INTERNATIONAL JOURNAL
*of* PEDIATRIC DERMATOLOGY

*Special Issue, 2025*
*ISSN 3035-1006 online*

*Narrative Review*

# The Three Most Important Things to Tell Parents of a Newborn/Infant with a Candida Infection

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**KEYWORDS**

*Candida,*
*Stomatitis,*
*Oral candidiasis,*
*Genital candidiasis,*
*Vulvovaginitis,*
*Imidazoles*

**ABSTRACT**

This work outlines the spectrum of clinical presentations of Candida infections affecting the mucosal surfaces and skin in pediatric patients.

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## Introduction

Candidiasis is a fungal infection caused by yeasts belonging to the genus *Candida*. More than 20 *Candida* species are known to cause infections in humans, the most common of which is *Candida albicans*. *Candida* yeasts are normally part of the intestinal microbiota and can be found on mucosal surfaces and skin without causing disease. *Candida albicans* (CA) is an endogenous microorganism, both commensal and pathogenic, present in 40–80% of individuals. It is the species most frequently associated with superficial candidiasis, although other species may also be involved, including *Candida glabrata, C. tropicalis, C. parapsilosis, C. krusei, C. guilliermondii, C. kefyr, C. rugosa, C. dubliniensis,* and *C. famata*. It is a saprophytic organism commonly found on mucosal and cutaneous surfaces, particularly the oral cavity, gastrointestinal tract, genitourinary tract, conjunctivae, perigenital skin, and large skin folds. Oral colonization may begin in early infancy (≈70% of neonates). CA exhibits a high degree of adaptability to various environmental conditions and can alternate between a quiescent ovoid spore form typical of yeast (Y form) and an active filamentous hyphal form (H form), which is associated with pathogenicity. When host immune tolerance mechanisms are compromised, the Y form transitions to the H form and expresses virulence traits.

## Candidiasis

*Candida* is not normally found on intact skin under physiological conditions. However, it can proliferate and cause infection when the local environment - such as within the oral cavity, pharynx, esophagus, or in skin folds, particularly in the inguinal-genital or axillary regions - undergoes changes that favor yeast growth. The most common clinical manifestations include:

1. **Oropharyngeal Candidiasis.** It presents as solitary or confluent white plaques on the oral mucosa, which may appear erythematous. The tongue may also be affected, showing erythema and loss of lingual papillae (erythematous candidiasis). Treatment. In many patients, topical therapy is effective using amphotericin B, nystatin, or oral miconazole gel (the latter being easier to administer in neonates).
2. **Candida Stomatitis**. Candidiasis that develops in the oral cavity or pharynx is among the most common forms (with a prevalence of approximately 5%), often beginning within the first week of life. The infection typically affects the buccal mucosa, tongue, and hard palate. In more severe cases, it may extend to the pharynx, trachea, and bronchi. Neonatal contamination occurs during passage through the birth canal (1).

Clinical Presentation:

• *Erythematous stomatitis* affecting the gingiva and palate. The mucosa may appear smooth, red, and glazed.
• *Oral thrush* (Fig. 1), characterized by raised whitish plaques on the oral mucosa, sometimes with a curd-like or pseudomembranous appearance. Removal of the plaques reveals a bright erythematous surface.
• *Angular cheilitis* (also known as Perlèche) (Fig. 2), which may be unilateral or bilateral. It often involves the labial commissures, with possible extension to the buccal mucosa, presenting with erythema, maceration, and fissured rhagades (2).
• *Erythematous glossitis*, with loss of lingual papillae. Spontaneous pain or pain during swallowing is frequently reported.

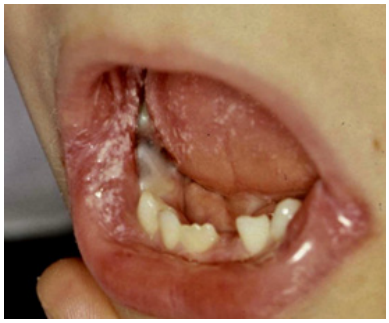

**Fig. 1.** *Oral Thrush. Tipical whitish plaques on the oral mucosa.*

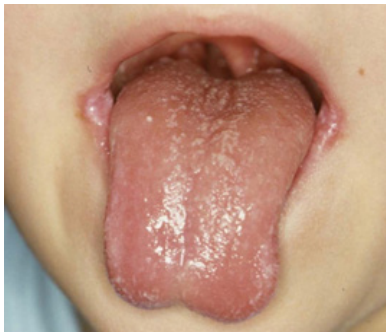

**Fig. 2.** *Angular cheilitis.*

3. **Cutaneous Candidiasis.** Cutaneous candidiasis is generally a secondary infection that arises in the context of a pre-existing medical condition. In rare cases, such as diffuse cutaneous candidiasis, it may present as a primary skin infection in neonates (3). The most common form in pediatric patients is localized to the diaper area and presents in two distinct patterns:

• *Primary diaper-area candidiasis* (Fig. 3), characterized by perianal erythema and satellite lesions.
• *Secondary diaper-area candidiasis,* which develops as a superinfection of an underlying irritant contact dermatitis in the diaper region, with satellite lesions extending to the thighs and occasionally to the abdomen.

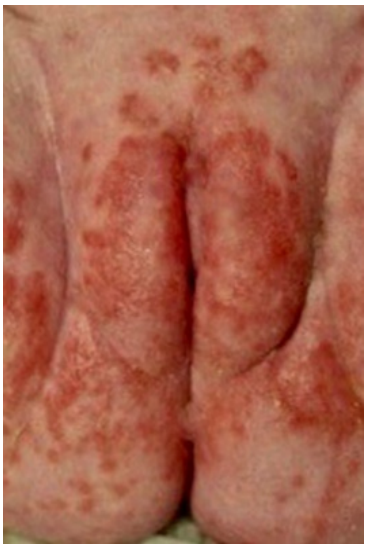

**Fig. 3.** *Primary diaper-area candidiasis. Periorificial erythema and satellite lesions.*

Topical treatment with imidazole derivatives, terbinafine, or nystatin is generally effective. In most cases, concurrent oral administration of nystatin is recommended to reduce intestinal *Candida albicans* colonization.
• **Candida Intertrigo**. Candida intertrigo is an inflammatory dermatosis, often triggered by mechanical or traumatic factors, and typically localized to body folds. Secondary infections by *Candida* species may occur, as these yeasts readily colonize inguinal, perianal, and gluteal regions—especially under conditions of increased local humidity. Clinical presentation includes erythematous, exudative, and macerated areas; confluent erythematous plaques; mild erosions; and peripheral erythematous-pustular lesions.
• **Candida Vulvovaginitis**.*Candida* has been isolated from the vaginal tract in 10–20% of healthy women of reproductive age (4). In 80–92% of vulvovaginitis episodes, *Candida albicans* is identified. In healthy individuals, mucosal surfaces are often colonized by *C. albicans*, whose low population density does not damage epithelial cells nor elicit an inflammatory response. Host immune defenses are typically sufficient and effective. Symptomatic vaginitis, although rare in prepubertal girls (3–6%), occurs when the host's colonization site becomes favorable to yeast proliferation (5). In neonates, the vaginal mucosal epithelium - although only for a few days - shares characteristics with that of women of reproductive age due to identical hormonal stimulation during intrauterine life (6).

**Diagnosis**:

Detection of fungal antigens: In candidiasis, diagnostic efforts focus on identifying polysaccharide or glycoprotein antigens from the fungal cell wall, as well as intracellular antigens.

**Topical Therapy**:

Topical antifungal agents are available in various formulations, including solution, lotion, gel, and cream. First-line treatments include imidazole derivatives and ciclopirox olamine. Allylamines are considered second-line options.

**Systemic Therapy:**

Indicated in cases of multiple or extensive lesions, recurrent infections, or vulvovaginitis. Systemic treatment is essential in immunocompromised patients and in cases of Chronic Mucocutaneous Candidiasis. Itraconazole is the most commonly used agent for yeast infections and those caused by *Aspergillus* species (7).

For mild to moderate oral infections, topical oral antifungals are commonly used, including imidazole derivatives, amphotericin B, and nystatin, along with aqueous sodium bicarbonate solutions, administered for 7–14 days. For severe infections, treatment typical-

ly involves fluconazole at a dosage of 2–7 mg/kg/day, administered either orally or intravenously (8).

## The three most important things to tell parents

1. Adopt hygienic and behavioral measures aimed at eliminating local and systemic predisposing factors (e.g., increased humidity, dermatitis, maceration, underlying medical conditions), thereby promoting resolution of the condition and preventing recurrence.

2. Ensure proper skin cleansing, keeping the skin dry. In the diaper area, irritant contact dermatitis and skin maceration can be prevented or minimized through the use of topical barrier agents.

3. To prevent vulvovaginitis, maintain meticulous hygiene, avoid aggressive intimate cleansers and occlusive synthetic underwear, and, when possible, limit prolonged antibiotic therapies.

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