COCCIDIOIDOMYCOSIS

Disease Category: Other (fungal)

Timeframe to follow-up: 1 week

Signs and Symptoms	• Most cases are asymptomatic or mild with flu-like symptoms (fatigue, cough, fever, shortness of breath, headache, night sweats, muscle aches or joint pain, rash on the upper body or legs) • ~5-10% of cases develop serious or chronic lung disease • Less than 1% of cases develop disseminated disease, when the infection spreads to other parts of the body
Incubation	Usually 1-3 weeks; disseminated infection may develop years after primary infection
Case Classification	Clinical criteria: At least 2 flu-like symptoms OR at least one more severe symptom as defined in Section III.A.2 below Laboratory criteria: Defined in section III.A.2 below Confirmed: In high incidence jurisdictions, meets confirmatory or presumptive lab evidence. In low-incidence jurisdictions, meets confirmatory lab evidence and either epi link or clinical criteria OR meets presumptive lab evidence and epi link and clinical criteria Probable: In low incidence jurisdictions, meets confirmatory lab evidence, does not meet epi link criteria, and does not meet clinical criteria OR meets presumptive lab evidence and either epi link or clinical criteria Suspect: In low incidence jurisdictions, meets presumptive lab evidence, does not meet epi link criteria, and does not meet clinical criteria
Differential Diagnosis	Influenza; other fungal infections like aspergillosis, blastomycosis, and histoplasmosis; tuberculosis; community-acquired pneumonia
Treatment	Primary infections usually resolve after days to a few weeks without therapy. Some antifungal medications are available to treat more severe and/or chronic infections, but recommendations for their use vary depending on the provider's clinical judgement and the patient's risk factors.
Duration	Symptoms usually persist for a few weeks to months, but some patients, especially those with chronic or disseminated disease, may have symptoms that last longer.
Exposure	Inhalation of fungal spores from the environment, rarely from lapses in laboratory biosafety.
Laboratory Testing	Local Health Authority can arrange testing if an outbreak is suspected OR for contacts. Contact the Nevada State Public Health Laboratory (NSPHL) for guidance such as sample collection instructions.
Control of Contacts	Contact notification is not usually needed for environmentally exposed contacts, unless the exposure occurred in a workplace (like a lab).

Key areas of focus during investigation	Travel history, outdoor activities, occupation
Public Health Actions	Reports of coccidioidomycosis cases must be made to the Local Health Authority during the regular business hours of the health authority on the first working day following the identification of the case. Local Health Authority to notify Office of State Epidemiology (dpbhepi@health.nv.gov) if outbreak suspected. For individual confirmed or probable cases: • Confirm diagnosis • Identify potential exposures • Prepare a case report and submit to the Chief Medical Officer (through OSE) within 7 days after completing the case investigation • Identify any additional cases with similar exposure history • Identify opportunities for dust mitigation activities or for public education to reduce the risk of exposure To the best of the local health authority's ability, each step of the investigation should be completed within one working day or in alignment with NAC 441A.
Key Partner Agencies	• Environmental Health • Nevada Department of Business & Industry Industrial Relations • Nevada State Public Health Laboratory

TABLE OF CONTENTS

COCCIDIOIDOMYCOSIS (VALLEY FEVER)

I. DISEASE REPORTING

A. Legal Reporting Requirements

A report to the health authority may be made by telephone; telecopy (in the form prescribed by the health authority); or any form of electronic communication identified by the health authority, following the specified format and procedure.[1]

1. Health Care Providers and Health Care Facilities

Health providers and facilities must notify the health authority where provider is located within the first working day after identifying the case.[1–3]

2. *Laboratories*

Laboratories must notify the health authority within the first working day after identifying the case.[1] If the lab is located outside of Nevada, notify the Nevada Chief Medical Officer through the Office of State Epidemiology (OSE) within the same timeframe.[1,4]

3. Local Health Authority (LHA)

LHA's must notify the Office of State Epidemiology (OSE) within 7 days after completing the case investigation.[5]

II. THE DISEASE AND ITS EPIDEMIOLOGY

A. Background

Coccidioidomycosis, also called Valley fever (and more rarely, "San Joaquin Valley fever" or "desert rheumatism"), is an infection caused by the fungus *Coccidioides*. The *Coccidioides* fungus has been found in soil in south-central Washington state; the southwestern United States including California, Arizona, New Mexico, west and south Texas, southern Nevada, and Utah; and parts of Mexico and Central and South America.[6] Coccidioidomycosis infections occur most often during the dry season in endemic areas. In the southwestern United States, this means that more cases occur between May-November.[7]

Coccidioidomycosis can affect people of any age, but it is most common in adults aged 60 and older and in people who are frequently exposed to dusty environments, like construction workers. People who may be at a higher risk of developing severe or disseminated disease, if infected, include:[8,9]

- People who have weakened immune systems,
- Pregnant women,
- Children younger than 1 year,
- People who have diabetes, and

- People who are Black or Filipino. While risk of exposure is equal for everyone in endemic regions, risk of severe disease seems to be higher among Black and Filipino individuals possibly related to underlying social determinants of health, health disparities, and genetic and immunologic predisposition.[10]

Less than 1% of coccidioidomycosis cases are fatal.[11]

B. Etiologic Agent

There are two species of disease-causing fungi within the *Coccidioides* genus: *Coccidioides immitis* and *Coccidioides posadasii*.[9] *Coccidioides* is considered saprophytic in soil and opportunistic/pathogenic in humans when its spores are inhaled.

C. Description of Illness

Most people who breathe in *Coccidioides* spores never get sick, and 60-65% of pulmonary infections are asymptomatic or mild.[9] Those who do develop symptoms usually spontaneously recover without treatment in days to weeks.[12] Symptoms include fatigue, cough, fever, shortness of breath, headache, night sweats, muscle aches or joint pain, and rash on the upper body or legs.

About 5-10% of people who are infected with coccidioidomycosis develop severe infection,[13] which may rarely disseminate to skin, bones, joints, and the central nervous system.[9]

D. Disease Burden in Nevada

Coccidioidomycosis is endemic to southern Nevada, and most of the state's cases occur in that jurisdiction.[14] There were 160 cases across the state in 2023, 149 of which were in southern Nevada.[15] Nationally, cases of coccidioidomycosis have been increasing since the 1990s.[7] Probably this observed increase in cases is likely due to environmental changes, population shifts into endemic areas, more soil disruption, improved diagnosis/reporting, and a growing proportions of vulnerable immunocompromised population.[16]

See the Nevada Office of State Epidemiology Communicable Disease Dashboard for Nevada specific data on coccidioidomycosis ("Other" section).

E. Reservoirs

There are no confirmed animal reservoirs, but soil, especially around rodent burrows in endemic areas, is considered an environmental reservoir.[12] It is important to note that animals, particularly dogs, can be infected with *Coccidioides*, but the disease is not transmissible from animals to people.

F. Modes of Transmission

People can get coccidioidomycosis by breathing in fungal spores from the air, but some people who breathe in the spores do not get sick.[17] The disease cannot be spread via the respiratory route of transmission between people or between people and animals. In very rare instances, person-to-person transmission can occur from a cutaneous infection, an organ donation of an infected organ, or congenital infection following vertical transmission in utero. In areas where *Coccidioides* is endemic, increases in coccidioidomycosis cases can

follow dust-generating events like storms, seismic activity, digging, and construction activities.[9]

G. Incubation Period

The incubation period for coccidioidomycosis ranges from 1 to 4 weeks.[12] Disseminated infection may develop years after primary infection.[9]

H. Period of Communicability

Coccidioidomycosis cannot be transmitted person-to-person via the respiratory route. However, there have been reports of rare transmission through transplantation of infected organs.

I. Testing

If additional testing is needed for contacts or cases, please reach out to the Nevada State Public Health Laboratory for guidance on proper sample collection, storage, and shipment instructions.

J. Treatment

Antifungal treatments and prophylaxis are available but recommendations for their use vary depending on the provider's clinical judgement and the patient's individual risk factors.[9]

Provide most current treatment guidelines from Red Book to the healthcare provider or refer case to physician for proper treatment for coccidioidomycosis.

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating the case of coccidioidomycosis, step by step, within one working day of notification or in alignment with NAC 441A.

A. Step 1: Review relevant information about the disease.

1. Review scientific information in Control of Communicable Diseases Manual, most recent edition.

2. Review Coccidioidomycosis/Valley Fever **(Coccidioides spp.)** *most recent case definition (2023 CDC).*

B. Step 2: Begin investigating the case.

1. Contact Reporting Source and/or Reported Case

Upon receiving an initial case report, review lab test results and available clinical details and epidemiologic factors. Please make three attempts to contact the case (text and phone calls) on separate days, at different times of the day (morning, afternoon, late afternoon). Document all attempts to contact a reporting source and/or reported case, preferably in the "Encounters" tab of EpiTrax. Please use case report forms (CRF) to gather accurate

information about the case. Focus on the key data elements listed above in the table. Filling out an electronic version of the CRF in EpiTrax (called a Confidential Morbidity Report (CMR) in EpiTrax) is preferred. If used, the completed PDF version should be attached to the CMR in EpiTrax. The CRF should be completed within 7 days of completing the investigation of the case.[5]

If possible, obtain information to determine if the patient has previously been reported as a coccidioidomycosis case in another jurisdiction. As of March 2024, there is no standardized system to check if a coccidioidomycosis case has been reported in another state; however, if it is known that a case was previously diagnosed or reported out-of-state, that case should not be counted or reported again.[18]

C. Step 3: Identify potential sources of infection

The investigation focuses on exposures in the 2 months before onset, including:

1. Travel to an area where coccidioidomycosis is endemic.
    a. Work with public health officials in the state where exposure may have occurred to decide if epidemiologic linkage criteria are met.[18]
2. Work in a dusty environment in an area where coccidioidomycosis is endemic.
3. Recreation in a dusty environment in an area where coccidioidomycosis is endemic.
4. Breach of biosafety standards in a lab that handles *Coccidioides* cultures or coccidioidomycosis clinical specimens.

If a case does not have a travel history to an endemic area in the past 2 months, consider their lifetime travel history to endemic areas as well.

D. Step 4: Initiate control measures for case and/or for contacts (see Section IV – Section VI below).

E. Step 5: Provide Education and Prevention messaging to the case and/or contacts (see Section IX below).

IV. CONTROL OF CASE

Current evidence suggests that after a person recovers from a case of coccidioidomycosis, they have lifelong immunity.[9] However, relapse can occur, and individuals with reduced immune function are at higher risk of relapse.[7]

1. Management/Exclusions for Specific Groups or Settings

	Symptomatic	Asymptomatic
Sensitive Occupation	N/A	N/A
Childcare/School Attendee	N/A	N/A
Case in a Medical Facility	Standard precautions	Standard precautions

General Population	N/A	N/A

2. Exclusion Notifications

Disease does not require any specific control measures of cases. Please provide education and prevention measures.

V. CONTROL OF CONTACTS

Persons who were exposed to the same source in an endemic area as the initial case are potential contacts. Laboratory personnel who were in a room in which a *Coccidioides* culture was handled outside of a biological safety cabinet are considered potential contacts.[19] Investigate symptomatic contacts in the same manner as a case.

1. Management/Exclusions for Specific Groups or Settings

	Symptomatic	Asymptomatic
Sensitive Occupation	N/A	N/A
Childcare/School Attendee	N/A	N/A
Case in a Medical Facility	Standard precautions	Standard precautions
General Population	N/A	N/A

2. Exclusion Notifications

Contact notification is not usually needed for environmentally exposed contacts of coccidioidomycosis. In the event of probable environmental exposure in a workplace, work with Environmental Health, Nevada Department of Business & Industry Industrial Relations, and the workplace to properly notify potential contacts.

In the event of a potential lab exposure event, work with the lab's designated biosafety officer to notify potential contacts and communicate the process outlined in Section VII. Management of Special Situations/Outbreak Control.

VI. CONTROL OF CARRIERS

A carrier state has not been documented for coccidioidomycosis and thus no carrier-specific control measures are needed.

VII. MANAGEMENT OF SPECIAL SITUATIONS/OUTBREAK CONTROL

Coordinate with senior epidemiology staff to determine if an outbreak is occurring. If so, notify DPBH Environmental Health, local health authorities, or infection control, as appropriate.

A. Transmission Linked to a Lab Exposure

Accidental exposure to *Coccidioides* in a lab may result in multiple contacts or a cluster of cases. The response to a lab occupational exposure to *Coccidioides* is different from natural

exposures because usually lab exposures consist of a much larger amount of spores and are more likely to cause symptomatic illness.[19] The steps below are based on the recommendations given in an article published in *Clinical Infectious Diseases* (2009):

- The lab, likely the lab's designated biosafety officer, will contact public health after the exposure event.
- Review the current infection prevention guidance for responding to a *Coccidioides* exposure event in a lab with the biosafety officer as needed.
- Work with lab management, building management, and/or Nevada Department of Business & Industry Industrial Relations staff to determine which individuals were in the room during the exposure event and if any other persons in the building might have been exposed.
- If feasible, work with NSPHL to obtain baseline serum samples to store from the exposed individuals to allow for future testing for IgG and IgM antibodies to determine prior infection history.
- As with all cases, gather medical and travel history information (in addition to other standard data fields required during a disease investigation such as demographics and pregnancy status) for all exposed individuals.
- All persons deemed to have been exposed to *Coccidioides* in a lab setting should be given a therapeutic dose of either itraconazole or fluconazole orally (400 mg daily, for adults) for 6 weeks, as prophylaxis.
    - If any of the potentially exposed individuals is pregnant, consult the *Clinical Infectious Diseases* guidance for considerations.
- Advise all exposed individuals to seek medical care if they develop symptoms in the 6 weeks following exposure so that they can be tested.
    - A second serum sample should be taken 3-12 weeks after symptom onset to compare with the results from the baseline sample.

VIII. PREVENTION

The investigator should reference the most recent disease specific public educational materials from the CDC.

- The best way to prevent coccidioidomycosis is to avoid breathing in large amounts of dust in areas where it is common in the environment, but it can be difficult to fully prevent environmental exposure.[8]
- The CDC's Travelers' Health Yellow Book may be a useful reference for people visiting areas where *Coccidioides* is endemic.

IX. REFERENCES

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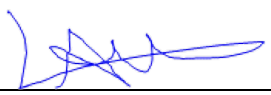
X. ACKNOWLEDGEMENTS

This document was developed based on the content and format of the disease investigation guidelines of several state and local health jurisdictions:

- Kansas Department of Health and Environment Coccidioidomycosis (Valley Fever) Investigation Guideline
- Washington State Department of Health Reporting and Surveillance Guidelines

The Nevada Office of State Epidemiology would like to acknowledge the work of these great partners.

XI. UPDATE LOG



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