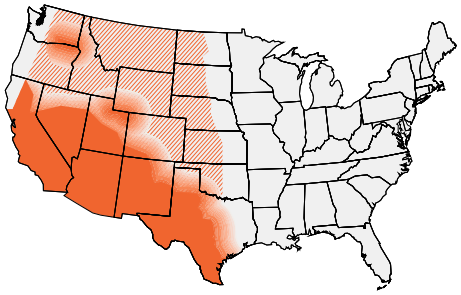
Community-Acquired Pneumonia (CAP) When to Think Fungus: Coccidioidomycosis

Accessible version: https://www.cdc.gov/fungal/diseases/coccidioidomycosis/diagnosticalgorithms

Patient living in or having traveled to a disease-endemic area



Areas *Coccidioides* is more likely to live

Potential range of *Coccidioides*

These maps are approximations. *Coccidioides* is not distributed evenly and may not be present everywhere within the shaded areas. It may also be present outside of the areas indicated.

CAP of unknown etiology not responding to a course of empiric antibiotics

OR

Initial presentation of CAP (or erythema nodosum in the setting of recent respiratory symptoms) if people have:

- Lived in or traveled to the highly endemic desert regions of Arizona (i.e., South-Central Arizona) or the San Joaquin Valley of California OR
- A link to a known coccidioidomycosis outbreak

Consider serologic testing by enzyme immunoassay (EIA) with immunodiffusion (ID) and complement fixation (CF)*

IgM (+) or IgG (+)

Pulmonary coccidioidomycosis†

IgM (-) and IgG (-)
No infection OR immunosuppressed OR false negative§

If high degree of suspicion remains, progression of illness, or recent symptom onset

Consider alternative diagnoses

Repeat serology 2–6 weeks later

Consider consulting infectious diseases or pulmonology

Positive

* Initial testing with EIA or ID and CF may depend on availability and performance characteristics of test at facility

† If an EIA test is positive, clinicians can consider follow-up testing with ID and CF to further establish the diagnosis. If ID and CF are negative after a positive EIA test, clinicians can consider repeat ID and CF 2-4 weeks later to confirm diagnosis. Patients with positive EIA results in highly endemic areas or with highly suggestive clinical findings (e.g., erythema nodosa), clinicians might start management for pulmonary coccidioidomycosis while awaiting results from ID or CF.

§ False-negative results are possible. If clinical suspicion for coccidioidomycosis continues and if the patient is immunosuppressed or clinical illness is progressing rapidly, consider microscopy and culture of respiratory specimens from a bronchoscopy. Polymerase chain reaction (PCR) and antigen detection can also be helpful but are done less frequently.

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Test	Sensitivity	Specificity	Population studied
Antibody tests			
EIA (IgM & IgG) antibody[7–9]	59%–88%	68%–96% (Cross reacts with other dimorphic fungi)	General patient population, immunocompromised population, patients with disseminated disease
Complement fixation (CF) antibody[7,10,11]	65%–83%	High	General patient population, immunocompromised population, patients with disseminated disease
Immunodiffusion (ID) antibody[7]	60%	99%	General patient population, immunocompromised population, patients with disseminated disease
Lateral flow assay (LFA) antibody[12]	31%	92%	General patient population
Antigen tests			
EIA urine antigen[15,16]	37%–71%	High (but does cross-react with other dimorphic fungi)	General patient population, immunocompromised population, patients with disseminated disease
EIA serum antigen[16,17]	51%–73%	High (but does cross-react with other dimorphic fungi)	General patient population, immunocompromised population, patients with disseminated disease
Other tests			
Histopathology[5]	23%–84%	High	General patient population, patients with diabetes, patients with disseminated disease
Cytology[5]	15%–75%	High	General patient population, patients with diabetes, patients with disseminated disease
PCR[13,14]	56%–75%	99%–100%	General patient population