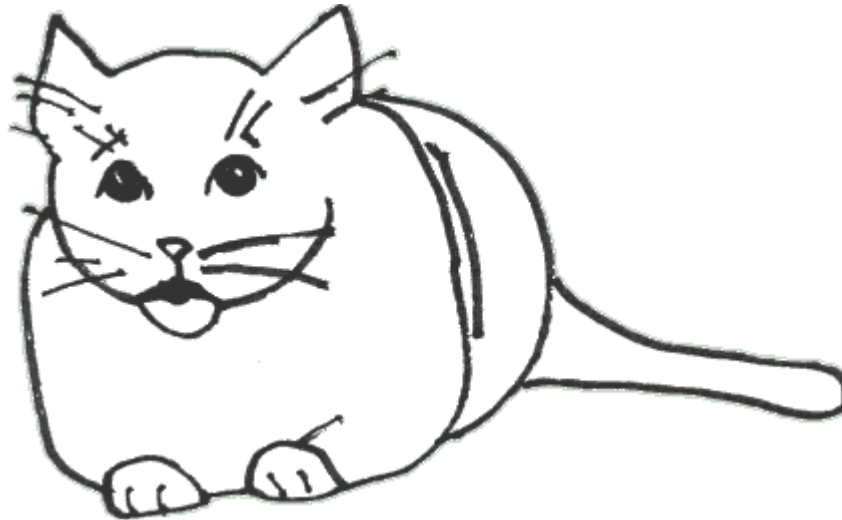


Feline Asthma



What is Asthma?

Asthma is a recurring respiratory compromise featuring constriction of the lung's airways. First, excess mucus forms, then the airway walls swell with inflammation and can actually ulcerate, and finally the airway muscles go into spasm, which leads to constriction. Airway constriction leads to inability to draw a deep breath, intolerance to exercise, coughing, and musical sighing sounds called wheezes, though not all these symptoms may be apparent at the same time. Sometimes a low-grade chronic cough is the only manifested sign but an acute asthmatic crisis can arise at any time and can represent a life-threatening event. Asthmatic airway constriction can happen spontaneously or as a type of allergic reaction. When it comes to treatment, relieving and preventing airway constriction is what it is all about.

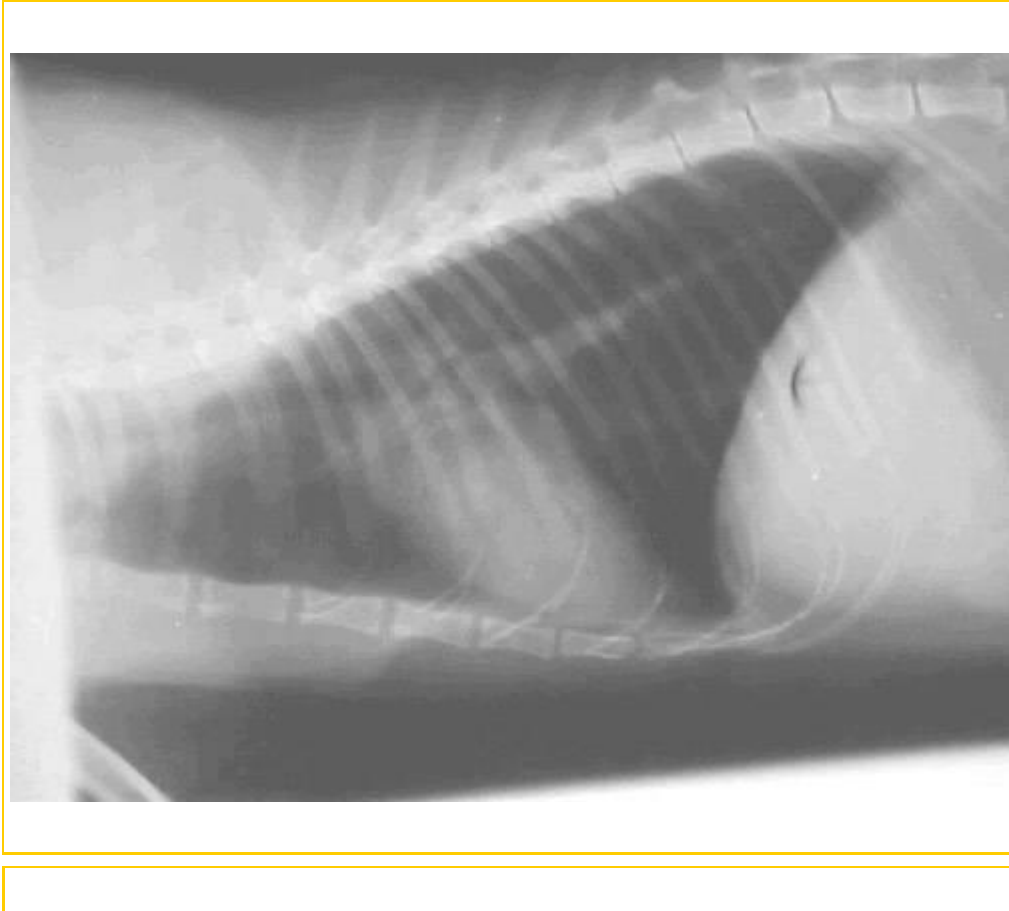
Is Feline Asthma the Same as Human Asthma?

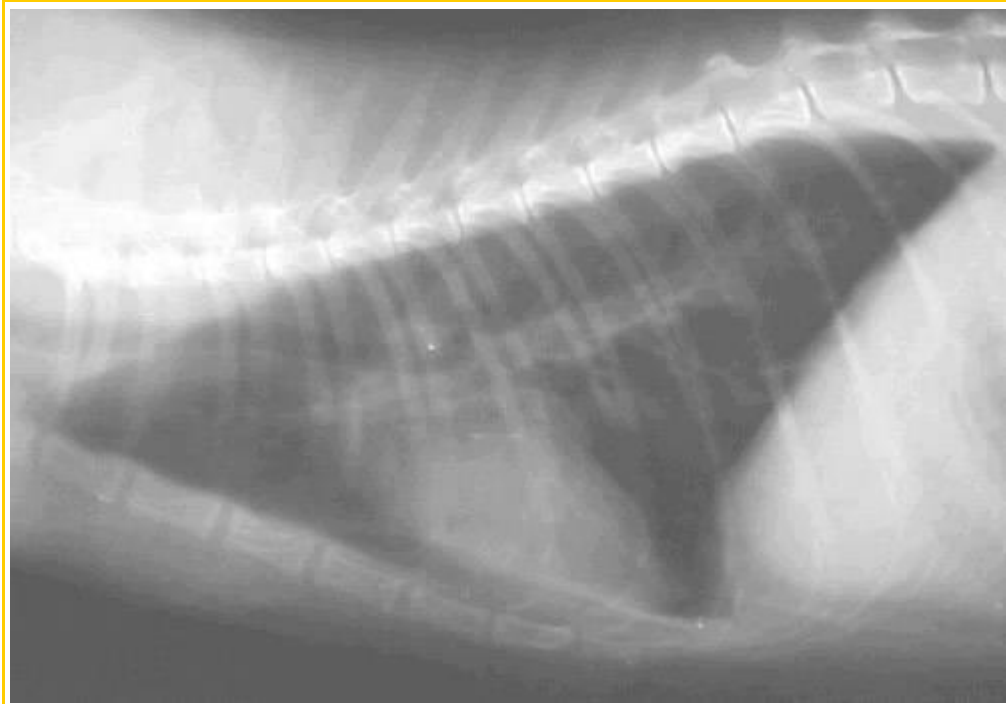
The feline condition was named asthma due to the clinical features shared with the human disease. As of this time, it appears that all the diagnostic criteria needed to make the asthma diagnosis in humans are shared by cats, yet we are still working out the mechanics of this syndrome in cats and have a great deal to learn. For example, in humans we know that while actual symptoms of asthma occur in episodes, the airways of the lung are diseased all the time. We do not know yet if feline airways are also diseased all the time or if the actual airway structural changes occur only when there are clinical signs of distress.

How is the Diagnosis Made?

Because of the constricted airways, the actual volume of air this patient can move in and out of the lungs in each breath is reduced. Often there is a great deal of effort seen in the cat's breathing. The abdomen appears to be working to push air out and the breaths are shallow and rapid. The cat may even be breathing with the mouth open in an effort to move the largest possible amount of air.

The next step toward making a diagnosis of feline asthma is the chest radiograph, assuming the cat is not in too much distress to hold still in position for this procedure. Classically, this radiograph will show asthmatic cats have what is called air-trapping. This means that the small airways have constricted to the extent that inhaled air cannot be exhaled. The lungs are larger in appearance than normal as they are over-inflated. The diaphragm may seem flattened due to this over-inflation.





Both of these radiographs are from the same patient. The top radiograph is normal. The bottom radiograph was taken during an asthma attack.

In the bottom radiograph, it is possible to view the tiny airways in much higher detail. This is partly because they are made more prominent because of the mucus and inflammatory fluid inside them (the “doughnuts” and “tramlines,” as mentioned below) and partly because they are surrounded by more air than usual (air-trapping).

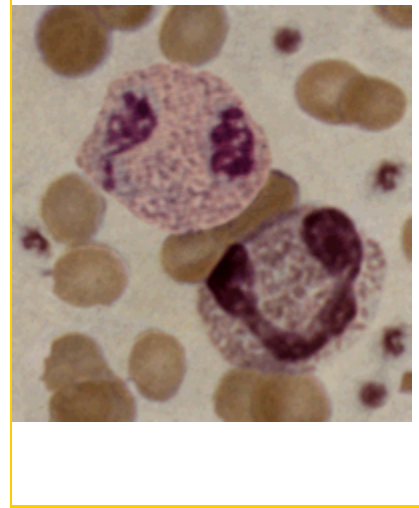
Inflammation and mucus build up within the airways, causing their walls to appear thickened in the radiograph. The terms used for such airway appearance are doughnuts (when viewing the airway end-on) or tramlines (when viewing the airway from the side). You may hear your veterinarian use these terms as they are classical findings in airway disease.

But some Asthmatic Cats have Normal Radiographs



Since visible changes are not always evident on radiographs this can lead to the diagnosis of asthma when there isn't any. Indeed, the diagnosis of asthma can be complicated and it is famously over-diagnosed because it is consistent with normal radiographs.

Procedures that retrieve cells from the lower respiratory tract may be helpful in patients with normal radiographs. Such procedures include the tracheal wash and bronchoscopy. The cell type of allergy known as the eosinophil is abundant in the secretions of an asthmatic patient. But even this finding is made complicated since eosinophils occur in normal feline respiratory secretions. Further, parasitic infections such as lungworm and [heartworm](#) also lead to eosinophil-rich respiratory secretions but hopefully other tests have been used to rule these infections out.



Response to Therapy as a Diagnostic Test

One important asthma feature is that the airway constriction it engenders is reversible. In an emergency situation, a small dose of epinephrine (adrenalin) can reverse an asthmatic crisis in as little as 15 minutes. Response to injection with an airway dilator such as terbutaline usually occurs within 30 minutes. Response to a long-acting corticosteroid injection (such as methylprednisolone acetate/DepoMedrol) generally yields a positive response within 48 hours.

Sometimes diagnostic tests leave room for question and one has to simply go with medical treatment for asthma and regard response to therapy as evidence that the diagnosis is correct. See below for list of medications commonly used in the long-term management of this problem.

Treatment Options

It is crucial to realize that the underlying problem in the airway is inflammation. Inflammation is responsible for the constriction. Corticosteroid medications have been the cornerstone of therapy to resolve inflammation. These can be given orally, by injection, or more recently via metered dose inhaler. Usually treatment is started with either an oral corticosteroid (such as [prednisone](#)) or a long-acting injection (such as DepoMedrol). These medications are relatively inexpensive and a good response to them helps confirm the diagnosis.

If the response to oral corticosteroids is good, they may be continued long term, supplemented with some of the other medications mentioned below, or used only during asthma flare-ups. Long-term corticosteroid use has some potential for [side effects](#), though feline patients tend to be resistant to these problems. If giving pills is too difficult, especially in a cat that is stressed and having some trouble breathing, a long-acting corticosteroid injection can be used periodically to control symptoms. Cats are more sensitive to potential side effects from these injections as these are much stronger than the pills. This means that injections can only be given periodically without risking development of [diabetes mellitus](#). If the cat seems to

require an injection more frequently than every other month, a metered dose inhaler should be considered (see below for details).

When using oral corticosteroids, it is important to taper the dose over time so as to find the minimum dose needed to control symptoms. If higher doses are indefinitely used, the symptoms may become resistant to steroids. This is more of a problem with the injectable steroids and manifests as a shorter and shorter interval between the need for the injection. Again, if this is seen, consider changing to an inhaled form of medication.

Are there other Treatment Options?

Other medications that might be helpful include:

Airway Dilators: Terbutaline (Brethine®) and [theophylline](#) are airway dilators commonly used in the management of asthma. It makes sense that if constriction is an important feature of this disease that eliminating constriction would be therapeutically helpful. Terbutaline is available orally or as an injectable. Some veterinarians encourage owners to keep a bottle of injectable terbutaline at home in case of a crisis and show them how to give it. If you are interested in this, let your veterinarian know. Theophylline is an oral medication usually given once a day at bedtime.

Cyproheptadine: One of the biochemicals involved in the asthma inflammation cascade is called serotonin. It is directly involved in constriction of the airways in cats. Cyproheptadine is an anti-serotonin medication with concurrent antihistamine properties. It is often used in cats who need extra help beyond their steroids or who are having problems that preclude steroid use. Side effects of cyproheptadine include increased appetite and sometimes tranquilization. Many cats are able to have their asthma managed with this medication alone and no corticosteroids at all.

Antihistamines: Histamine is an inflammatory substance released during allergic response. Histamine has been thought to be involved in the airway constriction mechanism and antihistamines are widely prescribed to asthmatic cats. Recent research, however, indicates that a certain receptor in the feline airway (called an H3) receptor leads to a dilation response to histamine instead of a constriction response. This could be why antihistamines have not been found to be of dramatic assistance in managing feline asthma. More research in this area is currently needed. Antihistamines have largely fallen out of favor compared to other medications.

Zamflurkast (Accolate): This new medication has received a lot of attention in the human medical arena. It is meant to supplement other treatments and perhaps reduce the "requirement" of steroids needed to manage asthma. It is still fairly experimental in cats but many anecdotal reports have been favorable. It is an inhibitor of chemical mediators called leukotrienes.

Cyclosporine: The use of cyclosporine in asthma is relatively new. Cyclosporine is an immunomodulator often used in organ transplant patients. It has been used occasionally in cats where adequate suppression of inflammation has not been possible with combinations of the other medications or when the cat is unable to take corticosteroids for other reasons (concurrent diabetes mellitus, infection, history of [calcium oxalate bladder stones](#), etc.) Cyclosporine should not be prohibitively

expensive since cats, being small, require relatively small doses but blood levels of cyclosporine may be periodically recommended, which increases the expense of this treatment significantly.

Don't Forget...

Minimizing irritants in the air is always helpful to an asthmatic cat.

- Do not allow cigarette smoke in the cat's environment.
- Use dustless cat litter.
- Consider non-topical insecticides. No sprays, either.
- Regularly replace air filters at home.

**IT IS IMPORTANT TO REALIZE THAT ASTHMA CAN CULMINATE
IN A RESPIRATORY CRISIS THAT CAN BECOME
LIFE-THREATENING IF IGNORED.**

**If your cat begins to breathe with an open mouth or if you see
excessive abdominal movement during respiration and
the cat is not purring, you may have an emergency situation.
Contact your veterinarian immediately.**

Asthma Inhalers for Cats?



Human asthmatics have enjoyed the benefits of portable inhalers for years. These handy devices deliver medication locally to the airways, thus minimizing drug side effects to the rest of the body while maximizing desired response. There were two problems with using these devices in cats:

- Cats cannot be told when to inhale.
- Cats tend to object strongly to the medication actuation (the spray-puff delivered by the device).

Interestingly these same problems apply to human infants with asthma and for them a device called a pediatric spacer was invented. This tubular chamber is attached to the inhaler on one end and a face mask on the other. The inhaler is actuated into the spacer and the infant simply breathes in the spacer's contents.

The discovery that the pediatric spacer could also be used for cats has solved the feline inhaler problem as well. The set up is the same as described above for young children and the cat takes 7 to 10 breaths from the face mask to be properly dosed. Corticosteroid inhalers, of which Flovent® is the most popular, are typically used twice daily long term while airway dilator inhalers such as albuterol-containing Proventil® or Ventolin® are used for flare-ups.

Cats are generally started on a combination of oral prednisone and the metered dose inhaler and gradually maintained on only the metered dose inhaler.

Pediatric equipment is generally available from most human pharmacies, however, a device created specifically for feline use can be ordered. It comes with the spacer and an appropriately sized face mask. Your veterinarian will need to prescribe the metered dose inhaler usually from a regular human pharmacy.

See or buy the Aerokat device at www.aerokat.com.

For more details including video on the use of the inhaled system we recommend visiting www.fritzthebrave.com, a website set up by one family devoted to their asthmatic cat. It has grown into a detailed instructional site for both pet owners and veterinarians interested in the details of inhalers for feline asthma treatment.