

Histoplasmosis Training

Angel Carter, RN, BSN

2025



Kentucky Department for Public Health

Mission and Vision in Action

Healthier People,
Healthier Communities.

Our mission is to improve the health and safety of people in Kentucky through prevention, promotion and protection.

Prevention

- Diabetes Prevention
- Disease Surveillance
- Environmental Inspections
- HANDS

Promotion

- Immunizations
- KEIS
- Mobile Harm Reduction
- Newborn Screening

Protection


- Prescription Assistance
- Public Health Disaster Preparedness
- Smoking Cessation
- WIC


Clinical Description

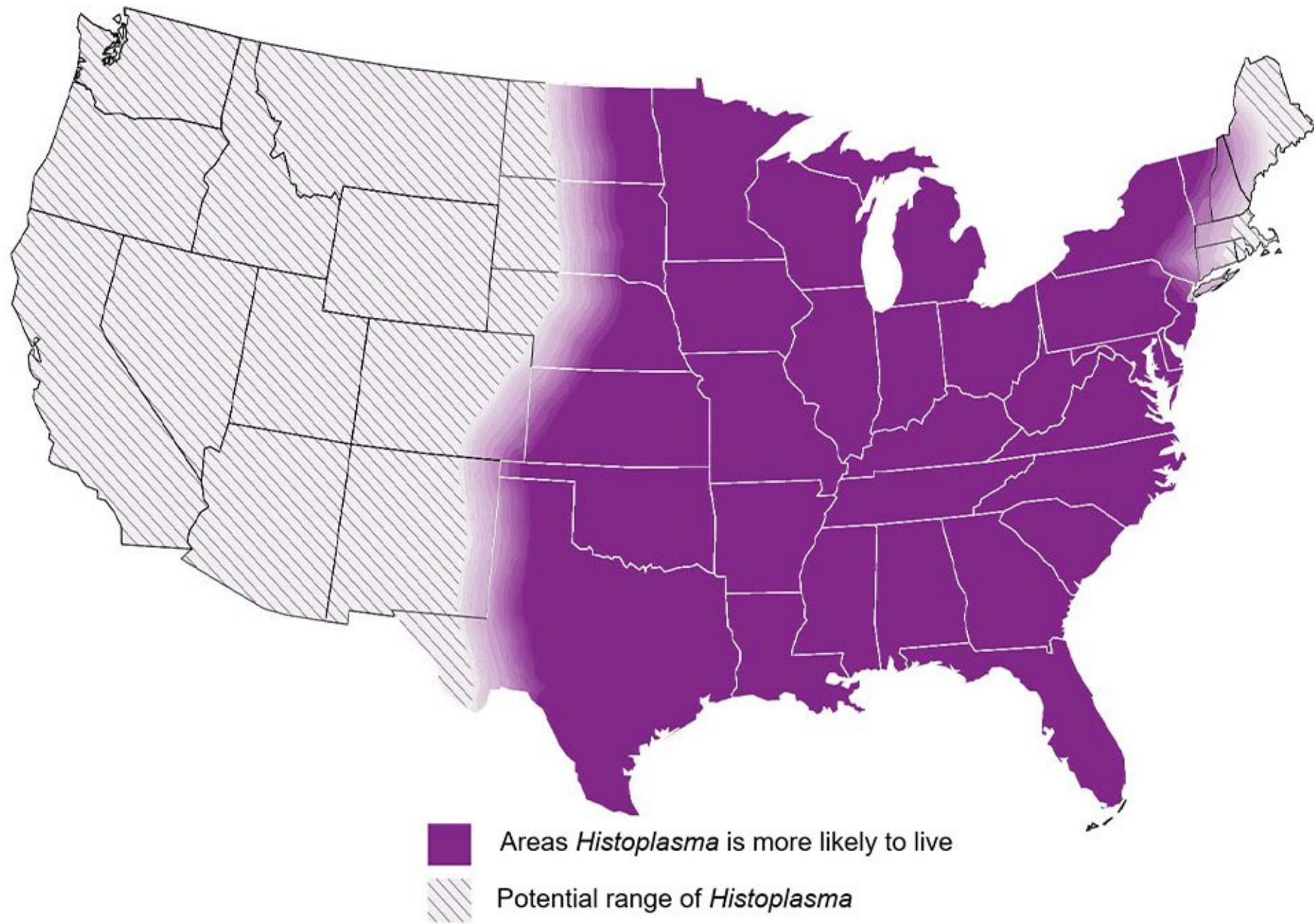
- 🛡️ Histoplasmosis is one of the most common endemic mycosis in the United States
- 🛡️ Histoplasmosis encompasses a spectrum of disease ranging from self-limited respiratory illness to disseminated infection.
- 🛡️ In the United States, histoplasmosis is caused primarily by *Histoplasma capsulatum* var. capsulatum and is endemic in the Ohio and Mississippi River valleys as well as other areas.
- 🛡️ Histoplasmosis is typically acquired through inhalation of spores found in soil contaminated with bird or bat droppings.
- 🛡️ No direct human-to-human transmission has been reported. Symptoms generally develop 3–14 days after exposure, although many infections are asymptomatic.
- 🛡️ **Several** laboratory methods are available for diagnosis of histoplasmosis, including culture, histopathology, and antigen, antibody, and nucleic acid testing.

<https://ndc.services.cdc.gov/case-definitions/histoplasmosis-2017/>

Continued...

 Most of the time when people breathe in the fungal spores, they do not get sick. However, Histoplasmosis can cause mild to life-threatening symptoms of pneumonia. Histoplasmosis is often misdiagnosed or diagnosed late because the symptoms are similar to more common pneumonias caused by bacteria or viruses.







 Histoplasmosis can develop into a long-term lung infection, specifically among people with weakened immune systems. In rare cases, it can spread to other parts of the body, including the brain and spinal cord (meningitis).





Symptoms

- 🛡️ Acute pulmonary histoplasmosis is the most common form of disease, and symptoms typically include fever, headache, malaise, and cough.
- 🛡️ Chills
- 🛡️ Fatigue (extreme tiredness)
- 🛡️ Chest Pain
- 🛡️ Body Aches
- 🛡️ Shortness of breath
- 🛡️ Erythema nodosum/erythema multiforme rash
- 🛡️ These symptoms usually appear 3 to 17 days after breathing in the fungus.







Symptoms of Disseminated disease

-  gastrointestinal ulcerations or masses
-  Skin or mucosal lesions
-  Peripheral lymphadenopathy
-  Pancytopenia, evidenced of bone marrow involvement
-  Enlargement of the liver, spleen, or abdominal lymph nodes
-  Meningitis, encephalitis, or focal brain lesion



Testing and Diagnosis

-  Healthcare providers diagnose histoplasmosis by collecting a sample of blood or urine for laboratory testing.
-  Additional testing may include:
 - Imaging tests like an X-ray or CT scan of the lungs.
 - Testing fluid from the lung or respiratory tract.
 - Testing a biopsy (small piece of infected tissues from the body)





Who is at Risk?

-  Certain groups of people are at higher risk for getting histoplasmosis and for more severe infections, including people who:
-  Have HIV/AIDS
-  Received an organ transplant
-  Take Medications such as corticosteroids or TNF-inhibitors
-  Are exposed to large amounts of the fungus such as:
 - Outdoor workers
 - Construction workers
 - Farmers, especially if handling or cleaning up after chickens.
-  Adults over the age of 55 and infants are more at risk for histoplasmosis.

Re-infection

-  It is possible to become infected histoplasmosis more than once, second infection is usually milder.
-  People with weakened immune systems may not fully fight off histoplasmosis after their first infection, even if they feel better. It can remain hidden in the body for months or years, later causing symptoms again.

Prevention Tips

-  We won't always be able to avoid exposure where it is common in the environment, but there are still some ways to reduce exposure.
-  Be aware of exposure to bird and bat droppings. limiting activities that disturb soil or increase exposure to plant matter. Preferably have these cleaned up by professional companies that specialize in waste removal.
-  Other potential exposure. Cleaning, remodeling, tearing down old buildings, landscaping and farming, gardening and yard work.
-  None of these activities are bad! Or avoidable for most people. But if someone gets sick, these activities are a flag for the cause of histoplasmosis infection.

Lab Criteria for Diagnosis, confirmatory lab criteria:

- 🛡️ Culture of *H. capsulatum* from a clinical specimen,
- 🛡️ Identification of characteristic *H. capsulatum* yeast in tissue or sterile body fluid by histopathology,
- 🛡️ ≥ 4 -fold rise in *H. capsulatum* serum complement fixation antibody titers taken at least 2 weeks apart,
- 🛡️ Detection in serum of H band by *H. capsulatum* immunodiffusion antibody test,
- 🛡️ Detection in serum of M band by *H. capsulatum* immunodiffusion antibody test after a documented lack of M band on a previous test (i.e., seroconversion),
- 🛡️ Demonstration of *H. capsulatum*-specific nucleic acid in a clinical specimen using a validated assay (i.e., polymerase chain reaction (PCR))



Non-confirmatory lab criteria:

- 🛡️ Identification of characteristic *H. capsulatum* yeast in tissue or sterile body fluid by cytopathology,
- 🛡️ Detection in serum or cerebrospinal fluid (CSF) of *H. capsulatum* antibodies by single complement fixation titer of 1:32 or greater (e.g., 1:64),
- 🛡️ Detection in serum or cerebrospinal fluid (CSF) of M band by *H. capsulatum* immunodiffusion antibody test without a previous negative test
- 🛡️ Detection of *H. capsulatum* antigen in serum, urine, or other body fluid by an enzyme immunoassay test.

Working Cases in NEDSS: The Labs

interpreting lab results can be difficult due to the variety of different labs.
Best practice: Click into the lab result to view the detailed ELR

First, let us view labs we frequently see that do not meet case definition...

Date Received	Reporting Facility/Provider	Date Collected	Test Results	Program Area	Event ID
10/16/2023 11:18 AM 	Reporting Facility: STEFlorence Ordering Provider: YAMIL MICHELEN ALVAREZ	10/10/2023	HISTOPLASMA CAPSULATUM MYCELIAL PHASE AB: <1:8 - (Final) Reference Range: (<1:8) - (Final) HISTOPLASMA CAPSULATUM YEAST PHASE AB: 1:16 - (Final) Reference Range: (<1:8) - (Final)	GCD	OBS94172325KY01
10/16/2023 11:27 AM 	Reporting Facility: ARUP LABORATORIES Ordering Provider: YAMIL MICHELEN ALVAREZ	10/10/2023	HISTOPLASMA CAPSULATUM YEAST PHASE AB: 1:16 Reference Range: (<1:8) - (Final)	GCD	OBS94176692KY01

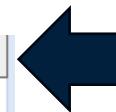
The minimum requirement for this Ab titer to meet case definition would be a result of 1:32 or greater. You **DO NOT** need to create a case for labs that do not meet case definition. Keep the labs in patient's profile in NEDDS. May have other histoplasmosis labs that come in later, its always nice to have a comparison.






Date Received	Reporting Facility/Provider	Date Collected	Test Results
01/23/2025 10:37 PM E	Reporting Facility: ARUP LABORATORIES Ordering Provider: MD ROBERT LENTZ	01/17/2025	Histoplasma capsulatum Ab [Presence] in Serum by Immune diffusion (ID): Detected Reference Range: (Not Detected) - (Final)
01/23/2025 10:41 PM E	Reporting Facility: ARUP LABORATORIES Ordering Provider: MD ROBERT LENTZ	01/17/2025	Histoplasma capsulatum mycelial phase Ab [Titer] in Serum by Complement fixation: 1:32 Reference Range: (<1:8) - (Final)
01/23/2025 10:41 PM E	Reporting Facility: ARUP LABORATORIES Ordering Provider: MD ROBERT LENTZ	01/17/2025	Histoplasma capsulatum yeast phase Ab [Titer] in Serum by Complement fixation: 1:64 Reference Range: (<1:8) - (Final)
01/23/2025 10:41 PM E	Reporting Facility: ARUP LABORATORIES Ordering Provider: MD ROBERT LENTZ	01/17/2025	Histoplasma capsulatum Ab [Presence] in Serum by Immune diffusion (ID): Detected Reference Range: (Not Detected) - (Final)

Another example. Two of these meet non-confirmatory lab criteria, the two in the center done by complement fixation (CF). The other two are not immediately clear which category they fall under. These, you will have to click on the “date received”, to go into the lab report and look at the result. So, clicking on the first one, you would then be taken to a different page, and scrolling down would see this box below, and see the results comment box, which shows this meets confirmatory lab criteria. Checking the lab this way is the best way to determine case status!

	Resulted Test	Coded Result / Organism Name	Numeric Result	Units	Text Result	Ref Range From	Ref Range To	Status	Result Comments
	H capsul Ab Ser QI ID	Detected				Not Detected		Final	M and H bands were detected, suggesting active histoplasmosis.



More Lab Talk

-  Reading the lab is very important to determining case status. It needs to specifically say what is on the case definition.
-  If the result is not clear as to what category it falls under, either non-confirmatory or confirmatory, then make sure to click in the lab and try to find the answer there.
-  If you received a EPID 200 on the patient, the lab it usually on there too and easy to see.

New vs. Existing cases

- 🛡️ To minimize duplicate counting of chronic infections and missed repeat acute infections, persons should be counted no more than once every 24 months.
- 🛡️ When working a case, always check what other labs, besides histo, a person may have.
- 🛡️ different fungal infection, such as blastomycosis or coccidioidomycosis, and meeting only non-confirmatory laboratory criteria for histoplasmosis should not be counted as a case of histoplasmosis since other fungal infections can cause false positive *H. capsulatum* antigen and antibody test results.




After Determining Lab status

Enter case-patient info into NEDSS



- 🛡️ -Enter all clinical data in appropriate fields. Ensure all signs and symptoms are entered. Clinical documentation should be added under the “supplemental info” tab, under attachments. Enter symptoms and any clinical data that helps case meet case definition under the “case info” tab, all the way at the bottom under comments.
- 🛡️ After viewing clinical data, please try to reach out to the patient to obtain exposure history.
- 🛡️ The histoplasmosis interview form can be found under the EP teams group, or on the P drive. **Always** feel free to reach out to me (angel.carter@ky.gov) if you cannot find it!
- 🛡️ If information is not known, please enter “Unknown” rather than leaving a question unanswered/blank.
- 🛡️ If case is lost to follow up, document attempts to contact and note that case is lost to follow up.

Continued...

Case finding

-  Throughout the investigation, look for symptoms of the disease in other exposed individuals.
-  Refer symptomatic individuals to healthcare provider for evaluation.
-  If two or more cases are found that are epidemiologically linked, report as an outbreak.

Outbreak

-  Notify RDS to obtain an outbreak tracking number.
-  Additional interventions or questionnaires may be required during an outbreak. Contact your regional epidemiologist or RDS if you have questions regarding this requirement

Resources You Can use to also help in Understanding histoplasmosis and how to walk through case investigation

- Case def
- RDDR
- Interview Form
- Redbook
- CCD reference

All of these may be found in the teams reportable disease files, or the P drive if you have access. Always feel free to reach out to me as well! angel.carter@ky.gov

Helpful Links

 <https://www.cdc.gov/histoplasmosis/about/index.html>

 <https://ndc.services.cdc.gov/case-definitions/histoplasmosis-2017/>

 **Link for RDDR** <reportablediseasesdeskreference4272007.pdf>

 **Redbook Link**

<https://online.statref.com/document/EVqg57D-8WxARUfa9ZT1rN>

 **CCDM link** <https://ccdm.aphapublications.org/doi/10.2105/CCDM.2745.078>