



*Specialty Medicine Compounding Pharmacy*

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# Competent Compounding

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## **Atopic Dermatitis**

Atopic dermatitis is a chronic form of eczema, which is an inflammatory reaction of the skin. The onset usually occurs in childhood as young as 2 years old and continue through rest of life or may spontaneously resolve and reappear in adulthood. It is characterized by itching, red to brownish gray patches, thickened/cracked scaly skin on any part of the body including the eyelids. The cause of atopic dermatitis may related due to a malfunction of the immune system.

Risk factors include allergies, weak immune system, genetic (if there is family history of allergies, atopic dermatitis), infection, stress, seasonal/climate changes, irritants such as cigarette smoke. It may worsen due to long hot baths/showers, dry skin, stress, sweating, rapid changes in temperature, low humidity, continuous exposure to irritants. About 70% of atopic dermatitis patients have asthma, hay fever, or eczema. Those with unfavorable prognosis (continued throughout life) include persistent dry or itchy skin in adult life, widespread dermatitis in childhood, family history of atopic dermatitis, early age at onset, female.

The process where the skin becomes damaged is part of continuous cycle of itching and scratching causing the skin to become inflamed, swell, crack, weep clear fluid, and crusting over. This occurs continuously or in bursts (or flares).

It is important to try and reduce the itching to prevent the condition from getting worse. Hydration and moisturizing the skin helps with the dryness and should alleviate itching. Prescription treatments include topical steroids, systemic steroids, and nonsteroid topical agents such as Elidel or Protopic ointment. Another method is phototherapy, which may have immunosuppressive properties. It is also important to control allergies, which may prevent the exacerbation of a flare, with antihistamines and any other medications that the physician would prescribe. Prednisolone, hydroxyzine hydrochloride, cyclosporine, and tacrolimus are examples of topical agents that the pharmacy

compounds.

One last method that may be of benefit is called the "Rule of 3's":

1. Do not take a bath or shower more than 3 times a week
2. Water should only be 3 to 5 degrees above the body temperature
3. If taking a shower everyday, try to limit time to 3-5 minutes
4. Pat dry the body. This leaves beads of water, which enhances the penetration of any topical agents. Apply any topical agents within 3 minutes after showering.
5. Apply body lotion 3 times during the day

## **Iontophoresis**

One method of delivering medication across the skin is transdermal patches such as those used for the pain medication fentanyl or nicotine replacement therapy. Another method is iontophoresis, which is a process that uses electrical current to drive the molecules of the medication through the layers of the skin. There are two electrical pads that are placed on two different parts of the body, one of which will contain the solution of the drug. A low electrical current is applied for about 15 to 20 minutes allowing the drug to penetrate through the skin and into blood for circulation.

Advantages of iontophoresis versus oral or injected medication therapy include reduction of side effects, avoiding risks of infection, noninvasive, less variability in absorption. It does, however, have a few disadvantages which includes improper usage causing burns, formation of blisters on the skin, and the idea of using electrical current. Minimizing time of exposure and the amount of current eliminates some of those disadvantages.

Iontophoresis delivers medication for hyperhidrosis, palmar and plantar warts, Peyronie's disease, and muscle and joint disorders. Hyperhidrosis, for example, is a condition of excessive sweating and



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iontophoresis helps turn off the sweat gland. The patient places their hands or feet in the water for about 10-20 minutes and an electrical current is gradually increased until there is a feeling of light tingling sensation. The medication used to treat hyperhidrosis is glycopyrronium bromide. Other drugs delivered through iontophoresis to treat other conditions include antibiotics, anesthetics, blood pressure medications, and more.

Compounding pharmacy plays a role in preparing the solutions for this type of drug delivery. When preparing solutions, the variables that the pharmacist has to consider are: drug concentration, salt form, pH, electrical source type, current intensity and time, viscosity of the medium, and other factors that may affect the ions in the drug solution. Examples of drug solutions are dexamethasone 4 mg/mL, lidocaine hydrochloride 4%, ketorolac 6 mg/mL, and estriol 3%.

## Pasteurella Infection due to Animal Bites

It is fun and exciting to have a pet as part of your family. Having a pet can bring your family together and create wonderful memories. However, there are some necessary precautions to keep in mind as a pet owner -- one of which is animal bites/scratches. Such injuries increase the risk for infections. Cat scratch fever, also the title of one of Ted Nugent's songs, is one type of infection due to *Bartonella henselae*. Other pathogens due to animal bites include *Pasteurella*, *Streptococcus*, *Staphylococcus*, *Bacteriodes*, and *Fusobacterium*.

150 million dogs and cats live in the United States, with cats outnumbering dogs. About 4 to 5 million people report animal bites each year; 85-90% bites involves dogs and 5-10% involve cats. Most of these bites occur while playing with dogs and cats. Dog bites are commonly seen on the face and scalp, and cat bites are seen on the arms and hands. Animal bites may be minor; however, one concern is infections and the risk for complications, which 15-20% of infections involves dogs and more than 50% are cat related. The teeth of dogs are designed to tear tissue, whereas the teeth of felines are more slender, sharp and penetrate into bones and joints easily.

*Pasteurella multocida* is a common organism isolated from cat bite wounds. It resides in the upper respiratory tract of livestock, poultry, domestic pets (cats and dogs). Signs of infection occur within 15 to 24 hours. Infections start locally on the skin and into soft tissue (cellulitis), and then may progress into other organs such as the heart and the lungs. Localized signs and symptoms include redness, warmth, pain and tenderness, purulent discharge, and joint symptoms. Respiratory symptoms may include hoarseness and sinus tenderness. Other manifestations of the infection may also present similar to meningitis with mental status changes and headaches.

Diagnosis of *Pasteurella multocida* includes infectious disease workup such as bacterial staining, imaging studies, and lumbar puncture. Treatment for this bacterial infection includes antibiotics such as penicillins such as ampicillin or amoxicillin, tetracyclines, fluoroquinolones, bactrim, and chloramphenicol. There also have been cases of multidrug resistance to *Pasteurella multocida* making treatment difficult. The outcome of recovering from infection is good as long as it is prevented from spreading and worsening. Detecting and treating the infection as early as possible has favorable outcomes. If you have any other concerns of the other infections, talk to your veterinary physician.

For more information about animal bite/scratch infections and first aid tips, check out the websites for the Centers for Disease Control and Prevention ([www.cdc.gov](http://www.cdc.gov)) and MayoClinic ([www.mayoclinic.com/health/first-aid-animal-bites](http://www.mayoclinic.com/health/first-aid-animal-bites)).

