



# DIAGNOSIS AND TREATMENT OF ORAL CANDIDIASIS INFECTION

-A course for dentists and dental auxiliary-



**INSTRUCTIONS:** Read and study the narrative. Complete the quiz and registration form, and mail (along with registration fee) to: **University of Tennessee Health Science Center, Continuing Dental Education, 875 Union Avenue, Memphis, TN 38163** or fax completed quiz, registration form and credit card information to **(901) 448-1514**.

Please direct all questions to the CDE office, (901) 448-5386, fax us at (901) 448-1514, or email [utcde@utmem.edu](mailto:utcde@utmem.edu). For more information or a list of continuing education activities, visit our website at <http://cde.utmem.edu>.

---

**TUITION:** \$15 per registrant or \$10 per registrant for multiple registrants from the same office.

**CE Credit:** 1 hour **\*\* (Registrants must correctly answer 80% of the quiz questions to receive credit)\*\***

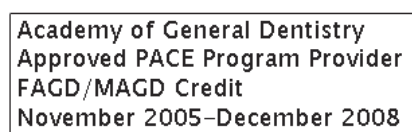
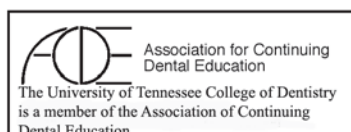
## **COURSE OBJECTIVES:**

1. Provide the clinician with the understanding of the factors that contribute to the presence of oral candidiasis infection.
2. Provide the clinician with the ability to recognize oral candidiasis infection in all of its clinical presentations.
3. Enable the clinician to effectively treat oral candidiasis infection in his or her practice.



**K. Mark Anderson, DDS, MS**, is a Diplomate of the American Board of Oral and Maxillofacial Pathology. Dr. Anderson, a UT dental graduate, is an Assistant Professor in the Division of Oral and Maxillofacial Pathology at the University of Tennessee Health Science Center College of Dentistry. He received his certificate in oral and maxillofacial pathology and masters in oral biology from Ohio State University.

For additional information or questions concerning this course, please contact Dr. Anderson at [kander20@utmem.edu](mailto:kander20@utmem.edu).



## **DIAGNOSIS AND TREATMENT OF ORAL CANDIDIASIS INFECTION**

Undoubtedly, one of the most common infections that we see in our dental patients is oral candidiasis. As common as this infection is, however, numerous cases of candidiasis remain undiagnosed and untreated for months or even years. Whether this is due to a failure in recognizing the signs and symptoms of infection or a lack of knowledge of treatment regimens is unclear. However, once the clinician is familiar with the clinical spectrum of this disease, the diagnosis and treatment of oral candidiasis infection can be a relatively straightforward and routine aspect of dental practice.

The infection is caused by *Candida Albicans*, a dimorphic fungal organism that typically is present in the oral cavity in a non-pathogenic state in about one-half of healthy individuals. Normally present as a yeast, the organism, under favorable conditions, has the ability to transform into a pathogenic (disease causing) hyphal form. Conditions that favor this transformation include broad-spectrum antibiotic therapy, xerostomia, immune dysfunction (secondary to systemic diseases such as diabetes or the use of immune suppressant medications), or the presence of removable prostheses. Furthermore, about one in four patients with lichen planus will have superimposed candidiasis. Unless the patient is severely immunocompromised, the infection is generally limited to the superficial mucosa and skin. Invasive candidiasis infection is rare, with disseminated disease even more so. This superficial nature of the infection makes oral candidiasis so amenable to treatment.

### **CLINICAL SPECTRUM OF DISEASE**

Infection with *Candida Albicans* presents in any of four forms: pseudomembranous candidiasis, hyperplastic candidiasis, erythematous candidiasis, or angular cheilitis. Patients may exhibit one or a combination of any of these presentations. Angular cheilitis, for example, will frequently be seen in combination with erythematous candidiasis in denture wearers.

### **PSEUDOMEMBRANOUS CANDIDIASIS**

Pseudomembranous candidiasis, commonly known as “thrush,” is the form often seen in neonates. It can also be seen in patients receiving topical corticosteroid therapy or in immune suppressed patients. In fact, the presence of pseudomembranous candidiasis in a seemingly healthy adult may be an indication of underlying systemic disease, such as infection with the human immunodeficiency virus (HIV).

Pseudomembranous candidiasis presents as multiple white plaques of material resembling cottage cheese that can easily be wiped away. These plaques consist of tangled aggregates of hyphae. The underlying mucosa may be erythematous, but ulceration would not be expected. While symptoms are typically mild for this form of infection, patients may complain of a slight tingling sensation or a foul taste.

### **HYPERPLASTIC CANDIDIASIS**

The diagnosis of hyperplastic candidiasis can be somewhat more difficult. This form has been referred to as “candidal leukoplakia,” although this terminology should probably be avoided. The clinical diagnosis of leukoplakia is made only after no specific causative agent can be identified. It also implies a more ominous condition. Therefore, candidal leukoplakia is a contradictory term that may unnecessarily alarm the patient in the age of the World Wide Web.

Like leukoplakia, hyperplastic candidiasis will present as a white plaque that cannot be wiped away by the clinician. Unlike leukoplakia, however, lesions should completely resolve with routine antifungal therapy. If candidiasis infection is suspected in the etiology of a plaque-like lesion of the oral cavity, a course of antifungal therapy is reasonable before the decision to biopsy is made. After treatment, any remaining lesional tissue should be treated as leukoplakia and biopsied for a more definitive diagnosis.

### **ERYTHEMATOUS CANDIDIASIS**

Many conditions fall under the spectrum of erythematous candidiasis. As the term implies, lesions clinically appear red or erythematous. While any mucosal site may be affected, erythematous candidiasis commonly involves the tongue and palate.

A form of erythematous candidiasis that is especially common involves the hard palate and gingiva beneath a denture or removable partial denture. This presentation is often referred to as denture sore mouth or, more appropriately, denture stomatitis. Older dentures that have not been cleaned and maintained properly are especially susceptible to candidal infestation. The organism thrives within the small porosities of the denture acrylic. Therefore, therapy must include disinfection of the denture or partial, along with treatment of the oral cavity. Failure to do so will result in treatment failure. Adequate disinfection of the denture, however, along with appropriate antifungal treatment of the oral mucosa will result in prompt resolution.

Erythematous candidiasis also commonly involves the dorsal tongue. This presentation, referred to as central papillary atrophy, appears clinically as a loss of filiform papillae, usually limited to the middle portion of the posterior dorsal tongue. Historically, this clinical presentation was referred to as "median rhomboid glossitis" and was thought to be developmental in nature. Experience, however, has established candidiasis as the etiologic agent. Anti-fungal therapy will usually result in complete resolution, with regeneration of papillae. Untreated infection, however, can progress to almost total loss of papillae, leaving the entire dorsal tongue erythematous and atrophic. Patients may also experience a burning or tingling sensation with this presentation.

### **ANGULAR CHEILITIS**

The final clinical presentation of oral candidiasis infection is angular cheilitis. This form presents as cracking, peeling, or ulceration involving the corners of the mouth. It will frequently be seen in combination with one of the other forms of candidiasis infection, such as the erythematous type. Patients with a reduced vertical dimension of occlusion, secondary to severe attrition or worn dentures, are particularly susceptible to the development of angular cheilitis. This is due to the increased folding of the soft tissue that is frequently seen at the corners of the mouth, creating a haven for the organism. Occasionally, the lips can become infected with candidiasis, as well. This is sometimes referred to as cheilocandidiasis or cheilocandidosis, and presents as a peeling or cracking, often accompanied by a burning or tingling sensation. While patients with this presentation will typically express the need for lip balms or lotions, this should be discouraged until the infection has been resolved. Furthermore, any product that has been placed on the lips during active infection should be discarded, due to the possibility of contamination.

### **TREATMENT**

For the normal healthy patient, the treatment of oral candidiasis is relatively simple and effective. Typically, topical medications are adequate. A commonly prescribed anti-fungal agent, nystatin oral suspension, will usually resolve most infections. However, topical medications must be in contact with the organism to eliminate it. Since patients are usually unable to hold liquids in their mouths more than briefly, clotrimazole troches are an effective alternative. These are dissolved slowly in the oral cavity, allowing the drug to be present for greater length of time.

Patients with dentures or removable prostheses must disinfect them as well. For complete dentures or partials made entirely of acrylic, this can be accomplished with a dilute bleach solution, once or twice a day for about fifteen minutes. Usually, a tablespoonful of bleach in a cup of water is adequate and will not harm the prosthesis. For patients with metal-based partials, however, bleach should not be used. Nystatin oral suspension will adequately disinfect these appliances without any harm to the metal framework.

Periodically, patients will have multiple recurrences of oral candidiasis infection. For these patients, systemic medications, such as fluconazole, may prove more effective. This medication also has the convenience of daily dosing, which some patients may prefer.

Topical medications are also effective against angular cheilitis and cheilocandidiasis. These lesions, however, will often show the presence of bacteria, in combination with *candida*. Therefore, therapy directed at both bacterial and fungal organisms is often necessary. A preparation of iodoquinol and hydrocortisone is extremely effective. Since many of these patients will also have intraoral candidiasis infection, concomitant treatment with clotrimazole troches or nystatin suspension is frequently indicated.

### **CONCLUSIONS**

Oral candidiasis infection is one of the most commonly occurring conditions involving the oral cavity. Recognition of the signs and symptoms associated with oral candidiasis and the appropriate therapy can become a routine component of the successful dental practice. Patients stand to benefit significantly from this relatively simple process.

## **REFERENCES**

1. Appleton SS, DDS, MPH, MSD. "Candidiasis: Pathogenesis, Clinical Characteristics, and Treatment." 2000 Journal of the California Dental Association. URL: [http://www.cda.org/cea\\_member/pubs/journal/jour1200/candi.html](http://www.cda.org/cea_member/pubs/journal/jour1200/candi.html)
2. Davies R, Bedi R, Scully C. "Oral Health Care for Patients with Special Needs." URL: <http://www.altcorp.com/AffinityLaboratory/specialneeds.htm>
3. HIVdent.org. "Picture Gallery: Oral Manifestations of HIV and AIDS and Dental Treatments." URL: <http://hivdent.org/slides/index.htm>
4. Nevill BW, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial Pathology, ed 2. Philadelphia, 2002, W.B. Saunders.
5. Sapp, JP, Eversole LR, Wysocki GP. Contemporary Oral and Maxillofacial Pathology, ed 2. St. Louis, 2002, Mosby.

**\*\*Please duplicate and complete one form for each registrant.\*\***

**Instructions:** Answer the questions by choosing the best possible answer. Registrants must correctly answer 80% of the test questions to receive CE credit.

### DIAGNOSIS AND TREATMENT OF ORAL CANDIDIASIS INFECTION

1. Which of the following clinical presentations of oral candidiasis infection is commonly known as “thrush?”
  - a. Pseudomembranous
  - b. Hyperplastic
  - c. Erythematous
  - d. Angular cheilitis
  
2. Which of the following morphologic forms represents the pathogenic form of *candida albicans*?
  - a. Mold
  - b. Yeast
  - c. Hyphae
  - d. Spore
  
3. Which of the following statements regarding hyperplastic candidiasis is **false**?
  - a. It clinically resembles leukoplakia
  - b. It is easily wiped away
  - c. It usually resolves with antifungal therapy
  - d. It may be more difficult to diagnose
  
4. Which of the following is **not** a presentation of erythematous candidiasis?
  - a. Central papillary atrophy
  - b. Denture stomatitis
  - c. Candidal leukoplakia
  - d. All of the above would be considered erythematous candidiasis
  
5. Which of the following statements regarding angular cheilitis is **false**?
  - a. Patients with reduced vertical dimension are particularly susceptible
  - b. It typically will be seen in combination with one of the other forms of candidiasis infection
  - c. It may also show the presence of bacteria
  - d. It should be treated with systemic antifungal agents
  
6. Which of the following treatment regimens would **not** be appropriate for patients wearing metal-based partial dentures?
  - a. The partial denture should be soaked in a solution containing bleach
  - b. The partial denture should be soaked in an anti-fungal agent, such as nystatin oral suspension.
  - c. Topical agents are often adequate for treatment of the oral cavity
  - d. Systemic fluconazole may be used for recurrent infections

---

**REGISTRATION FORM:** Duplicate and complete one registration form for each registrant. Please direct all questions to the UT Continuing Dental Education office (901) 448-5386 or email [utcde@utmem.edu](mailto:utcde@utmem.edu)

Name \_\_\_\_\_ Last 4 digits of SS# \_\_\_\_\_

Mailing Address \_\_\_\_\_ Day Phone \_\_\_\_\_

City, State, ZIP \_\_\_\_\_ Fax \_\_\_\_\_

E-mail \_\_\_\_\_  Multiple registrants in same office

Total Amount: \_\_\_\_\_ Charge my: VISA MasterCard Card No. \_\_\_\_\_

Expiration Date \_\_\_\_\_ Signature \_\_\_\_\_

Make checks payable to **University of Tennessee**  
Mail completed test, registration form and payment to:  
**Continuing Dental Education, 875 Union Avenue, Memphis, TN 38163**  
or fax completed test, registration form, and credit card info to **(901) 448-1514**.