

Genito-Urinary System

***Candidiasis &  
Candida albicans***

## ■ The candida

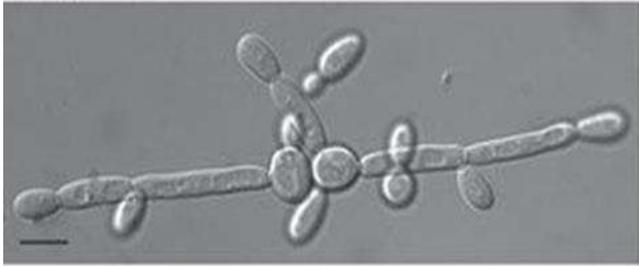
- members of the resident human
- can produce disease ranging from superficial skin or mucous membrane infections to systemic involvement of multiple organs.

- The most common opportunistic infections are caused by the yeast *Candida albicans*
  - a common inhabitant of the gastrointestinal and genital floras

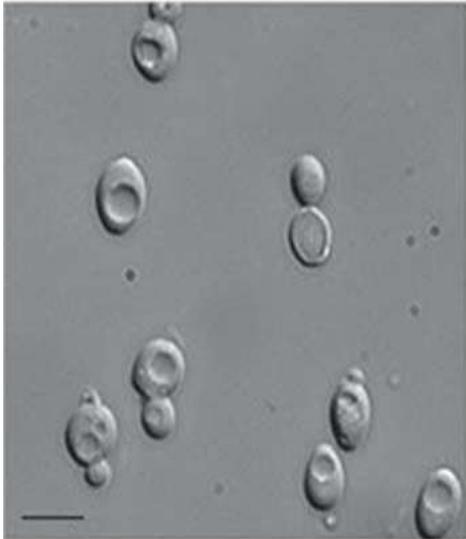
# *Candida albicans*

- *C. albicans* grows in multiple morphologic forms

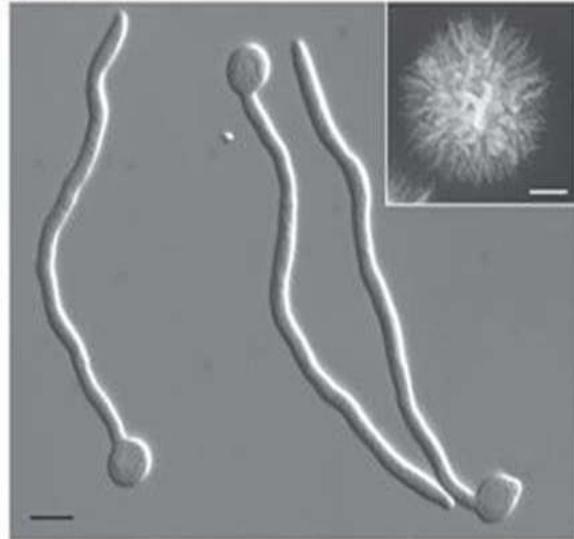
Pseudohyphae



Yeast

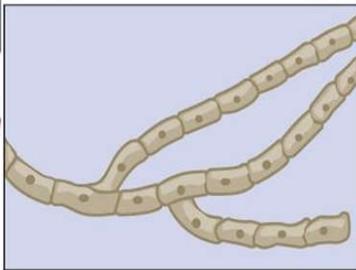


Hyphae

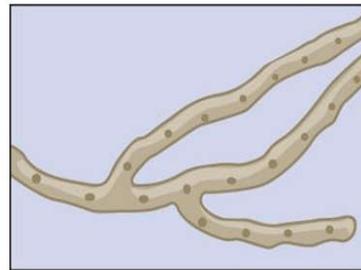


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septate hyphae

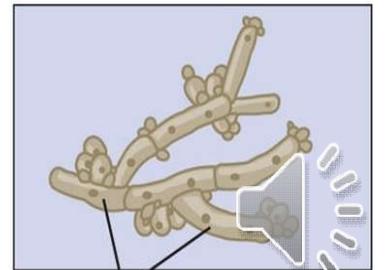


coenocytic (nonseptate) hyphae



molds

pseudohyphae



yeast cells

■ The *C. albicans* cell wall is made up of:

- a mixture of the polysaccharides mannan, glucan, and chitin alone or in complexes with protein.
- The exact composition of the cell wall and surface components varies under different growth and morphologic conditions.

# CANDIDIASIS

- Candidiasis occurs in localized and disseminated forms.
  - Deep tissue and disseminated disease are limited almost exclusively to the immunocompromised.
  - Diffuse pneumonia and urinary tract involvement are especially common.

## EPIDEMIOLOGY

- *C. albicans* is a common member of the oropharyngeal, gastrointestinal, and female genital flora (30-50% of healthy person).
- Infections are endogenous except in cases of direct mucosal contact with lesions in others (eg, through sexual intercourse).
- Although *C. albicans* is a common cause of nosocomial infections, the fungi are also derived more frequently from the patient's own flora.

- Invasive procedures and indwelling devices may provide portal of entry,
- the number of Candida may be enhanced by the use of antibacterial agents.

## PATHOGENESIS

- Because *C. albicans* is regularly present on mucosal surfaces, disease implies a change in the organism, the host, or both.
- Shift from yeast to hyphae is associated with enhanced pathogenic potential of *C. albicans* (invasion).

## PATHOGENESIS

- *C. albicans* hyphae have the capacity to form strong attachments to human epithelial cells, mediated by a surface mannoproteins; hyphal wall protein (Hwp1) found only on surface of germ tubes and hyphae & extracellular matrix.

## ■ Hyphae

- secrete proteinases and phospholipases that are able to digest epithelial cells and facilitate invasion.

- *C. albicans* has protein surface receptors that bind the C3 component of complement in an antiopsonic manner.

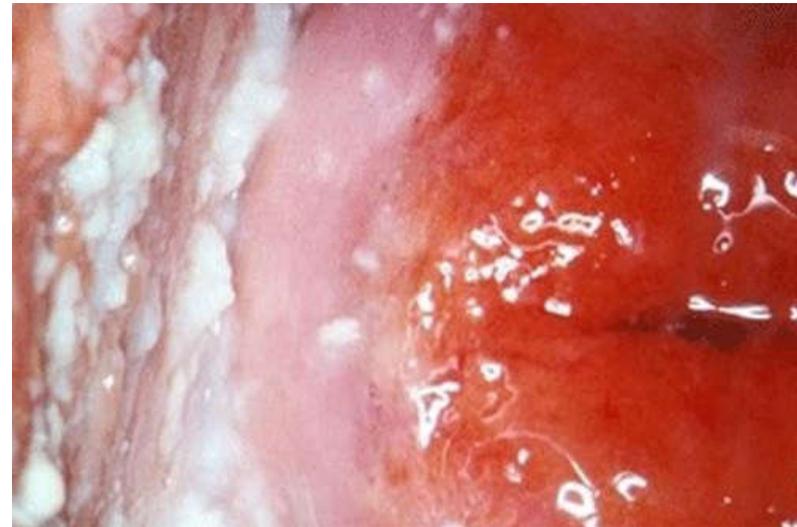
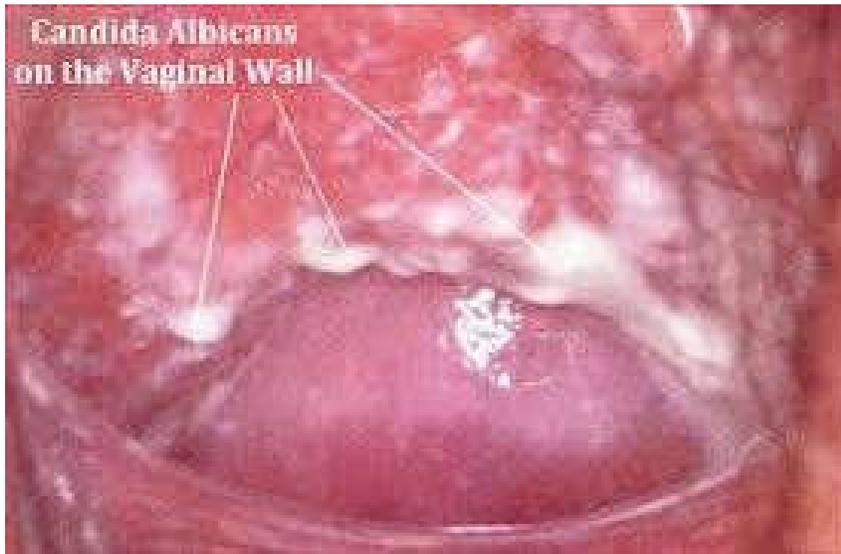
## MANIFESTATIONS

- Superficial invasion of the m. membranes produces a usually painless, white, cheesy plaque called thrush that is loosely adherent to the mucosal surface.



# MANIFESTATIONS

- Vaginal candidiasis (vulvovaginitis) produces a thick, curd-like discharge and itching of the vulva. Vaginitis may be recurrent.



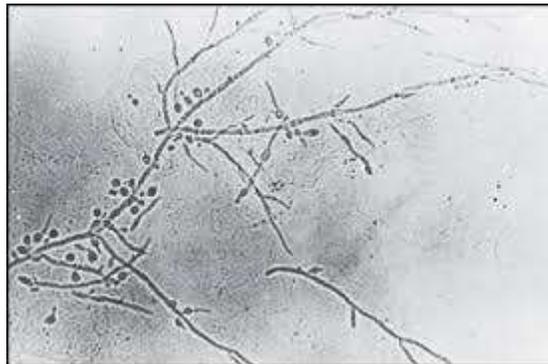
- Chronic mucocutaneous candidiasis is associated with specific T-cell defects.
- Inflammatory patches similar to thrush may develop in the esophagus and intestine with or without associated oral candidiasis.
  - Painful swallowing and substernal chest pain are the most common symptoms

- Urinary tract infections are ascending or hematogenous may produce cystitis, pyelonephritis, abscesses, or expanding fungus ball lesions in the renal pelvis.
- Endophthalmitis appears as white cotton on the retina. Endophthalmitis and infections of other eye structures can lead to blindness.



## DIAGNOSIS

- KOH and Gram smears of superficial lesions show budding yeast and hyphae.
- Cultures from specimens such as sputum run the risk of contamination from the normal flora or a superficial mucous membrane lesion.
- Lung involvement requires a direct aspirate, biopsy, or bronchoalveolar lavage.



## DIAGNOSIS

- Deep organ involvement is difficult to prove without a direct aspirate or biopsy.
- Immunodiagnostic procedures are not routine.

# TREATMENT

*C. albicans* is usually susceptible to:

- **nystatin, amphotericin B, flucytosine, and the azoles.**

Topical **nystatin** or **azoles** generally used for the treatment of superficial lesions.

# TREATMENT

- Deeper infections may resolve spontaneously with elimination or control of predisposing conditions, as an infected catheter or control of diabetes.
  - Amphotericin B, flucytosine, and azoles for invasive disease