# CANDIDAL INFECTION

**DEFINITION**
Infection of the genitalia with Candidal species, usually *C. albicans*, leads to symptoms of burning, soreness, itching, swelling, external dysuria, and abnormal vaginal discharge. Candidal vaginitis is a very common infection; 75% of women will have at least one episode of vulvovaginal candidiasis and 40-45% will have 2 or more infections in their lifetimes. Vulvovaginitis candidosis (VVC) in women is classified as uncomplicated or complicated. Complicated infections are those that are recurrent (≥ 4 episodes/year), severe, involving nonalbicans species, or occurring in women who are immunocompromised. Male infections are less common. Candidal infections occur more often with diabetes and immunosuppression.

**SUBJECTIVE**
May include:
1. Vaginal discharge.
2. Vulvar and/or vaginal itching, burning, pain or soreness.
3. Penile irritation, pruritus.
4. Perianal pruritus or irritation.
5. Dyspareunia.
7. History of recent use of antibiotics, corticosteroids, or chemotherapy.
8. History of diabetes mellitus, HIV, or other immunocompromise.

**OBJECTIVE**
Must include at least one of the following:
1. Erythematous, swollen or excoriated external genitalia with possible fissures.
2. Tender, erythematous vagina.
3. Semi-adherent, curdy, thick white discharge present on vaginal walls, cervix and/or vulva or penis (beneath foreskin).

**LABORATORY**
Must include at least one of the following:
1. Microscopic evaluation of saline-diluted specimen from side wall of vagina or vulvar/penile scraping reveals hyphae or pseudohyphae and/or spores. If difficulty is encountered visualizing organisms due to cellular debris, dilute original specimen with more normal saline or add 10% potassium hydroxide to slide.
2. Gram stain of vaginal discharge may reveal yeast, pseudohyphae or hyphae.
3. Heating vulvar/penile scrapings on glass slides may reveal the hyphae on microscopic exam.
4. May culture if candidal infection in a symptomatic individual is strongly suspected but microscopic tests are negative. Cultures are also recommended for women with complicated VVC to confirm diagnosis and identify nonalbicans species.
   **Note:** Findings of Candida on culture or microscopy does not warrant treatment in an asymptomatic person. Similarly, Candida reported on cervical cytology is not clinically relevant in an asymptomatic woman.

**ASSESSMENT**
Symptomatic Candidal infection of vagina and/or external genitalia.

**PLAN**
1. For women with uncomplicated candidal infections, select any one of the following short course treatments (consider price and patient preference):
   a. Butoconazole 2% cream (single dose bioadhesive product) 5 g intravaginally for 1 day.
   b. Clotrimazole 1% cream 5 g intravaginally daily for 7-14 days.
   c. Clotrimazole 2% cream 5 g intravaginally daily for 3 days.
   d. Miconazole 2% cream 5 g intravaginally daily for 7 days.
   e. Miconazole 4% cream 5 g intravaginally daily for 3 days.
   f. Miconazole 100 mg vaginal suppository, one suppository intravaginally daily for 7 days.
   g. Miconazole 200 mg vaginal suppository, one suppository intravaginally daily for 3 days.
   h. Miconazole 1,200 mg vaginal suppository, one suppository intravaginally for 1 day.
i. Tioconazole 6.5% ointment 5 g intravaginally in a single application.
j. Terconazole 0.4% cream 5 g intravaginally daily for 7 days.
k. Terconazole 0.8% cream 5 g intravaginally daily for 3 days.
l. Terconazole 80 mg vaginal suppository (Terazol) 1 suppository intravaginally daily for 3 days.
m. Fluconazole* 150 mg tablet orally in single dose. (Avoid in pregnancy, but compatible with breastfeeding.)

Notes:
- All topical antifungal agents compromise the integrity of latex barrier contraceptives.
- In pregnancy, only 7-day topical azole therapies are recommended.
- Be aware of possible drug-to-drug interactions with Coumadin, oral hypoglycemic agents (except Metformin), astemizole, calcium channel antagonists, cisapride, cyclosporin, phenytoin, protease inhibitors, tacrolimus, terfenadine, theophylline, trimetrexate and rifampin.
- If the patient has also bacterial vaginosis, topical therapies for candida may not be as effective. Oral therapies for candida preferred, especially if combined with topical BV therapies.

2. For people who are highly symptomatic and have findings consistent with yeast infection but have negative microscopy, empiric treatment with one of the agents listed above may be appropriate. First must clinically rule out other etiologies of symptoms, such as lichen sclerosis or vulvar hyperplasia.

3. For women with severe infections (extensive vulvar erythema, edema, excoriation and fissure formation), strong risk factors (such as, uncontrolled diabetes, immunocompromise, obesity) treat with any of the multiday topical treatments listed in Plan 1, but the duration of therapy SHOULD BE doubled. For example, three-day therapy becomes 6-7-day therapy, 7-day therapy becomes 14-day therapy.

Notes:
- All topical antifungal agents compromise the integrity of latex barrier contraceptives.
- All topical antifungal agents are Category C in pregnancy except Clotrimazole and Nystatin, which are Category B. Clotrimazole and Nystatin are compatible with breastfeeding and the other topical agents are probably compatible.
- *Category C in pregnancy. Be aware of possible drug-to-drug interactions with Coumadin, oral hypoglycemic agents (except Metformin), astemizole, calcium channel antagonists, cisapride, cyclosporin, oral, phenytoin, protease inhibitors, tacrolimus, terfenadine, theophylline, trimetrexate and rifampin. Fluconazole is compatible with breastfeeding.

4. For women with non-albicans candidal infection:
   a. Treat with topical agents as Plan 3 above as first line therapy for 7-14 days.
   b. If recurrence occurs or treatment fails, treat with boric acid 600 mg in gelatin capsule (size “0”) intravaginally daily for 14 days.

5. Women with resistant infections (not responsive to initial therapies but not re-infected), treat with one or both of the following:
   a. Treat with agent for prolonged period of time as outlined in Plan #3.
   b. Apply Gentian violet if available: Paint inside of vaginal vault and vulva with 1% gentian violet (CONTRAINDICATED IN PREGNANCY). Permit agent to dry thoroughly. Follow with one of the topical treatments listed in Plan #3. If patient responding, may repeat gentian violet treatments once a week for a total of 3 treatments. If not responding, refer to MD.

6. For women with recurrent infections (>4/year): If patient complains of dryness, usually topical antifungal agent will provide relief, but may consider Domeboro solution soaks.
   a. Evaluate immune status (review medications, HIV status, etc.).
   b. Obtain vaginal cultures to confirm clinical diagnosis and to identify unusual species, if indicated.
   c. Refer partner for evaluation and treatment, if indicated.
   d. Re-evaluate patient for other causes of genital irritation, (e.g., lichen sclerosis, vulvar hyperplasia, VIN).
   e. After other problems ruled out, if patient troubled by recurrent infections, treat with 7-14 days...
of topical treatment using options listed in Plan #2 above or Fluconazole 150 mg orally days 1, 4, 7 to achieve remission. Obtain a test of cure to demonstrate clearance. Then offer maintenance regimens with one of the following:

1) Recommended regimen:
   a) Fluconazole* (Diflucan) with 100 mg, 150 mg, or 200 mg dose orally once a week for up to 6 months.
   b) Alternative regimens with topical treatments used intermittently, such as clotrimazole one application 1-2 times a week for 6 months.
   c) One study has shown that vaginal nystatin suppositories given 14 days a month was as effective as Fluconazole for suppressing recurrent albican infection and more effective in suppressing nonalbican infection.

2) For HIV-infected women with recurrent vulvovaginal candidiasis, use fluconazole* 200mg orally once a week for up to 6 months. Consult MD if longer treatment needed.

* Category C in pregnancy but compatible with breastfeeding. Be aware of possible drug-to-drug interactions with Coumadin, oral hypoglycemic agents (except Metformin), astemizole, calcium channel antagonists, cisapride, cyclosporin A, phenytoin, protease inhibitors, tacrolimus, terfenadine, theophylline, trimetrexate and rifampin.

7. Men with candidal infections of external genitalia may use clotrimazole 1% twice a day or Nystatin four times a day to affected area for 7-14 days. Specific treatment should be guided by the severity of the symptoms, immune status, and organisms involved.
8. If patient has severe or recurrent candidal infections, inspect oral cavity for evidence of thrush. (Consult MD).
9. If woman reports that her partner is symptomatic, recommend that individual be evaluated or try course of over-the-counter antifungal mediation.

### PATIENT EDUCATION

| 1. | Stress importance of completing medication even during menses. |
| 2. | Advise patient that antifungal creams/suppositories may reduce integrity of latex barrier methods. Recommend condom users utilize non-latex condoms, abstinence or other method during use of topical antifungal therapies. Vaginal contraceptive ring use is compatible with topical antifungal use. |
| 3. | Counsel on importance of genital hygiene. Consider use of cotton or dermasilk materials. Avoid tight synthetic underwear. |
| 4. | If gentian violet used, caution patient regarding staining of underclothing or bed sheets. |
| 5. | Advise patient not to use tampons during treatment with vaginal cream. |
| 6. | RTC if symptoms persist. |
| 7. | Refer partner for treatment, if symptomatic. |
| 8. | Advise patient that OTC remedies should be self-prescribed in the future only if the signs and symptoms are very similar to the current complaints and if the patient is at low risk for STIs. Advise women not to self-diagnosis or self-treat during pregnancy. |
| 9. | Advise against douching. |
| 10. | Evaluate appropriateness of diet (high sugar and carbohydrate elements). |

### REFER to MD/ER

| 1. | Persistent or recurrent infection unresponsive to treatments. |
| 2. | Extreme excoriation or superinfection. |

### REFERENCES

5. Donders GG, Bellen G, Mendling W. Management of recurrent vulvo-vaginal candidosis as a