been successful to date," said Dr. Verena Affolter, a dermatopathologist at the UC Davis veterinary hospital who studies CPL together with Dr. Danika Bannasch, a geneticist at UC Davis. "As such, there is currently no clear path to prevent the disease in susceptible breeds." Due to the late age of onset, many horses are bred prior to diagnosis, thereby passing any genetic predisposition to future generations.

Chronic progressive lymphedema in a Belgian draft horse (L) and a Friesian (R). Both show marked nodular changes and evidence of secondary infection.

10 THINGS
YOU MIGHT NOT KNOW ABOUT
EQUINE DERMATOLOGY

The large size of a horse means that their skin covers a large surface area, often making skin problems easy to see. However, although we can see them, we cannot always easily identify their cause. We teamed up with Dr. Stephen White, DACVD, UC Davis professor and chief of the veterinary hospital's Dermatology Service, to bring to light some things you might not know about equine dermatology.

1 The skin is the largest organ of the body. It provides a barrier to the outside world, protecting the inside of the body from environmental assaults from bacteria, chemicals, heat, cold, moisture, and UV light. It allows the body to feel sensations, including itching and pain, can store water, vitamins, fat, and proteins, and produces hormones. Skin is often an outward indicator of the health of internal organs and systems.

The skin is the largest organ of the body.

2 A well-balanced diet is important for healthy skin. Minerals such as copper and zinc have roles in maintaining and repairing skin cells and ensuring the structural integrity and strength of skin. Essential fatty acids, especially omega-3 fatty acids, help skin retain moisture and key amino acids, and produce various substances that are vital to the health of skin and connective tissues. If access to pasture and good quality hay is limited, vitamin A, B, and E supplementation may be necessary to promote healthy skin.

3 Hooves, chestnuts, and ergots are modified skin structures. These horned skin structures grow continuously and are trimmed or broken off (chestnuts and ergots), or worn down (hooves). Chestnuts and ergots are natural growths that are largely cosmetic. However, in some cases abnormal growth can indicate health conditions such as laminitis. Interestingly, chestnuts are like fingerprints in that they are unique to each horse and can help with individual identification.

Eyelash hair is "permanent" and is important for protecting eyes from debris.

4 Mane and tail hair is "permanent," whereas body hair is "temporary." Equine hair is also comprised of modified skin tissue. Body hair is temporary and sheds seasonally. Permanent hair, such as mane, tail, and eyelash hair has important defensive roles, including waterproofing, insulating blood vessels and protecting eyes from debris. Although this type of hair falls out, it does not shed regularly, so permanent hair can be used to evaluate nutrition, exposure to environmental toxins, and drug administration over time.

5 Equine skin can be damaged by sun and ultraviolet (UV) light. Non-pigmented skin is especially prone to sunburn from extended exposure to UV light. Photosensitization, a sensitivity to UV light that can lead to ulceration of the skin, is a separate condition, but can be difficult to distinguish based on outward appearance. Photosensitivity can be an indicator of underlying health conditions such as liver disease or ingestion of bacterial or fungal toxins.

6 Ivermectin can be a useful tool for treating summer sores, but may only be effective after surgical intervention. Summer sores, or habronematidosis (formerly habronemiasis), are caused by the larval form of stomach worms in the genus *Habronema*. While ivermectin has historically been effective against worms in the stomach (intestinal strongyles), it often needs to be used along with other medical treatment such as corticosteroids and/or surgical intervention (debulking or cryotherapy) for treating *Habronema* skin lesions.

7 Frequent bathing of a horse's legs will not make scratches worse. It is important to keep horses' legs clean, and bathing them often has not been shown to cause scratches, or to make them worse. Medicated shampoos can sometimes even improve the condition. Although bathing itself is not problematic, ensure that legs are dried after washing, especially before going into a stall or getting wraps or boots put on as these can trap moisture against the skin, which can aggravate scratches.

Bathing a horse's legs will not make scratches worse.

8 Chronic skin diseases can predispose affected horses to secondary infections. Secondary bacterial or yeast infections often develop as a result of skin inflammation. These infections can cause increased discomfort, worsen existing inflammation, and delay healing. Antibiotics may be required to treat the infection.

9 Breeders can use genetic tests to avoid producing foals affected with some of the most severe equine skin conditions. Junctional epidermolysis bullosa (JEB) and fragile foal syndrome type 1 (FFS1) are inherited skin diseases that result in death or humane euthanasia of affected foals at early ages due to the severity of clinical signs. Although life expectancy for horses with hereditary equine regional dermal asthenia (HERDA) is longer, most affected horses are eventually humanely euthanized. The UC Davis Veterinary Genetics Laboratory offers genetic tests for all of these diseases. Genetic testing information can be used to avoid breeding carriers and producing affected foals.

Genetic testing is available for HERDA, an inherited disease that causes the skin along the horse's back and neck to stretch and tear easily.

10 Leave ear plaques alone. Touching equine aural plaques – white, crusty, wart-like growths on the inside of horse's ears – can do more harm than good. These crusty patches are not very attractive, but they usually are not a source of discomfort. Trying to scrape them away can cause pain and may make the horse head shy, and the plaques usually return anyway. Researchers from UC Davis and the University of Minnesota reported on the success of the medication imiquimod for treating aural plaques. This treatment is expensive and labor-intensive, though, so it is generally reserved for severe cases.

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Mail ID 1415
Center for Equine Health
School of Veterinary Medicine
University of California
One Shields Avenue
Davis, CA 95616-8589

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EQUINE DERMATOLOGY AT UC DAVIS

From allergies to viral skin diseases, the Dermatology Service at the UC Davis veterinary hospital can identify, manage and provide treatment for a combination of therapies tailored for each animal.

Initiated in the late 1970s by the late Drs. Anthony Stannard and Peter Ihrke, the service presently consists of three faculty members, Drs. Stephen White, Catherine Outerbridge, and Stefano Borio, two residents, and two veterinary technicians. Dr. Verena Affolter is a faculty member in dermatopathology who studies skin diseases at the microscopic and molecular levels and is very involved with group research and the teaching program. The Dermatology Service sees small, large and exotic animals, and consults with the Large Animal Internal Medicine Service on equine cases.

The service offers residency training in veterinary dermatology, comparative dermatology and related basic sciences with the goal of board certification by the American College of Veterinary Dermatology (ACVD). Residents learn about skin diseases of small, exotic and large animal species and relevant comparative aspects of human dermatology. They spend most of their time in the hospital performing the clinical functions of the Dermatology Service, along with a faculty supervisor, with each resident seeing 450-600 animals per year. Residents also participate in rounds and seminars, investigative work and other forms of training. All residents are required to initiate and complete at least one investigative project during their residency under the direction of a faculty mentor.