

Aspergillosis in Cats

What is aspergillosis?

Aspergillosis is an infection, growth, or allergic response caused by the *Aspergillus* fungus. *This fungus grows* on dead leaves, stored grain, compost piles, or other decaying vegetation.

"Cause serious illnesses in people or pets with a weakened immune system, underlying lung disease or asthma."

The *Aspergillus* species includes more than 150 types of mold that occur widely in the indoor and outdoor environment. *Aspergillus* is commonly found as a lacy mold that grows on foods. Although most of the molds are harmless, a few can cause serious illnesses in people or pets with a weakened immune system, underlying lung disease or asthma. *Aspergillus fumigatus* and *Aspergillus terreus* are the two most common species of *Aspergillus* to cause problems in cats.



How did my cat get aspergillosis?

Aspergillus is an "opportunistic pathogen", and usually afflicts immune suppressed animals. *Aspergillus* fungi shed microscopic spores that float in the air and are easily inhaled. Fortunately, cats have several protective mechanisms built into their bodies that help prevent infection. In the nose, these protective mechanisms include *nasal sinuses* to trap inhaled debris, the *mucus layer* that lines the nasal passages and traps debris, and the ability to sneeze, expelling inhaled debris and foreign bodies. In the remainder of the respiratory tract, the *mucus lining* of the respiratory passages traps debris that enters the airways, and tiny hair-like *cilia* that are constantly in motion 'sweep' the mucus and trapped debris up and out of the airways. A healthy immune system provides active protection of the entire body, preventing invasion and fighting infections within the body.

If *Aspergillus* spores, called *conidia*, are able to avoid these protective mechanisms and grow, they become more difficult for the body to remove. Some strains of the fungus are more pathogenic or dangerous than others, or a cat may simply be exposed to a large number of spores that overwhelm its defenses.

Aspergillosis begins when susceptible cats inhale mold spores. In some cats, the spores trigger an allergic reaction. In others, the spores cause an infection. Most infections localize in the nose, while some cats develop mild to serious lung infections. The most deadly form of aspergillosis – systemic or disseminated aspergillosis – occurs when the infection spreads beyond the lungs to other organs. Even when discovered and treated early, systemic aspergillosis is often fatal.

What does it do to a cat and what are the clinical signs?

There are two common types of Aspergillus infection in cats, nasal and systemic aspergillosis.

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Nasal aspergillosis

Nasal aspergillosis is the most commonly diagnosed form of aspergillosis in cats. Most cases of nasal aspergillosis are *invasive* meaning that the fungus destroys the delicate bones of the sinuses. The less common and less invasive forms of nasal aspergillosis create an accumulation of mucus and fungus commonly referred to as a "fungal ball" or "aspergilloma." What the pet owner observes is a chronic nasal discharge ("snotty nose") that often has a strong odor, lasts for weeks to months, does not respond to antibiotics or other common therapies and typically involves only one nostril. Nosebleeds may occur intermittently and the lower edges of the nostrils are often rough, inflamed and ulcerated (the tissue ulcerates because of the discharge, which is very irritating).

Systemic aspergillosis

In systemic aspergillosis, the fungus enters the body through the respiratory tract and travels to other organs via the bloodstream, creating a more serious generalized or systemic fungal infection.

The clinical signs of systemic aspergillosis depend on where the fungus localizes or becomes established in the body. Common sites of infection include the bones and the intervertebral discs of the spine; clinical signs include lameness, weakness, and incoordination. Many cats develop *draining tracts* (holes with pus or bloody discharge oozing out) in the areas of infection. Fever, weight loss, appetite loss, and uveitis (deep inflammation of the eye) are also commonly associated with systemic aspergillosis. Unfortunately, most cats are terminally ill by the time they exhibit clinical signs.

How is aspergillosis diagnosed?

To diagnose nasal aspergillosis, at least two of the following four criteria must be met:

- Radiographs or a CT scan (Computed Tomography is the method of choice) or MRI) show changes that are consistent with a fungal infection.
- Fungal plaques or aspergillomas are visible with rhinoscopy (a technique where a narrow needlelike camera is inserted into the nose).
- *Aspergillus* organisms are seen in or cultured from either a tissue biopsy or nasal discharge.
- A blood test is positive for antibodies against an *Aspergillus* species.

General anesthesia is necessary for diagnostic imaging (radiographs or CT scans) as well as for rhinoscopy. In many cases, the advanced equipment required to perform these tests is only available at specialty referral practices or veterinary teaching hospitals. In some cases the yellow *Aspergillus* plaques can be seen within the nasal passages without specialized diagnostic equipment.

The diagnosis of **systemic aspergillosis** can be more challenging. Patterns of bone lysis (destruction) on radiographs or a CT scan may be suggestive of fungal infection. In some cases, the draining fluid or a tissue sample may contain visible *Aspergillus* organisms. If the organism is not visible, it may be cultured from fluid or tissue sample. Ideally, there would be

a blood test to detect pathogenic species of *Aspergillus*, allowing your veterinarian to make the diagnosis non-invasively. In reality, the current test to detect *Aspergillus* antibodies does not differentiate between species of the fungus; the presence of antibodies could be the result of exposure to the numerous non-pathogenic species of *Aspergillus*. Furthermore, cats that develop systemic infections usually have a compromised immune system disease and may not even be able to produce many antibodies.

How is aspergillosis treated?

Fungal infections in general require extended treatment and many of the drugs traditionally used to treat aspergillosis have toxic side effects. Advances in techniques have enabled better success with the treatment of nasal aspergillosis, but systemic aspergillosis in cats is still challenging to treat.

Treatment of nasal aspergillosis

After anesthetizing the cat, an endotracheal tube (breathing tube) is placed in the trachea or windpipe, allowing the patient to breathe a mixture of anesthetic gases and oxygen. The area at the back of the throat is packed off with gauze sponges and an inflatable balloon catheter known as a Foley catheter. A 1% solution of clotrimazole, a topical antifungal lotion, is infused into the nose and frontal sinuses and the nostrils are sealed. The solution incubates for an hour, during which time the patient is periodically turned to ensure the solution contacts all of the surfaces of the sinuses. At the end of the incubation period, the clotrimazole is suctioned or drained out through the nostrils.

Approximately one-third of patients will require several treatments. In most cases, the nasal discharge will have resolved within 2–4 weeks. If there is still evidence of continuing infection one month after the treatment, the patient should be rechecked and another treatment should be performed.

If there is any evidence that the infection has eroded through the bones of the nasal sinuses and has entered the brain, this treatment is contraindicated and oral anti-fungal medication is required. Several months of oral therapy will be required and a 60% to 70% success rate has been reported.

Treatment of systemic aspergillosis

Treatment is particularly frustrating for systemic or disseminated aspergillosis in cats. Amphotericin B is an older anti-fungal drug, largely replaced by newer anti-fungal drugs due to its high potential to cause kidney damage. Unfortunately, many of these newer drugs are less effective against aspergillosis. To reduce the damaging side effects to the kidneys, amphotericin B has been encapsulated in liposomes (microscopic fatty envelopes) or other lipid formulations; although they have been used in humans with some success, these formulations are extremely expensive.

Long-term treatment (for months to years) with itraconazole has proven successful in some cases. Disseminated aspergillosis in humans has been treated with terbinafine and voriconazole, but there is very little research involving their use in pets.

What is the prognosis for my cat?

The prognosis is generally good for cases with localized nasal aspergillosis. The prognosis for systemic aspergillosis is guarded to poor, especially if there is evidence of sinus destruction.

Can I get aspergillosis from my cat?

Birds are the most common source of infection in humans. While the potential to contract aspergillosis from your cat exists, it is less likely if you practice good personal hygiene, especially hand washing, and avoid handling any discharges. If your cat has been diagnosed with aspergillosis, you should contact your physician for advice.

This client information sheet is based on material written by: Ernest Ward, DVM

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