Banner Health

Clinical Practice

Clinical Practice Title: Identification, Evaluation, and Management of Coccidioidomycosis in Adult Outpatients	
Clinical Practice Number: N/A	
Clinical Practice Owner (CCG) / Author:	**Contact Information**
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Brief Description of Clinical Practice
Adult outpatients with endemic exposure to Coccidioides who develop Community Acquired Pneumonia (CAP) or other compatible symptoms will be evaluated for coccidioidomycosis and managed in compliance with the current recommendations of the Infectious Disease Society of America (IDSA).

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Associated Documents		
Type	**Number**	**Name**
Policy		
Protocol		

Identification, Evaluation, and Management of Coccidioidomycosis in Adult Outpatients

PRACTICE APPROACH:
Expected Clinical Practice

PRACTICE STATEMENT:
Stat Adult outpatients with endemic exposure to Coccidioides who develop Community Acquired Pneumonia (CAP) or other compatible symptoms will be evaluated for coccidioidomycosis and managed in compliance with the current recommendations of the Infectious Disease Society of America (IDSA).

RATIONALE:
Coccidioidomycosis (a.k.a. Valley fever) is a reportable fungal infection endemic to Maricopa, Pinal, Pima, and other Counties of Arizona, much of Southern California, and other areas of the western United States (Nguyen et al., 2013). Current burden estimates of this disease are 50,000 newly infected persons seeking medical care annually, two-thirds of whom live in Arizona and most of the rest in California (CDC, 2013). Illness usually develops one to three weeks following exposure. Of these, most suffer many weeks to many months with CAP or immunologically mediated symptoms which eventually resolve with or without specific antifungal treatment. Virtually all of these persons are protected from second infections by life-long immunity (Ampel, Giblin, Mourani, & Galgiani, 2009). A few develop progressive, pulmonary infections or spread of infection beyond the lungs. These complications require referral to Pulmonary or Infectious Diseases specialists to supervise optimal management plans.

Many patients with the protracted but self-limited illness are not correctly diagnosed. In Arizona at least a quarter of CAP is due to coccidioidomycosis (Kim, Blair, Carey, Wu, & Smilack, 2009; Valdivia et al., 2006), but the Arizona Department of Health found only 2% to 13% of such patients were tested for this possibility (Chang et al., 2008). One reason that Valley fever is not considered more frequently is that most Arizona clinicians are trained where Valley fever is not common (Chen et al., 2011). Another is that in the past a standard approach to such patients has not been clearly articulated. As a result, clinicians manage a large majority of the self-limited coccidioidal infections inappropriately as bacterial pneumonia, asthma, possible lung cancer, or as autoimmune conditions. Even when these infections are correctly diagnosed, it is frequently after a significant delay during which extensive unnecessary and extensive ambulatory and hospital care is consumed (Donovan, 2017). For the few patients that develop complications, earlier recognition by General Internists, Family Practitioners, ED, Observation and Urgent Care clinicians will minimize the morbidity and residual disability.

There are recently published national guidelines for evaluation and management of coccidioidomycosis with particular attention to uncomplicated and self-limited infections (Galgiani et al., 2016). The University of Arizona Valley Fever Center for Excellence has implemented these guidelines in a training tutorial for primary care practitioners (PCP) (http://vfce.arizona.edu/sites/vfce/files/tutorial_for_primary_care_professionals.pdf) that is also endorsed by the Centers for Disease Control, the Arizona Department of Health Services, and the Arizona Medical Association. This Clinical Practice will incorporate these management elements to enable primary care practitioners to manage most uncomplicated coccidioidal infections optimally.

CLINICAL APPROACH:

Definition: For purposes of this clinical practice, an uncomplicated coccidioidal infection is one that has not produced serious respiratory distress and has neither risk factors nor physical evidence of extrapulmonary dissemination.

This Clinical Practice follows the **C-O-C-C-I** algorithm:

Consider the Diagnosis;
Order the right tests;
Check for risk factors;
Check for extrapulmonary complications;
Initiate Management

I. **Consider the diagnosis.**
Common findings in patients with newly acquired coccidioidal infections are:

Symptoms
- Fatigue
- Night sweats
- Cough
- Chest pain
- Dyspnea
- Hemoptysis
- Headache
- Arthralgias

Signs
- Fever
- Weight loss
- *Erythema nodosum*
- *Erythema multiforme*

Chest radiographs
- Pulmonary infiltrates
- Hilar adenopathy
- Pleural effusions

Since many of these findings are common and non-specific, the following constellation of findings are a guide to select patients for testing who either reside in or have recently visited endemic regions:

- Respiratory symptoms and at least one of the following:
  - More than 1 office visit
  - Chest X-ray ordered
  - Antibiotic prescribed
- Two of the following for a prolonged period:
  - Fever
  - Fatigue
  - Arthralgia
- Unexplained peripheral eosinophilia
- Skin lesions of:
  - *Erythema nodosum*
  - *Erythema multiforme*

II. **Order the right tests.**
- Patients with a syndrome suggestive of early coccidioidal infections should be tested for IgM and IgG anti-coccidioidal antibodies by enzyme-linked immunoassay (EIA).
- Further serologic evaluation of positive specimens includes reflex testing for IgM and IgG antibodies by immunodiffusion (ID).
- Patients with recently acquired coccidioidomycosis are frequently non-reactive by all serologic tests. Repeating serologic testing two to four weeks later increases the diagnostic yield. Even so, some patients with coccidioidomycosis will never demonstrate anti-coccidioidal antibodies.
- Once the EIA and the ID qualitative test is found to be positive, only repeated testing with the quantitative CF is appropriate.

III. **Check for risk factors; if present the infection is considered complicated and subspecialty referral is recommended.**
- Patients newly diagnosed with coccidioidomycosis are at high risk of complications if their cellular immunity is suppressed because of co-morbidities (HIV/AIDS, lymphoma, immunogenetic mutations) or medications (chronic corticosteroids, treatments to prevent solid organ transplant rejection or to treat autoimmune diseases such as rheumatoid arthritis, psoriasis, or inflammatory bowel diseases).
- Newly diagnosed coccidioidomycosis during pregnancy poses a high risk of complications
- Diabetes predisposes an increased risk of pulmonary complications.

IV. Check for extrapulmonary complications; if present the infection is considered complicated and subspecialty referral is recommended.

- In recently diagnosed coccidioidal infections, spread beyond the lungs (disseminated disease) may already be evident.
- The most common sites of dissemination are skin, joints, bones, and the meninges. However, virtually any part of the body can be affected.

Extrapulmonary lesions produce localized pain or discomfort, and is associated with inflammation and tissue destruction that nearly always evident by a careful review of systems and/or physical examination. Concern is heightened if the complaints are asymmetric (i.e., one knee, not both knees) which is different from the common symmetrical musculoskeletal complaints that immunologically mediated and do not represent infectious lesions.

V. Initiate Primary Care Management.

A large majority of patients with newly diagnosed coccidioidomycosis will not have risk factors or evidence of dissemination and can be managed without referral to specialists by PCPs whose practices are where coccidioidomycosis is endemic. PCPs elsewhere may diagnosed coccidioidomycosis much less frequently and therefore may appropriately prefer referral to a specialist to assist in management. Also, patients newly diagnosed with coccidioidomycosis by clinicians in an urgent care setting may prefer to refer the patient to a PCP for further evaluation and management.

- **Health education and recommendations to the patient and family**.
- **Antifungal therapy.** For early uncomplicated coccidioidal infections, most patients can be managed without antifungal therapy. There are currently four commercially available oral antifungal drugs with activity for treating coccidioidal infections: fluconazole, itraconazole, voriconazole, and posaconazole.
- **Physical therapy reconditioning as an approach to persistent fatigue.** Not infrequently, patients who resolve all evidence of active infection continue to be disabled because of profound fatigue. At this stage, persistent fatigue is likely a consequence of deconditioning. This can be addressed by the PCP with a referral to a physical therapist with the diagnosis of "generalized weakness resulting from coccidioidomycosis." A reconditioning program is often very helpful to hasten recovery.

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KEYWORDS AND KEYWORD PHRASES:

Valley Fever
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Community-acquired Pneumonia.
Coccidioidal pneumonia
Epidemiology
Immunology