# HISTOPLASMOSIS

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<th>Animal Group(s) Affected</th>
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<td>Mammals</td>
<td>Inhalation (+/- ingestion) of microconidia from environment</td>
<td>Non-specific, reflecting organ involvement</td>
<td>Asymptomatic infection is most common but can progress to rapidly fatal illness</td>
<td>Itraconazole; Amphotericin B</td>
<td>Avoid contaminated soil (especially areas where bird feces accumulate in endemic areas)</td>
<td>Not directly but humans are infected from environment</td>
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**Fact Sheet compiled by:** Maria Spriggs  
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**Fact Sheet reviewed by:** Joe Wheat, Tiffany Wolf

**Susceptible animal groups:** Mammals, including humans; birds, because of higher body temperature, are not typically susceptible to natural infection although a single case report exists in an Eclectus parrot. Published zoo/wildlife cases include: dorcas gazelle, snow leopard, Patagonian cavy, skunk, spiny rat, two-toed sloth, nine-banded armadillo, common opossum, paca, African pygmy hedgehog, Bengal tiger, European hedgehog, sea mammals.

**Causative organism:** *Histoplasma capsulatum*

**Zoonotic potential:** No, although common-source infection of people and animals is possible

**Distribution:** Worldwide, except Antarctica. In the US, most common in region of Ohio, Missouri, and Mississippi Rivers. The organism is found commonly in soil that contains bird and bat manure as nitrogen-rich soil supports fungal growth. Bats may play role in spreading disease as they can develop chronic intestinal dissemination and shed yeast in feces.

**Incubation period:** 12-16 days

**Clinical signs:** Subclinical infection is most common.  
Pulmonary form: pneumonia, wheezes, fever, weight loss, cough, depression  
Mediastinal lymphadenitis form: hilar lymphadenopathy, cough, respiratory distress  
Progressive disseminated form: Any tissue can be involved.  
In domestic cats: fever, weight loss, anemia, interstitial lung disease, hepatomegaly, splenomegaly, and, rarely, oral and lingual ulcerations  
In domestic dogs: fever, large bowel diarrhea, intestinal blood loss, anemia, depression  
Any species: bone lesions, ocular lesions, CNS, skin nodules  
Equine abortion: mare appears healthy but placenta involved.

**Post mortem, gross, or histologic findings:**  
Pulmonary form: miliary or larger gray granulomas, may be calcified  
Disseminated form: visceral organs are generally thickened, gastrointestinal mucosa hemorrhagic, enlarged liver with variegated pale pattern, lymphadenopathy  
*Histoplasma* organisms are usually numerous in granulomas and infected tissue.

**Diagnosis:**  
Clinical pathology: Non-regenerative anemia, thrombocytopenia, might visualize organism in cells on buffy coat smear.  
Radiography: diffuse interstitial, miliary or nodular infiltrates, hilar lymphadenopathy (dogs>cats), rarely osseous lesions are present and when present, they are more typical in distal limbs.
**HISTOPLASMOSIS**

Cytology/histopathology: Diagnosis can be made by FNA/cytology, especially rectal scrapings, or abnormal fluids and tissues. With tissue biopsy, organisms are difficult to detect with routine H&E stain, but stain well with PAS, Gomori’s methenamine silver, and Gridley’s fungal stains. Yeast forms in macrophages and giant cells are round to ovoid structures with thin cell wall and a thin, clear zone between the cell wall and cellular cytoplasm. Culture: lung, skin lesions, or bone marrow give highest yield in disseminated cases

Antigen detection: greatest sensitivity when test both urine and serum, and CSF in CNS cases

Serology: variably reliable, but may be useful in mild cases with negative antigen results

Molecular: PCR not well established, high rate of false negatives in published studies

**Material required for laboratory analysis:** Serum, urine, tissue or fluid sample for cytology/histopath/culture

**Relevant diagnostic laboratories:**
MiraVista Diagnostics for antigen testing www.miravistalabs.com (also does azole levels)
Many state and university labs run serology including Cornell, Kansas State

**Treatment:** Infection can be self-limiting and resolve without treatment, but treatment is recommended. Itraconazole or amphotericin B traditionally is drug of choice. However, fluconazole may be better for ocular or CNS involvement. Posaconazole and voriconazole are newer and effective drugs, but are expensive, and have little information in vet medicine literature. Treatment interval is 4-6 months and at least 1 month after resolution of clinical signs and after antigen concentrations are negative or below 2 ng/mL.

**Prevention and control:** Avoid contaminated soil.

**Suggested disinfectant for housing facilities:** The only proven disinfectant is 3% formalin.

If an accumulation of bird or bat manure is discovered in a building, removing the material by hand/broom/shovel is NOT always the best. Leaving the material alone with signs to warn of health risk may be best course of action. Truck-mounted or trailer-mounted vacuum systems are recommended for buildings with large accumulations to reduce risk of dust exposure. It is recommended to use a vendor experienced in removal of infectious materials.


**Notification:** None required

**Measures required under the Animal Disease Surveillance Plan:** None

**Measures required for introducing animals to infected animal:** Direct transmission from infected animal to human or other animal is unlikely because yeast phase is not as infectious as mycelial phase.

**Conditions for restoring disease-free status after an outbreak:** N/A

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**References:**


