

Improved diagnosis and treatment



Photo 7: This view of Ebony shows a healed pastern/coronet, and she has been reshod to allow her to begin some conditioning and work.

Pan American Veterinary Labs has developed an enzyme-linked immunosorbent assay (ELISA) that is specific for the presence of pythiosis fungal elements and has greatly helped in the recognition of these cases. A simple blood sample is evaluated, and the disease can be confirmed. This testing can also recognize the presence of *Lagenidium* (three cases in horses have been confirmed so far). "We have developed a 'vaccine' to pythiosis that can be used in confirmed cases, and this immunotherapeutic product works by helping the horse modulate the change from T2 helper to T1 helper cell response," says Glass. This product has been shown to have an almost 100 percent cure rate for acute cases (< 15 days) but is less effective in chronic cases (> 60 days). The overall rate of cure is 75 percent for all cases, strongly suggesting that early diagnosis and treatment are crucial to success (Photos 3-7).

Additionally, many clinicians attempt to debulk these large cancer-like growths if diagnosis and treatment have been delayed. This surgical tissue removal is generally associated with poorer skin healing and cosmetic appearance after infection than if the horse is allowed to heal itself slowly. This is another reason for early and proper diagnosis leading to correct treatment and perhaps lessening the need for surgical tissue removal.

"If I could emphasize one thing to veterinarians," Glass says, "it is to move pythiosis up on the diagnostic scale. If you see a horse that has a pythiosis-like lesion that does not respond to antibiotics and standard treatment in the first 10 days, you should think about pythiosis right away."

After getting a good look at these lesions, hopefully, no one will be able to forget.

Dr. Marcella is an equine practitioner in Canton, Ga.



Photo 6: After vaccine treatment, the wound on Ebony as compared to Photo 5 looks drier, flatter and less irritated. The healing outer edges of the mass look almost burnt, and the central area is no longer oozing serum.

The Daily Puppy

Sometimes called swamp cancers, species of the *Pythium* genus are parasitic water molds. Of the around 200 species of *Pythium* pathogens, *Pythium insidiosum* is the only one that causes disease in animals. The rest of these pathogens affect only plants or fish. Pythiosis is relatively rare but is becoming increasingly more common in dogs and horses. This disease is most often seen in those two animals but also affects cats, cattle, captive polar bears and humans.

Types of Pythiosis in Dogs Two types of Pythiosis affect dogs. The most serious type, canine gastrointestinal pythiosis, infects the bowel, causing it to thicken and swell. Large abdominal masses are the result of this condition, which often ends in loss of bowel tissue. The other type effects the skin of the dog and is called cutaneous pythiosis. This form causes lesions to form on the perineal area, the legs, abdomen and face. These lesions eventually turn black and rot.

Causes of Pythiosis *Pythium insidiosum* thrives in wet environments and grows fastest during rainy seasons. Dogs who drink warm standing water get the disease, but they can also catch it simply by walking through wet grass or eating wet grass. The spores enter the body through the digestive tract and through open wounds. Certain kinds of dogs are more susceptible to the disease. German shepherds, Cavalier King Charles spaniels and Labrador retrievers seem to be the most common victims, especially when young.

Symptoms of Pythiosis The symptoms of canine gastrointestinal pythiosis are quite serious and include vomiting with or without visible blood, diarrhea, blood in the stool, lethargy, appetite loss, weight loss, fever, enlarged lymph nodes and large abdominal masses. The symptoms of cutaneous pythiosis are outwardly visible and painful for the dog; they include wounds that swell, become infected with pus and don't heal. These sores are the result of abscesses in the skin that cause tissue to rot.

Treatment of Pythiosis A variety of treatments are available, the most effective being immunotherapy and antifungal medications. Surgical removal of lesions and infected tissues is effective if the entire infection is removed; otherwise, it returns. Typically, the antifungal and immunotherapy treatments immediately follow surgery to prevent the disease symptoms from recurring. The best treatment involves boosting the animal's own immune system to help him fight off the infections with immunotherapy vaccines.

References[American Kennel Club Canine Health Foundation: Pythiosis](#)[Michigan State University Biomedical Laboratory Diagnostics Program: Canine Pythiosis](#)

PYTHIOSIS (SWAMP CANCER) HORSE & LIVESTOCK OWNERS BEWARE



This was Belle, my gorgeous Appaloosa mare that died on May 10, 2015 due to a disease called Pythiosis, aka Swamp Cancer. And she contracted it from a pond in South Georgia (Dougherty County.) Pythiosis claimed Belle's life after a ten month battle. I raised Belle from day of birth to 11 years old. Belle had access to this pond for 11 years, but it only took one time to contract pythiosis. Most horse owners have never heard of pythiosis, like me, until my mare tested positive for it. She had what appeared to be a puncture wound the size of a dime on her forearm and belly that grew to 6" diameter within weeks, eventually devouring the upper leg. The lesions mimic a summer sore or pythiosis can be acquired internally from ingesting the water. This is a horrific disease and an everyday relentless battle.

There are serum shots available with chances of recovery being 70-80% if diagnosed within the first 60 days. There is not a preventative vaccine at this time. I would encourage livestock, horse and dog owners to think twice about letting their animals into any type of pond, swampy locations or low lying areas that accumulate water, especially if the animal has even the smallest wound on it. The disease in horses is becoming more common in Florida, Texas, Louisiana, Mississippi and even as far north as Michigan. Becoming more prevalent in dogs. Human cases have also been reported.

“Swamp cancer”: The increasing threat of equine pythiosis

Mar 01, 2011 By [Kenneth Marcella, DVM](#)

DVM360 MAGAZINE

Swamp cancer": The increasing threat of equine pythiosis

Know when to suspect this fungal infection so you can prevent its generally fatal consequences



Pythiosis is a relatively uncommon fungal-like infection causing cutaneous or subcutaneous, gastrointestinal, respiratory or multisystemic disease in many species of animals including humans. Horses are most commonly infected, and the devastating tumor-like nodular skin masses seen in these cases are likely to be remembered long after the actual name of the organism—*Pythium insidiosum*—is forgotten. The extremely rapid rate of growth of these lesions and the generally fatal outcome in these cases makes remembering this disease crucial for equine practitioners since early recognition and appropriate treatment are the only hope for survival for infected horses.

An increasing problem

Pythium insidiosum is referred to as an aquatic fungi or water mold, but, although it has some characteristics in common with typical molds, it is phylogenetically distinct. It was first identified in 1901 and has caused problems throughout North, Central and South America, the Caribbean Islands, Australia, the Pacific Islands and Asia. (It is interesting that tropical conditions support pythiosis, but to date no cases have been reported in Africa).

Pythiosis has been called a number of names throughout the world, from swamp cancer, Florida horse leeches and summer sores to bursatee. This lack of scientific or descriptive terminology reflects the lack of knowledge about this disease.

Recently, however, new research and better diagnostic methodologies seem to indicate that pythiosis, and infection by another member of the same class of organisms—*Lagenidium*—might be responsible for an increasing number of infections in horses and other species. Bob Glass, an allergy specialist and owner of Pan American Veterinary Labs, has been investigating pythiosis for years.

Although we've been interested in *Pythium*, *Lagenidium* and the hundreds of other related species for years, it has typically been a small number of researchers looking at a small number of confirmed cases," says Glass. "Better diagnostic tests and increased awareness have brought us many more cases and these diseases seem to be on the rise, so we are now making more rapid strides in our research." Ten years ago, Pan American Veterinary Labs recorded fewer than 10 cases of pythiosis in dogs per year. Currently, they are identifying about 20 cases per month.,

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Photo 1: A lateral view of an aggressive pythiosis lesion in a Quarter Horse mare. The initial irritation on this horse's lower chest just caudal to the elbow looked like a minor scrape or puncture and was initially treated as a nonresponding wound.

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Why the increase in infection?



Photo 3: An angry, red, ulcerated lesion can be seen on the medial RF of this horse. It has been kept under a wrap but is not responding to treatment.

Climatic changes may have as much to do with increased pythiosis cases as any other single factor. In the United States, most cases of this disease come from two states: Florida is responsible for 60 percent of recorded infections, and Texas accounts for another 25 percent. Georgia, Louisiana, Mississippi and Alabama contribute another 10 percent, so the hot, generally wet and humid south is the ideal area for pythiosis and related fungal infections.

This area has experienced various stages and degrees of drought followed by wetter weather over the last few years. In times of low rainfall, lakes, ponds and streams recede, and plant growth occurs in these previously flooded locations. When wetter conditions follow and water covers this new vegetation, the ideal situation for fungal infection is created.

"We know that pythiosis and similar organisms parasitize plants, fish, algae and crustaceans," says Glass. "These organisms produce spores that move through the water looking for new plants to invade, and when horses, dogs or humans are in that wet environment, they are at risk of becoming infected."

Such situations are essentially "dead-end infections" because *Pythium* species cannot replicate outside of a plant environment. "We know that there is no animal-to-animal transmission of pythiosis, and we are highly confident that an infected horse cannot contaminate the environment," says Glass. "Ninety-nine percent of the cases in horses are dermal infections that start with a break in the skin." This explains the much higher incidence of pythiosis in hunting dogs and horses, both of which spend a great deal of time in wet grasses, swampy or boggy locations exposed to weeds, briars and other irritative objects that can cause small lacerations on the lower limbs.



Photo 4: The same horse in Photo 3 after vaccine

Pathogenesis



Photo 5: An early red, uneven granulation bed is noted on the caudal heel and pastern of this horse, Ebony. She is slightly lame and pruritic as well.

Pythiosis typically begins as a small irritated area usually on the distal limb of a horse. This may be initially thought to be a sting, bite or small puncture, and the mild-looking lesion usually is not a cause of concern. Owners will generally begin cleaning the area and treating it with various topical antibiotic or anti-inflammatory creams. But within a few days, the lesion is markedly larger, red and irritated. It may also begin to be pruritic with the horse rubbing or even biting at the lesion.

Veterinary attention is sought at this point, and the lesion now looks more like a possible snake bite or foreign body puncture with significant reactive granulation tissue and necrosis. Radiography, ultrasonography and other diagnostic tests are unrewarding. Antibiotic and anti-inflammatory therapy is initiated at this stage, but the lesion continues to grow. It is tumor-like now, and serum freely leaks from the raw, irritated surface (Photos 1 and 2, p. 2E). Aggregates of necrotic cells form in the lesion, producing yellow to grey, pea-sized, gritty, coral-like bodies called *kunkers*. Although these structures are not specific to pythiosis, their presence is evidence enough to make one highly suspicious of fungal infection.

Histopathologic examination samples taken from the horse at this point may or may not be helpful. A report of "inflammatory response" with or without the presence of hyphal elements is usually returned. Special stains are needed to see the fungal hyphae in tissue, and even with correct staining the sensitivity is only 60 to 70 percent, so pythiosis can be missed unless fungal infection is suspected. If such an infection is suspected and antifungal therapy is started, the horse will likely still not respond. The lesion will continue to grow and eventually erode ligaments, tendons and bone and lead to death in 95 percent of cases within six months.

This rapid tissue destruction is solely the result of a massive allergic response to the presence of fungal hyphal elements on the part of the horse. T2 helper cells drive this reaction, and mast cells and eosinophils dominate the cellular population. Some horses (about 5 percent) are able to switch to a T1 helper cell response that effectively kills the organism and switches to a lymphocyte and monocyte population that promotes healing.

Glass notes that a serologic survey of hunting and retrieving dogs from at-risk areas showed that 15 to 20 percent of these animals have antibodies to *Pythium*, indicating previous exposure and successful destruction of the fungus. While no such serologic survey has been done in horses, Glass suspects similar findings, noting that it is "just not that easy for all horses to become infected with *Pythium* species since many more horses are exposed than become ill, and all the factors required for successful infection are not yet known

treatment. The lesion is much drier and not as red, moist or angry. The horse is also no longer pruritic, indicating an end to the allergic phase.