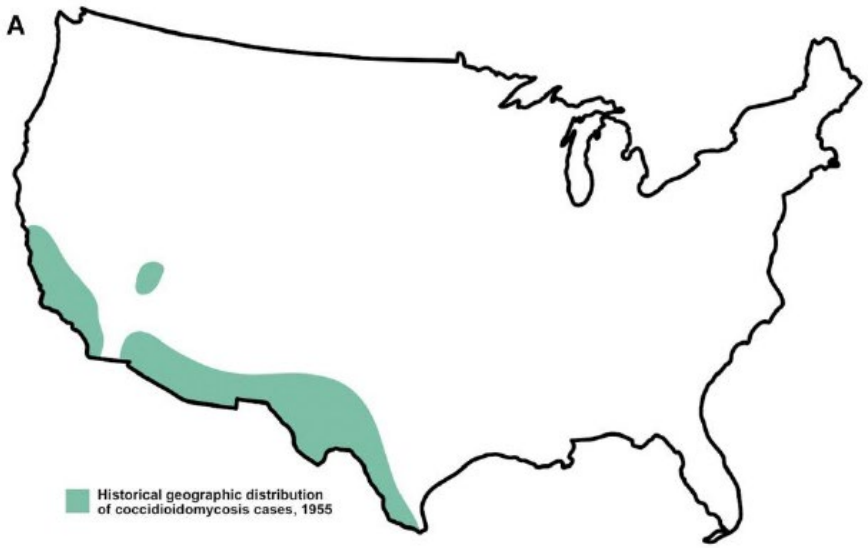
Coccidioidomycosis

3/12/25

Coccidioides – The Organism

Map of Coccidioides Distribution

- Spec *et al* published a retrospective paper on the distribution of dimorphic fungi
- Overall increase in dimorphic fungi outside of historical distribution pattern
- Recommend increased clinical suspicion in diagnosis

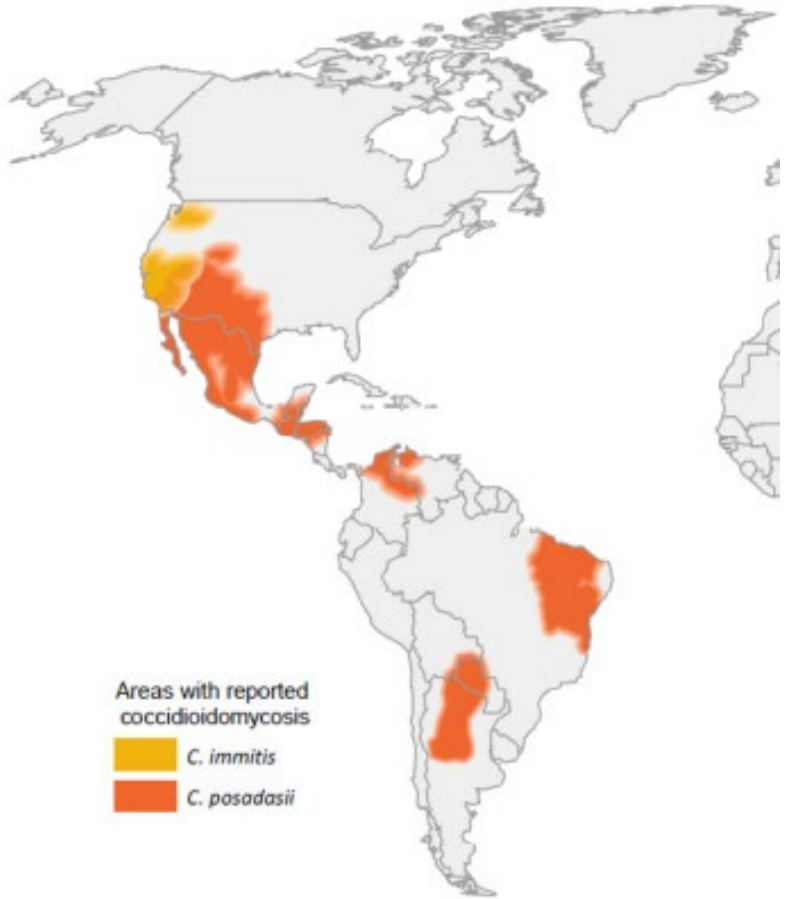


The Two Species

- Originally discovered in 1892 by Alejandro Posadas in Argentina

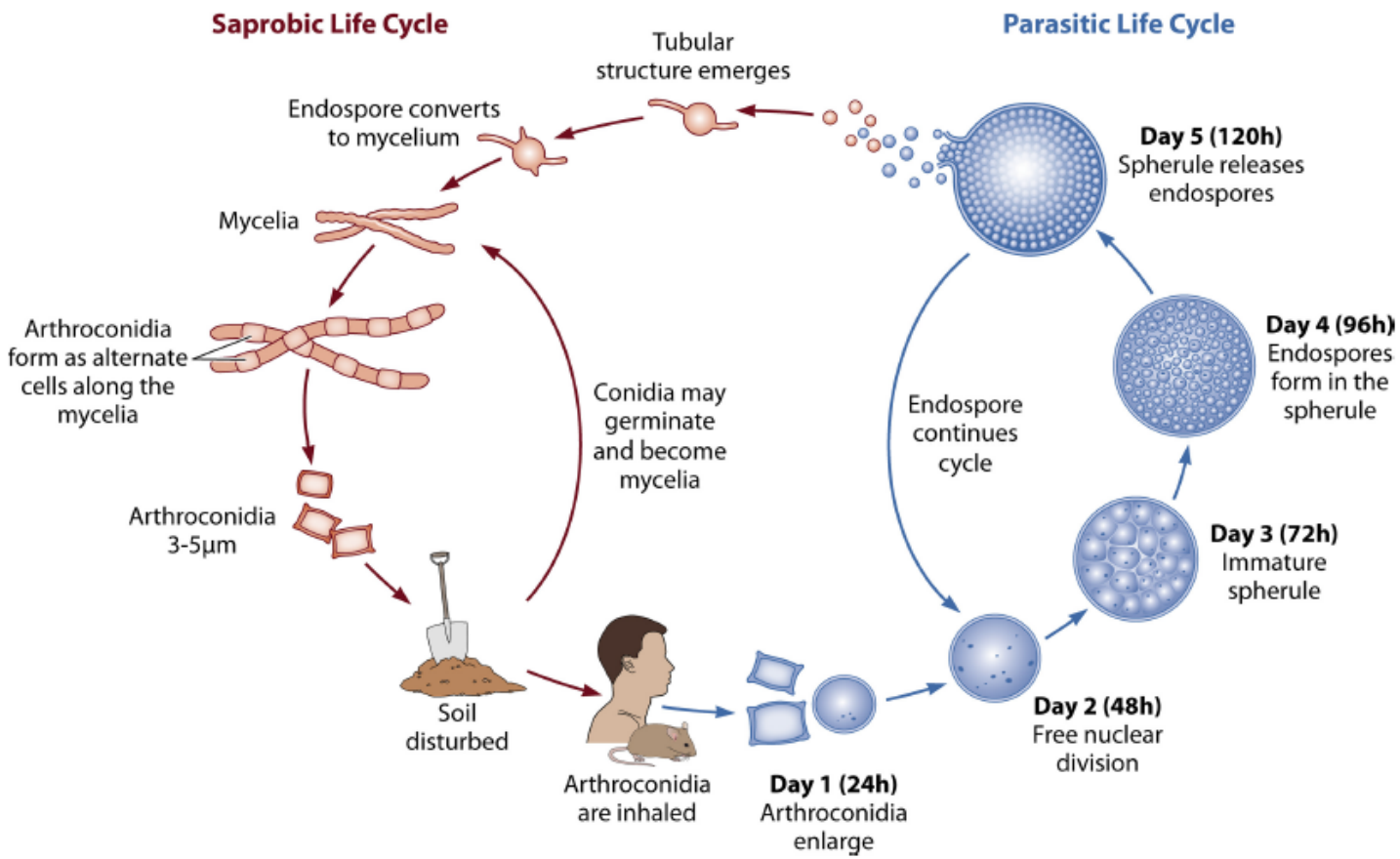
- *Coccidioides immitis* naming came from a description of disseminated disease in late 1893 California

- Eventually identified as 2 distinct species with similar disease presentation but different geographic distribution
  - *C. posadasii*
    - Arizona, Utah, New Mexico, Texas, Mexico, Central/South America
  - *C. immitis*
    - California, Washington, Baja California, Utah, some of Arizona



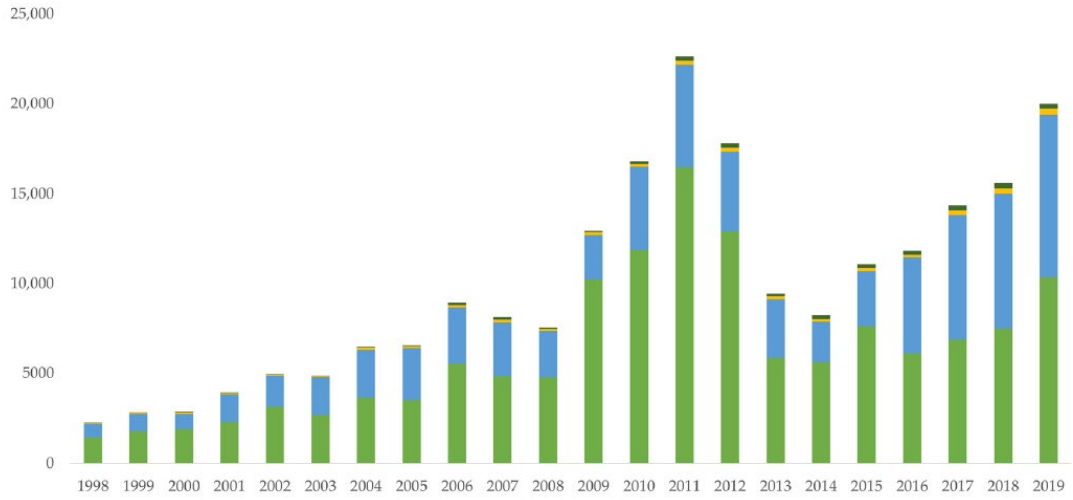
Infect Dis Ther (2022) 11:713–742

Life Cycle and Mycology



Epidemiology

- CDC estimates about 400,000-500,000 infected annually
- 1/2 to 1/3 of cases are subclinical
- Within endemic areas, 17-29% of community-acquired pneumonia diagnoses are coccidioidomycosis
- Arizona and California account for 95% of reported cases
  - ~60% or more of all coccidioidomycosis cases in the U.S. occur in Arizona and ~ 30% in California

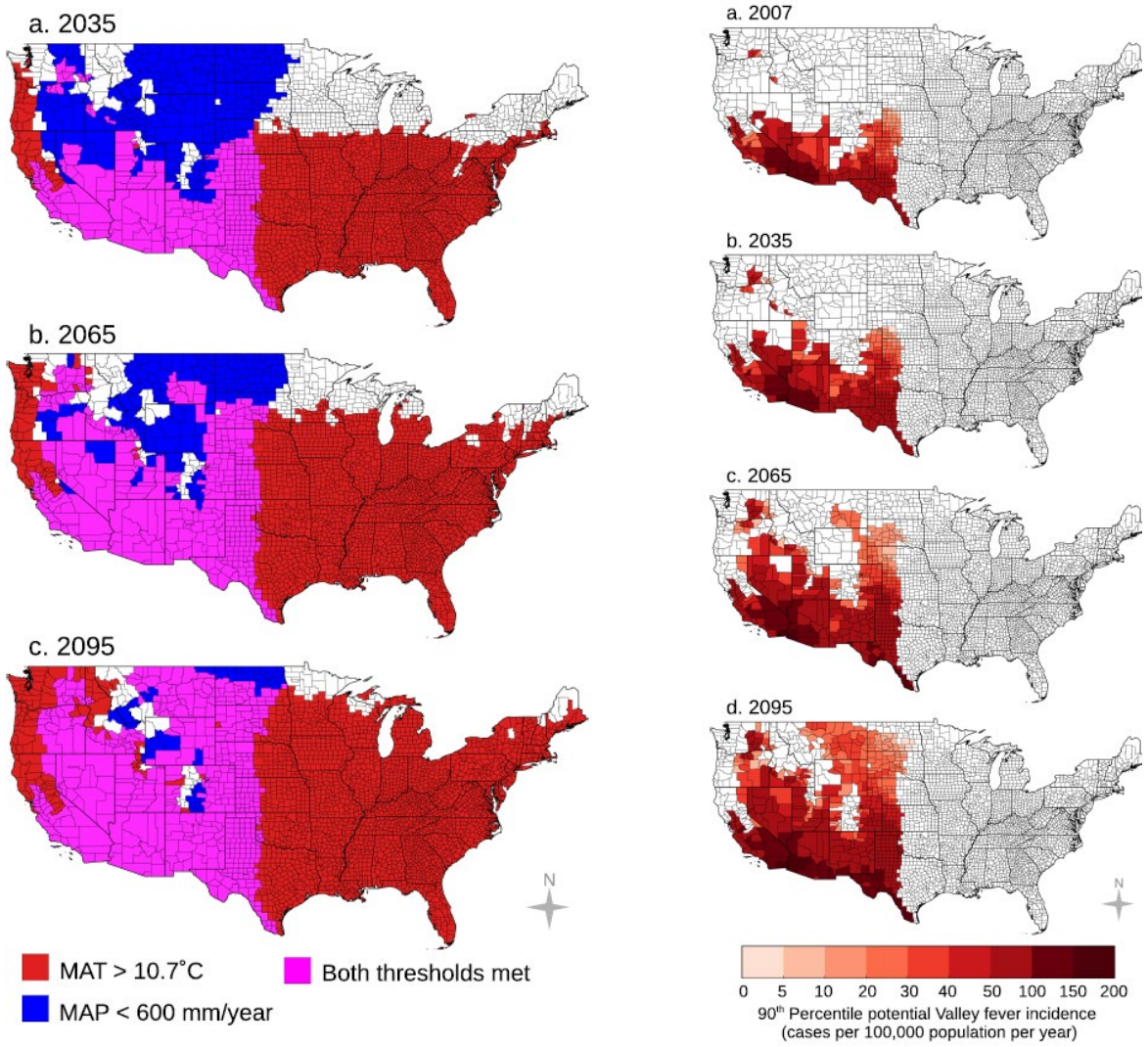


https://doi.org/10.3390/ jof8070666

Climate Change and Coccidioidomycosis

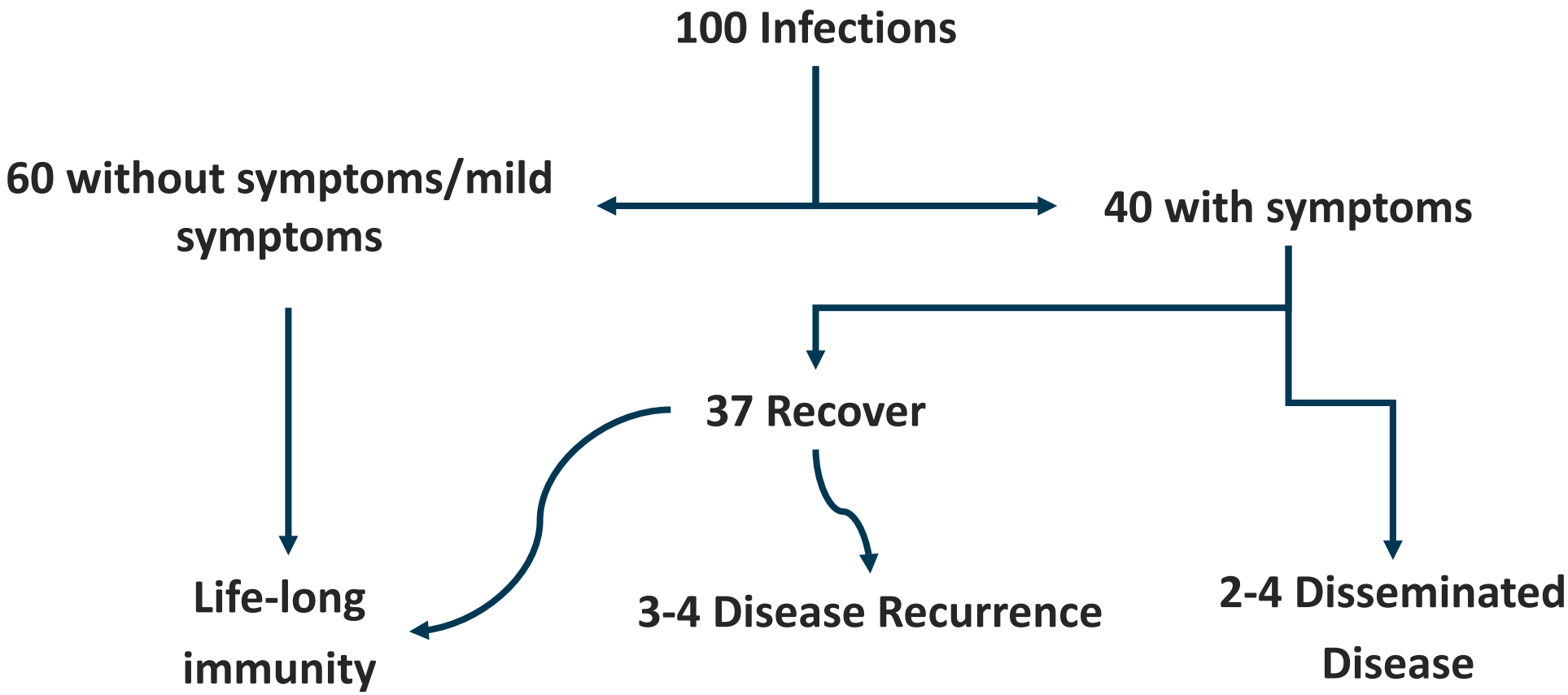
- Increasing temperatures and changes in precipitation patterns from climate change may cause a northward expansion of Coccidioides species

- Models show that by 2100, the states impacted will increase from 12 to 17 and increase the number infected by 50%



Coccidioidomycosis

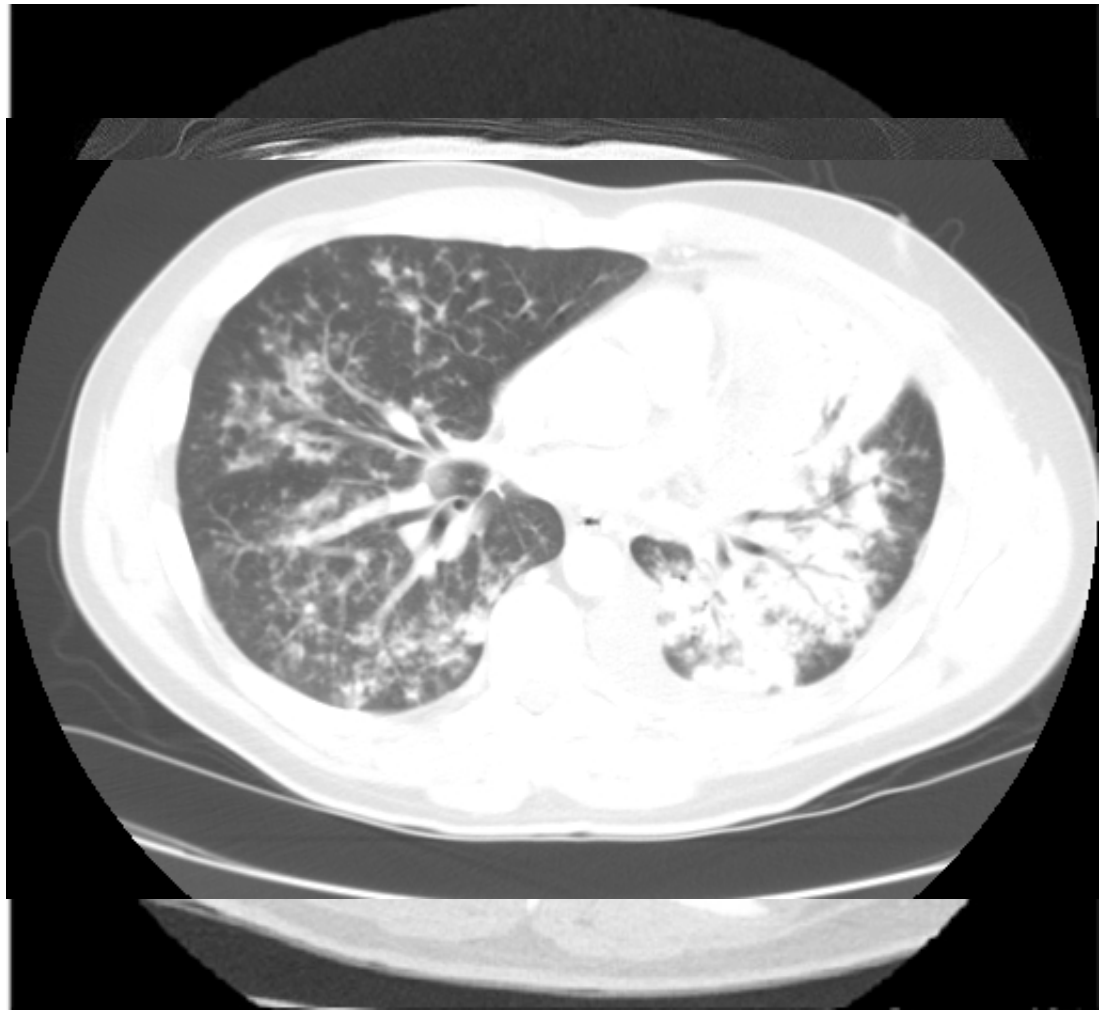
Patterns of Primary Disease



Primary Pulmonary Coccidioidomycosis

- Presentation
  - Fevers/chills/night sweats
  - Cough
  - Joint pain
  - Pleuritic chest pain
  - Headache
  - Fatigue (long lasting)
  - *Erythema nodosum/rash*
  - *Eosinophilia*

- ~5% to 10% of patients develop pulmonary sequelae



Complications from Primary Disease

- Pulmonary Nodule
- Pulmonary Cavity
- Chronic Fibrocavitary Disease
- ARDS
- Miliary Disease

Extrapulmonary Manifestations

0.5-2% of patients develop extrapulmonary disease

- Skin - Bones - Joints - Brain

Risk of dissemination depends on underlying risk factors

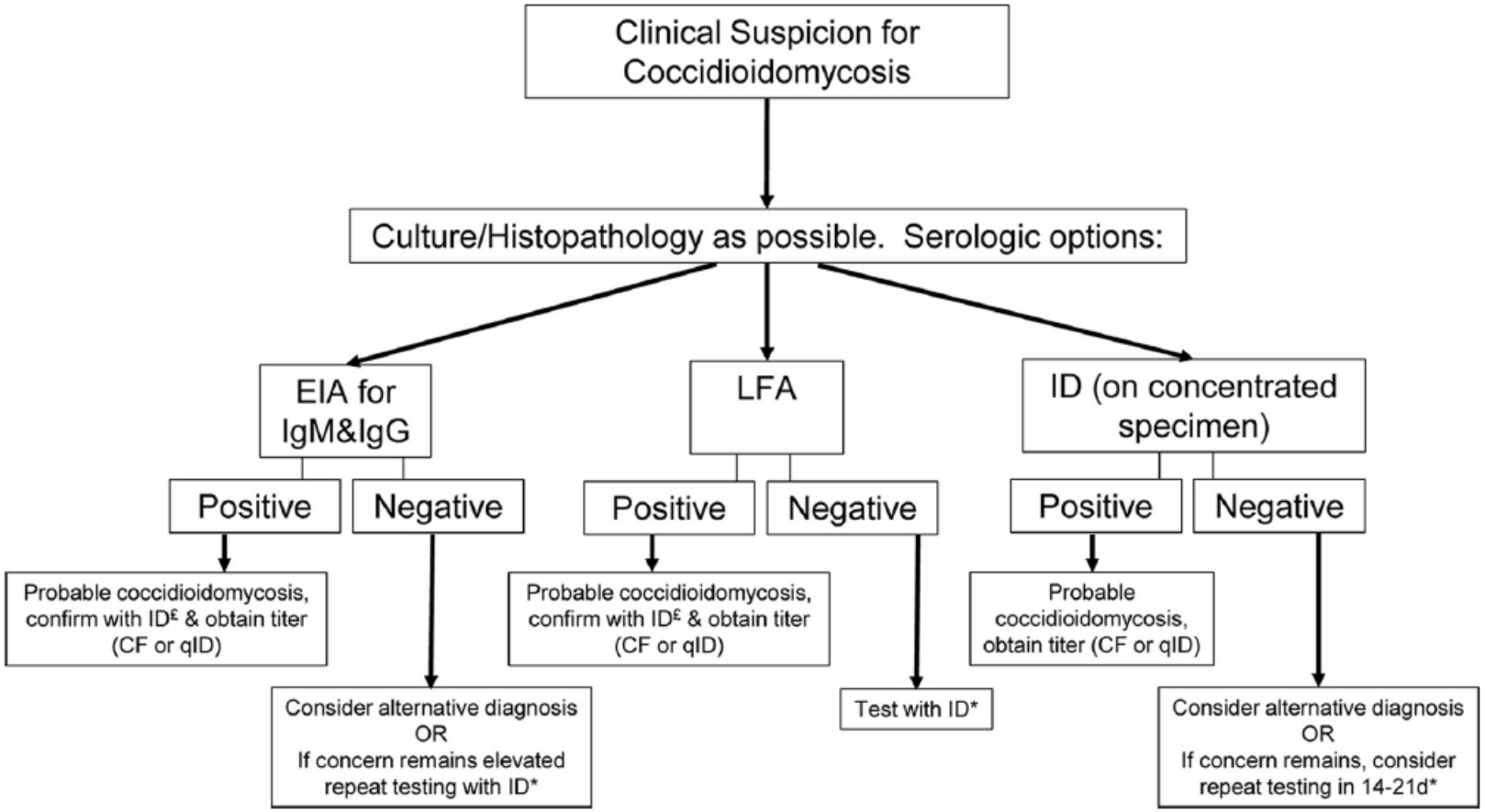
Immunosuppressed >

non-immunosuppressed

May have normal chest x-ray and no pulmonary symptoms

Coccidioidomycosis Diagnostics

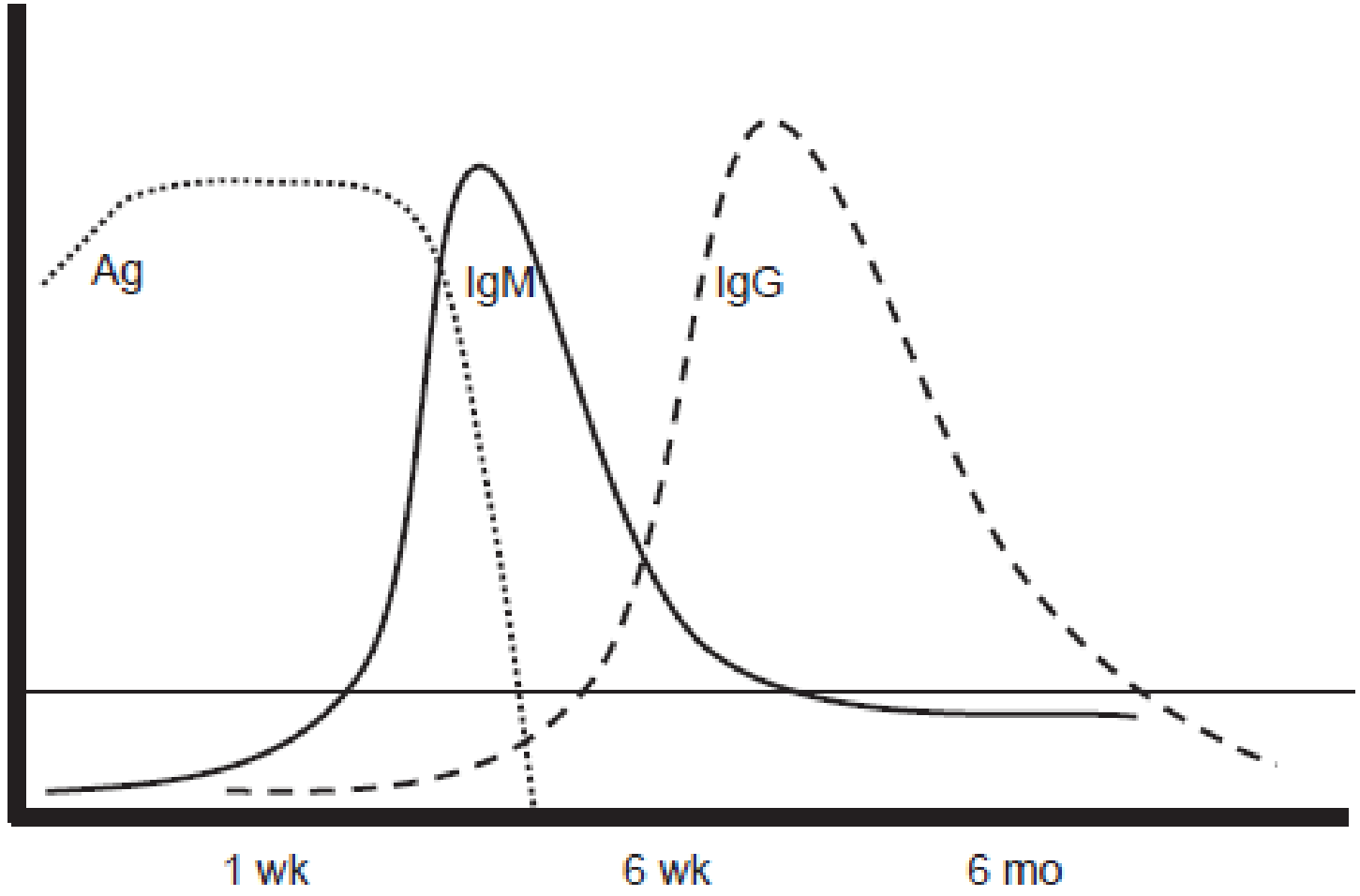
Diagnostic Pathways



https://doi.org/10.1128/jcm.01581-22

Timing of Diagnostic Positivity

- Given diagnostics, early disease may give false negative results
- Positive serology can develop after 1-3 weeks from initial presentation
- Serial testing should be done if symptoms persist despite initial negative testing



Coccidiomycosis Treatment

Who Gets Treated

- Severe/persistent disease

- Those at increased risk
  - Advanced age
  - Immunosuppressed
  - Diabetes
  - Cardiovascular disease
  - Pregnancy
  - Filipino/African-American descent

- Individualized

Complicated Disease

Mild to moderate disease	• Triazole for 3-6 months
Severe Disease	• Initial – combination amphotericin and triazole • Triazole therapy for at least 1 year
Chronic Pulmonary Infection	• Triazole therapy for at least 1 year

Questions