

# HISTOPLASMOSIS

## ***What is histoplasmosis?***

Histoplasmosis is an infectious disease caused by inhaling spores of a fungus called *Histoplasma capsulatum*. Histoplasmosis is not contagious; it cannot be transmitted from an infected person or animal to someone else.

## ***What are the symptoms of histoplasmosis?***

Histoplasmosis primarily affects a person's lungs, and its symptoms vary greatly. The vast majority of infected people are asymptomatic (have no apparent ill effects) or they experience symptoms so mild they do not seek medical attention. If symptoms do occur, they will usually start within 3 to 17 days after exposure, with an average of 10 days. Histoplasmosis can appear as a mild, flu-like respiratory illness and has a combination of symptoms, including malaise (a general ill feeling), fever, chest pain, dry or nonproductive cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness. A chest X-ray of a person with acute pulmonary histoplasmosis will commonly show a patchy pneumonitis, which eventually calcifies. Chronic lung disease due to histoplasmosis resembles tuberculosis and can worsen over months or years. The most severe and rare form of this disease is disseminated histoplasmosis, which involves spreading of the fungus to other organs outside the lungs.

## ***Who can get histoplasmosis?***

Anyone working at a job or present near activities where material contaminated with *H. capsulatum* becomes airborne can develop histoplasmosis if enough spores are inhaled. After an exposure, how ill a person becomes varies greatly and most likely depends on the number of spores inhaled and a person's age and susceptibility to the disease. The number of inhaled spores needed to cause disease is unknown. Children younger than 2 years of age, persons with compromised immune systems, and

older persons, in particular those with underlying illnesses such as diabetes and chronic lung disease, are at increased risk for developing symptomatic histoplasmosis.

People with weakened immune systems are at greatest risk for developing severe and disseminated histoplasmosis. Included in this high-risk group are persons with AIDS or cancer and persons receiving cancer chemotherapy; high-dose, long-term steroid therapy; or other immuno-suppressive drugs.

Before 2000, a person could learn from a histoplasmin skin test whether he or she had been previously infected by *H. capsulatum*. However, the manufacturing of histoplasmin was discontinued in 2000, and the skin testing reagents were still unavailable in 2004. A previous infection can provide partial immunity to reinfection. Since a positive skin test does not mean that a person is completely immune to reinfection, appropriate exposure precautions should be taken regardless of a worker's past skin-test status whenever disturbances of materials that might be contaminated with *H. capsulatum* occur.

## ***What is the treatment for histoplasmosis?***

Mild cases of histoplasmosis are usually resolved without treatment. For severe cases, special antifungal medications are needed to arrest the disease. Disseminated histoplasmosis is fatal if untreated, but death can also occur in some patients even when medical treatment is received.

## ***Where are *H. capsulatum* spores found?***

*H. capsulatum* grows in soils throughout the world. In the United States, the fungus is endemic (more prevalent) and the proportion of people infected by *H. capsulatum* is higher in central and eastern states, especially along the Ohio and Mississippi River valleys. The fungus seems to grow best in soils having a high nitrogen content, especially

those enriched with bat droppings or bird manure. Disturbances of contaminated material cause small *H. capsulatum* spores to become airborne or aerosolized. Once airborne, spores can easily be carried by wind currents over long distances.

### ***How can someone know if soil or droppings are contaminated with *H. capsulatum* spores?***

To learn whether soil or droppings are contaminated with *H. capsulatum* spores, samples must be collected and cultured. Presently, the method used to isolate *H. capsulatum* is expensive and requires several weeks to complete. If not enough samples are collected, small but highly contaminated areas can be overlooked. Until a less expensive and more rapid method is available, testing samples for *H. capsulatum* will continue to be impractical for most situations. Consequently, when thorough testing is not done, the safest approach is to assume soil in endemic regions and any accumulations of bat droppings or bird manure are contaminated with *H. capsulatum* and take appropriate exposure precautions.

### ***What jobs and activities have risks for exposure to *H. capsulatum* spores?***

Below is a partial list of occupations and hobbies with risks for exposure to *H. capsulatum* spores. Appropriate exposure precautions should be taken by these people and others whenever contaminated soil, bat droppings, or bird manure is disturbed.

- ◆ Bridge inspector or painter
- ◆ Chimney cleaner
- ◆ Construction worker
- ◆ Demolition worker
- ◆ Farmer
- ◆ Gardener
- ◆ Heating and air-conditioning system installer or service person
- ◆ Microbiology laboratory worker
- ◆ Pest control worker
- ◆ Restorer of historic or abandoned buildings
- ◆ Roofer
- ◆ Spelunker (cave explorer)

### ***How can exposure to *H. capsulatum* be controlled and histoplasmosis prevented?***

The best way to prevent exposures to *H. capsulatum* spores is to avoid situations where material that might be contaminated can become aerosolized and subsequently inhaled. This is especially important for persons with weakened immune systems.

Dust suppression methods, such as carefully wetting with a water spray, may be useful for reducing the amount of material aerosolized during an activity. For some activities, such as removing an accumulation of bat droppings or bird manure from an enclosed place such as an attic, wearing a NIOSH-approved respirator and other items of personal protective equipment may be needed to further reduce the risk of *H. capsulatum* exposure. However, only persons trained in the proper selection and use of personal protective equipment should undertake work where this equipment is needed.

Disinfectants have occasionally been used to treat soil and accumulated bat manure when removal was impractical or as a precaution before a removal process was started. There is no product or chemical that is registered by the EPA that has the specific claim of being effective against *H. capsulatum*. A manufacturer of a product claiming to disinfect soil contaminated with *H. capsulatum* will have to meet the EPA's regulatory requirements and complete the registration process.

### ***Where can I get more information about histoplasmosis?***

This histoplasmosis fact sheet was prepared by the National Institute for Occupational Safety and Health (NIOSH) and the National Center for Infectious Diseases (NCID), both of the Centers for Disease Control and Prevention. For answers to other questions about histoplasmosis or histoplasmin skin-testing, please contact your physician, your local health department, or NCID in Atlanta, Georgia. NCID's Internet address is <http://www.cdc.gov/ncidod/>. For other questions about worker health and safety precautions during disturbances of soil, bat droppings, or bird manure that might be contaminated with *H. capsulatum* spores, call NIOSH in Cincinnati, Ohio, at (800) 356-4674.