

**IN THIS ISSUE: Inaugural Fungal Disease Awareness Week: Think Fungus When Your Patients are Not Getting Better**

**THINK FUNGUS**

**When Your Patient's Symptoms Are Not Getting Better with Treatment**

August 14-18, 2017, is the first Fungal Disease Awareness Week! The Centers for Disease Control and Prevention (CDC) and partners have organized this week to raise awareness among the public and healthcare providers about fungal diseases. Some fungal diseases often go undiagnosed and cause serious illnesses around the world. Increased awareness about fungal diseases is one of the most important ways to reduce delays in diagnosis and treatment, which can lead to better health results and save lives.

Fungi are everywhere. There are approximately 1.5 million different species of fungi on Earth, but only about 300 of those are known to make people sick. Fungal diseases are often caused by fungi that are common in the environment. Fungi live outdoors in soil and on plants and trees as well as on many indoor surfaces and on human skin. Most fungi are not dangerous, but some types can be harmful to health.

In this issue, two fungal diseases will be addressed. They are Coccidioidomycosis, also known as "Valley Fever" or "Cocci", which is emerging locally and Candidiasis caused by *Candida auris*, which is emerging globally.

**Coccidioidomycosis (Cocci or Valley Fever)**

Coccidioidomycosis, also known as "Cocci", "Valley Fever", "San Joaquin Valley fever", or "desert rheumatism", is caused by inhaling spores of the soil-dwelling fungi *Coccidioides immitis* or *Coccidioides posadasii*. Most infections are subclinical. When clinical manifestations do occur, they typically occur 1-4 weeks after exposure. The clinical presentations are similar to influenza or community-acquired pneumonia. Disseminated disease is rare. Residual pulmonary nodules can lead to chronic lung disease. Mild cases often resolve without specific therapy.<sup>1</sup> Cocci is a nationally notifiable disease and has been a reportable disease since 1992 in Nevada per NAC 441A.

Cocci is endemic to the hot, arid regions of the Southwestern United States and Central and South America. Although Nevada is listed as one of five endemic states by the Centers for Disease Control and Prevention (CDC), the majority of reported cases in Nevada are in Southern Nevada. In Washoe County, the morbidity had

been generally low with an average 2-3 reported cases per year prior to 2015. Those cases typically had a travel history to endemic areas during their incubation period. Since 2015, the number of reported cases per year has more than tripled.

In 2015, 11,072 cases were reported to CDC. A total of 10,873 (>98%) were from Arizona, California, Nevada, Utah, and New Mexico. Arizona and California accounted for 96% of total reported cases in the nation<sup>2</sup>. In 2013, *Coccidioides immitis* was identified in soil from south central Washington. The soil was tested because there had been three acute Cocci cases reported in late 2010 in WA. These three patients had not reported any travel history within 22 months of illness onset to an area where cocci is known to be endemic. Now, the south central part of Washington is considered endemic for Cocci.<sup>3</sup> During the ten-year period from 2005 through 2014, a total of 28 Cocci cases were reported with an average 2-3 reported cases per year in Washoe County. In the two year period between 2015 and 2016, a total of 17 cases were reported. The majority of them did not have travel history reported within one month of their illness onset. This leads to the hypothesis that *Coccidioides* spp. may exist in Washoe County soil. Therefore, the Washoe County Health District (WCHD) is participating in a collaborative investigation with multiple agencies. To date in 2017, a total of 11 cases have been reported, the highest number ever reported in Washoe County.

Due to the increasing morbidity in Washoe County, WCHD highly recommends that healthcare providers familiarize themselves with the clinical presentation of this disease, the diagnostic tests, and the clinical management tools while epidemiological and environmental investigations are ongoing.

To recognize and treat Cocci, it is highly recommended to follow these five steps: **Consider the diagnosis, Orders the right tests, Check for risk factors, Check for complications, Initiate management (COCCI).**

***C-Consider the diagnosis***

The most common symptoms are fatigue, night sweats, and pulmonary symptoms such as cough, chest pain, dyspnea, and hemoptysis. Fatigue is often the most prominent symptom. Statements like "I went to bed and didn't wake up for 15 hours" or "I got up for breakfast and then was exhausted" are common. The frequency of other symptoms/signs in reported cases is: fever (~50%),

<sup>2</sup> <https://www.cdc.gov/mmwr/volumes/65/wr/mm6546a9.htm>

<sup>3</sup> <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6320a3.htm>

<sup>1</sup> <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6320a3.htm>

arthralgia (22%), headache (~20%), skin manifestations (7-16% depending on gender), and weight loss (5-10%).

### O-Order the right tests

Ordering the right test(s) and making an early diagnosis will have many values, such as allaying patient anxiety by dispelling the fear of cancer, decreasing the need for invasive and expensive tests, removing the temptation for empiric therapy, and allowing for earlier detection of complications. Many tests are available for diagnosis of Cocci or establishing a prognosis. Test interpretation is relatively complicated. Serological tests are the most frequently used approach. Such tests include:

1. Tube precipitin (TP) antibodies (IgM Test)
2. Complement fixing (CF) antibodies (IgG Test)
3. Immunodiffusions tests (IDTP for IgM, IDCDF for IgG)
4. Enzyme-linked immunoassays (EIA) – IgM or IgG
5. Latex tests for Cocci antibodies
6. Cultures for *Coccidioides* spp.
7. Skin testing – more likely for prognostic purpose

The first 5 tests listed above are for Cocci antibodies. Some tests are highly specific while others have a significant frequency of false-positive results. But two general principles are useful in the primary care setting:

1. A positive serologic test for coccidioidal antibodies is highly presumptive of a coccidioidal infection. Therefore, a positive serologic result should always be reviewed by someone familiar with test interpretation.
2. A negative serologic test should never exclude a coccidioidal infection. In evaluating a possible coccidioidal infection, repeated serologic tests will increase the sensitivity for diagnosis.

Culture always provides definitive evidence of Cocci. However, early infections are usually not diagnosed by culture. As a general rule, the more serious the illness, the more likely fungal cultures should be considered as an essential part of the diagnostic evaluation. The skin testing may have more prognostic significance than diagnostic purpose.

### C-Check for risk factors

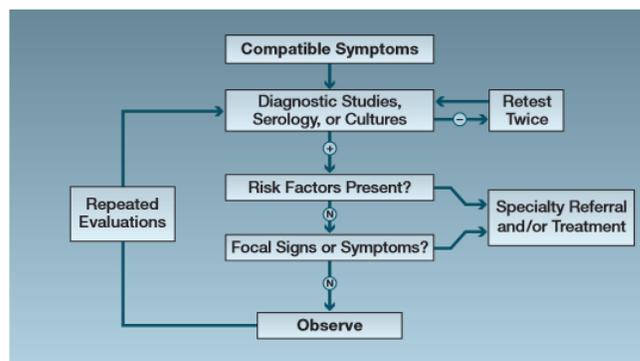
The first step after making a diagnosis is to check risk factors that might make the patient particularly susceptible to complications. These risk factors include immunosuppression, diabetes mellitus, and pregnancy. In addition, gender, age, race and ethnicity are also factors to be considered. For example, African Americans, Filipinos, and perhaps other racial groups appear to be at risk for disseminated infection.

### C-Check for complications

Most complications manifest within the first year or two after the initial infection. Checking for progressive pulmonary syndromes or disseminated disease is a critical step in primary case management.

### I - Initiate management

General guidelines for managing patients with uncomplicated infections are outlined in the figure below.



For early uncomplicated cocci, most patients can be managed without antifungal therapy. There are currently five commercially available oral antifungal drugs with activity for treating Cocci: ketoconazole, fluconazole, itraconazole, voriconazole, and posaconazole.

**More in-depth coverage in primary care management of Cocci can be found in this booklet<sup>4</sup>. Should you need a hard copy of this booklet, please send your email to [EpiCenter@WashoeCounty.us](mailto:EpiCenter@WashoeCounty.us) including your mailing address. Physicians or nurses can also obtain CME and CNE credits by watching this 0.5 hour video to learn more about Valley Fever here <https://www.cdc.gov/fungal/diseases/coccidioidomycosis/health-professionals/cme.html>.**

## Candida Auris

Candidiasis is a fungal infection caused by yeasts that belong to the genus *Candida*. There are over 20 species of *Candida* yeasts that can cause infection in humans, the most common of which is *Candida albicans*. However, *Candida auris* is an emerging fungus that presents a serious global health threat. Healthcare facilities in several countries have reported that *C. auris* has caused severe illness in hospital patients. Some



strains of *C. auris* are resistant to all three major classes of antifungal drugs. This type of

multidrug resistance has not been seen before in other species of *Candida*. Also of concern, *C. auris* can persist on surfaces in healthcare environments and spread between patients in healthcare facilities. CDC has developed recommendations to help with identification, treatment, and infection control and to prevent the spread of *C. auris*<sup>5</sup>. Local hospital laboratories may have difficulty in identifying this organism. Should hospitals have any suspected cases, please notify WCHD at 775-328-2447 immediately so WCHD can coordinate with the state lab for further laboratory identification.

<sup>4</sup> [http://vfce.arizona.edu/sites/vfce/files/tutorial\\_for\\_primary\\_care\\_professionals.pdf](http://vfce.arizona.edu/sites/vfce/files/tutorial_for_primary_care_professionals.pdf)

<sup>5</sup> <https://www.cdc.gov/fungal/diseases/candidiasis/candida-auris.html>