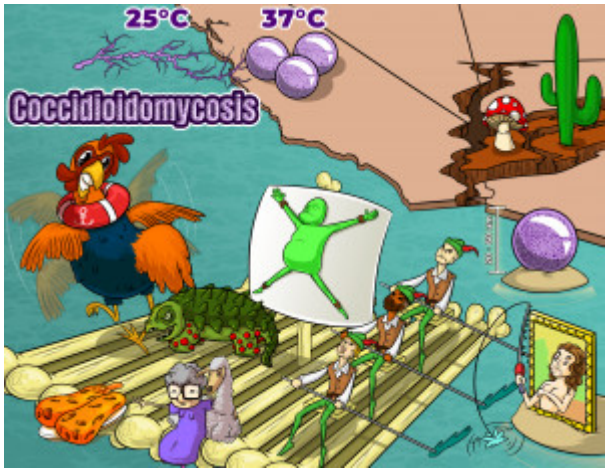
Coccidioidomycosis

Coccidiodomycosis is a systemic fungal disease caused by Coccidioides immitis, a dimorphic fungus that exists as a mold in cool temperatures and spherules in warm temperatures like soft tissue. The fungus is found as a mold in the soil, and produces hyphae with arthrospores that are easily dispersed throughout the air and inhaled. When the arthrospores are inhaled, they form spherules filled with endospores. These spherules measure 20-60 um and contain endospores that are slightly larger than red blood cells, which are around 6-8um. The spherules rupture and endospores spread throughout the body causing disease, most commonly in the lung, skin, bone, and brain. Most frequently, coccidiomycosis causes pneumonia, but it can also disseminate and cause meningitis or osteomyelitis. Common skin findings include erythema nodosum, which are painful red nodules found on the extensor surfaces like the anterior lower legs. Coccidiodomycosis typically causes granulomatous inflammation with caseous necrosis, which is a type of white cheesy appearing necrosis. C.immitis is commonly found in the Southwestern United States, particularly the San Jaoquin valley region, in deserts and in construction zones where the spores can be carried by dust storms. Any disruption of the soil can increase spread of the organism; thus, coccidiomycosis infections are also more frequent after earthquakes. No treatment is required for asymptomatic infections, but azoles can be used for systemic infections.



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Characteristics

Fungi
Fun-guy
This disease is caused by a fungus, C. immitis, and can thus be treated with azole drugs if symptomatic.

Dimorphic
Two-forms with Hyphae in Water and Spherule on Land
Coccidioides immitis is a dimorphic fungus that is endemic to the southwestern United States. Unlike the other systemic dimorphic fungi, coccidioides exists in tissue as a spherule that is 20-60 um, and not as a yeast. It grows as a yeast in warmer temperatures (37 degrees C), and as a mold with hyphae at cooler temperatures (20 degrees C).

Southwest
Map of Southwest and Cactus
Coccidioides immitis is endemic in the Southwest including Arizona, California, Nevada, and New Mexico. It also resides in northern Mexico and parts of Central and South America.

After earthquakes
Earthquake Cracks
This organism resides in the soil, and the spores are swept into the air when the soil is disrupted, such as during construction, farming, or after earthquakes. Earthquakes are especially associated with tremendous increases in case rates of Coccidioidomycoses.

Spherule
Spherule
The disease is spread by inhaling arthrospores, which turn into spherules in tissue that contain endospores within a thick refractive wall.

20-60 um
20-60 um
The spherules measure 20-60 um and contain endospores within that measure slightly larger than a RBC.

Signs and Symptoms

Pneumonia
Nude-Mona
The spherules rupture and endospores spread throughout the body causing disease, most commonly in the lungs. Therefore, this organism most commonly causes pneumonia.

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Meningitis

Men-in-tights

C.immitis can spread to the CNS and cause meningitis with granulomatous lesions.

Bone Infection

Bone Raft

Coccidiomycosis can spread to the bones and cause osteomyelitis with granulomatous lesions.

Skin infections

Skin-suit

Coccidiomycosis can cause ulcerating or pustular skin lesions when disseminated to the skin. Erythema nodosum is not a sign of dissemination, but is rather an immune response.

Erythema Nodosum

Nodosaur with Red Bumps on Legs

A skin finding not specific to coccidioimycosis, but commonly found in infection that presents as red, painful nodules on extensor surfaces like the shins.

Granulomatous Inflammation

Granny-llama

C. immitis causes a granulomatous inflammatory reaction in the body, characterized by granulomas that wall off the endospores unable to be phagocytosed by macrophages.

Caseous Necrosis

Cheesy Lungs

Coccidioimycosis causes caseous necrosis, which is a type of necrosis characterized by a creamy white cheesy necrotic debris.

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