DIFFERENTIATION OF COMMON VAGINAL INFECTIONS.

قال رسول الله صلى الله عليه وسلم : ما من خارج خرج من بيته
في طلب العلم إلا وضعت له الملائكة اجنحتها رضا بما يصنع

TABLE 8-1 Differentiation of Common Vaginal Infections

Classic Symptoms[1]	Differentiating Signs and Symptoms	Etiology and Epidemiology[1]
Bacterial Vaginosis		
Thin (watery), off-white or discolored (green, gray, tan), sometimes foamy discharge; unpleasant "fishy" odor that increases after sexual intercourse or with elevated vaginal pH (e.g., menses)	Vaginal irritation, dysuria, and itching less frequent with BV than with VVC or trichomoniasis[19] Malodor strongly associated with BV; absence of malodor virtually rules out BV Increased vaginal discharge ("wetness") more common with BV than with VVC or trichomoniasis	Polymicrobial infection resulting from imbalance in normal vaginal flora with increase in *G. vaginalis* and anaerobes (*Peptostreptococcus, Mobiluncus, Prevotella,* and *Mycoplasma hominis*) and decrease in lactobacilli Risk factors: new sexual partner, African American race, use of IUD, douching, receptive oral sex, tobacco use (smoking alters vaginal flora), and prior pregnancy Possible protective factors: use of female hormones, including OC, and condoms Responsible for 33% of vaginal symptoms Predominately affects young sexually active women but can arise spontaneously regardless of sexual activity; found in 12% of virginal adolescents; lower prevalence in postmenopausal women, even with use of postmenopausal hormones

Classic Symptoms[1]	Differentiating Signs and Symptoms	Etiology and Epidemiology[1]
Trichomoniasis		
Copious, malodorous, yellow-green (or discolored), frothy discharge; pruritus; vaginal irritation; dysuria No symptoms initially in ~50% of affected women Most men are asymptomatic and serve as reservoirs of the disease	Erythema and vulvar edema can occur with this infection[9] Yellow discharge: increased likelihood of trichomoniasis	STI caused by *Trichomonas vaginalis*, a protozoan Risk factors: multiple sex partners, new sexual partner, nonuse of barrier contraceptives, and presence of other STIs Responsible for 15%–20% of vaginal infections

Classic Symptoms[1]	Differentiating Signs and Symptoms	Etiology and Epidemiology[1]
Vulvovaginal Candidiasis		
Thick, white ("cottage cheese") discharge with no odor; normal pH (see text for detailed information; also referred to as "yeast infection" or "moniliasis")	Presence of erythema, itching, and/or vulvar edema, and absence of malodor: increased likelihood of VVC; thick, "cheesy" discharge: strongly predictive of VVC[9,18]	Organisms: *C. albicans*, *Candida glabrata*, *Candida tropicalis*, and *Saccharomyces* Some medications: antibiotics, immunosuppressants No identifiable cause for most infections Responsible for 20%–25% of vaginal infections

Pathophysiology

Vulvovaginal candidiasis (also referred to as "yeast infection" and "moniliasis") is second only to BV as the most common vaginal infection, accounting for approximately 20% to 25% of cases of vaginitis. VVC is uncommon prior to menarche, but by age 25 about 50% of women will have had one or more episodes of VVC.[6] A study of 2000 women found that 6.5% of women

Candida fungi are the causative organisms of this vaginal infection, with about 80% to 92% of cases caused by *C. albicans*.[3] The incidence of non–*C. albicans* infections has increased in the past two decades; *Candida glabrata*, *Candida tropicalis*, and *Saccharomyces cerevisiae* now account for a significant minority of candidal vaginal infections.[3,7] This increase may be a result of the widespread use of nonprescription antifungals, short courses of azole therapy, and long-term suppressive therapy with azole antifungals.[3]

Risk factors

Pregnancy, high-dose estrogen oral contraceptives, and estrogen replacement therapy (ERT) may increase vaginal susceptibility to candidal infections by increasing the glycogen content of the vagina. However, studies do not support an increased risk for candidal infections with low-dose estrogen oral contraceptives, and studies on risk during pregnancy or use of postmenopausal ERT are inconsistent.[20,21] Vaginal pH increases during menstruation, which may predispose menstruating women to cyclic fungal vaginal infections. During the reproductive years, the vaginal epithelium cells are thick and contain an abundant amount of glycogen.[22] These cells exfoliate and continually provide the lactobacilli with the glycogen to produce lactic acid.[22] At menopause, there is a decline in glycogen caused by a decrease in epithelial cells, leading to a decrease in lactic acid production and an increase in vaginal pH, which can alter vaginal ecology and may also predispose to vaginal infections. Women with diabetes mellitus are known to be at greater risk for skin and vaginal candidal infections, particularly if glycemic control is poor.

Risk factors (cont)

- Broad spectrum antibiotics (tetracycline, ampicillin, amoxicillin, cephalosporin)
- ***Patients taking antineoplastic agents , systemic corticosteroids , immunosuppressant drugs***
- **Onset of regular sexual activity**
- ***Tight fitting non-absorbent clothing and pantyhose*** (studies don't demonstrate consistent association . However, clothing of this type may increase risk by creating moist and warm environment)

Treatment goals

- Relief of symptoms
- Eradication of infection
- Reestablishment of normal vaginal flora

General treatment approach

- SELF TREATMENT is a appropriate for uncomplicated infection

Uncomplicated infection — Criteria for uncomplicated infection include all of the following

- Sporadic, infrequent episodes (≤3 episodes/year)
- Mild to moderate signs/symptoms
- Probable infection with *Candida* albicans
- Healthy, non-pregnant woman

General treatment approach

- Recurrent infection often require long term suppressive prophylactic therapy (in addition , frequent or recurrent VVC may be an early sign of HIV infection or diabetes

The food and drug administration FDA now require labels of non-prescription products to include a warning similar to the following

> Symptoms that return within 2 months or infections that do not clear up easily with proper treatment require medical evaluation. Possible causes of the infection include pregnancy or a serious underlying medical disorder, such as diabetes or a damaged immune system (including damage from infection with HIV, the virus that causes acquired immunodeficiency syndrome).

Diagnosis of VVC

Exclusions for Self-Treatment

- Pregnancy
- Girls <12 years
- Concurrent symptoms: fever or pain in the lower abdomen, back, or shoulder
- Medications that can predispose to VVC: corticosteroids, antineoplastics
- Medical disorders that can predispose to VVC: DM, HIV infection
- Recurrent VVC (i.e., >3 vaginal infections per year or vaginal infection in past 2 months)

Diagnosis of VVC

Self-treatment of VVC with nonprescription antifungal therapy can be appropriate for patients with uncomplicated disease (infrequent episodes, mild-to-moderate symptoms), whereas women with complicated (more severe symptoms, or concurrent predisposing illness or medications) or recurrent infections should be referred for assessment and treatment by a primary care provider.

Diagnosis of VVC

The symptom most apt to differentiate a candidal vaginal infection from that of bacterial vaginosis and trichomoniasis is the absence of an offensive odor of the vaginal discharge.[16]

The characteristic signs, symptoms, and complications of VVC are described in Table 8-1. Fungal vaginal infections typically do not affect vaginal pH, whereas a pH greater than 4.5 indicates a bacterial or trichomonal vaginal infection. Vaginal pH testing

Diagnosis of VVC

By definition, recurrent VVC occurs when a woman experiences at least four (documented) infections within a 12-month period.[3] Patients with such symptoms should be evaluated for the possibility of a mixed infection or a strain of candidal infection other than *C. albicans*, which may be resistant to standard therapy. Recurrent candidal infections often require long-term suppressive prophylactic therapy. About two-thirds of surveyed physicians report seeing patients who had delayed treatment because of inappropriate use of nonprescription products.[24] In addition, frequent or recurrent episodes of VVC may be an early sign of HIV infection or diabetes. The Food and Drug Admin-

Preventive measures

Preventive measures are not a standard part of therapy for vaginal fungal infections. However, women with infections that are more frequent or are not responsive to antifungal therapy may try dietary changes; nondrug measures (e.g., avoidance of nonabsorbent clothing); or alteration in other drug therapy known to be a risk factor for VVC. A 3- to 4-month trial of these approaches will reveal whether they are useful for individual patients.[1] Figure 8-1 outlines the appropriate approach to treating the patient with vaginal symptoms.

Non-pharmacologic treatment

Decreased consumption of sucrose and refined carbohydrates, as well as consumption of yogurt containing live cultures (see Complementary Therapies), have been suggested as measures to decrease VVC, particularly for women who experience recurrent infections.[1,2,25]

Discontinuing a drug known to increase susceptibility to vaginal fungal infections might be effective in decreasing the incidence of this disorder. Low-dose oral contraceptives are unlikely to contribute to the occurrence of VVC, but they might be discontinued to see whether the frequency of infection is altered. Patients taking broad-spectrum antibiotics or immunosuppressants should consult their primary care provider before discontinuing these medications.

Pharmacologic treatment/ vaginal anti-fungals

Currently , nonprescription FDA approved imidazole (butoconazole, clotrimazole, miconazole, tioconazole) product is the recommended initial therapy for uncomplicated VVC and releif of external vulular itching and irritation associated with the infection

Treatment of uncomplicated vaginal candidiasis

Drug and trade name (s)	Requires a prescription in US	Preparation	Intravaginal* dose for adult
Clotrimazole			
Gyne-Lotrimin•	No	1 percent cream	1 applicatorful (~5 g) daily for 7 days
Gyne-Lotrimin 3•	No	2 percent cream	1 applicatorful (~5 g) daily for 3 days
Gyne-Lotrimin△	Not applicable (not available in US)	100 mg vaginal tablet△	Insert 1 vaginal tablet daily for 7 days or 2 tablets daily for 3 days
Miconazole			
Monistat 7•	No	2 percent cream (combination kit may include 2 percent miconazole cream for external use)	1 applicatorful (~5 g) daily for 7 days
Monistat 3•	No	4 percent cream	1 applicatorful (~5 g) daily for 3 days
Monistat 7•	No	100 mg vaginal suppository	1 suppository daily for 7 days
Monistat 3•, Vagistat-3	No (combination kit) Yes (generic suppository)	200 mg vaginal suppository (combination kit may include 2 percent miconazole cream for external use)	1 suppository daily for 3 days
Monistat 1	No	1200 mg vaginal suppository (combination kit may include 2 percent miconazole cream for external use)	1 suppository for 1 day
Nystatin◇			
Nystatin vaginal△ (former US trade name Mycostatin)	Not applicable (not available in US)	100,000 unit vaginal tablet	Insert 1 vaginal tablet daily for 14 days
Terconazole¥			
Terazole 7, Zazole•	Yes	0.4 percent cream	1 applicatorful (~5 g) daily at bedtime for 7 days
Terazole 3, Zazole•	Yes	0.8 percent cream	1 applicatorful (~5 g) daily at bedtime for 3 days
Terazole 3, Zazole•	Yes	80 mg vaginal suppository	1 suppository daily at bedtime for 3 days
Tioconazole			
Vagistat-1, 1-Day (from Monistat)•	No	6.5 percent ointment	1 applicatorful (~5 g) at bedtime as a single dose
Butoconazole			
Gynazole-1	Yes	2 percent cream	1 applicatorful (~5 g) as a single dose
Fluconazole ORAL ADMINISTRATION§			
Diflucan•	Yes	150 mg oral tablet	Single dose by mouth

There are no significant differences in efficacy among topical and systemic azoles (cure rates >80 percent for uncomplicated vulvovaginal candidiasis).

g: grams.
* Except fluconazole (oral administration).
• Generic equivalent preparation(s) are available in US.
△ Not available in US.
◇ Cure rate with nystatin is 70 to 80 percent.
§ Itraconazole is another oral antifungal that appears to be effective. Pitsouni E, et al. Am J Obstet Gynecol 2008; 198:153.
¥ Rare cases of anaphylaxis and toxic epidermal necrolysis have been reported during terconazole therapy.

Side effects

Side effects from topical imidazoles are minimal and include vulvovaginal burning, itching, and irritation in 3% to 7% of patients.[20] These side effects are more likely to occur with the initial application of the vaginal preparation and are similar to symptoms of the vaginal infection. Abdominal cramps (3%), penile irritation, and allergic reactions (3%–7%) are uncommon, and headache may occur in up to 9% of women.[1]

Drug therapy

Studies have shown the imidazoles to be equally effective, with effectiveness rates of approximately 80% to 90%.[3,6] Different treatment durations have been studied. Miconazole single-dose and 7-day treatments were compared, resulting in similar overall cure rates with significantly faster rates of symptom relief by day 3 in the 3-day group compared with the 7-day treatment

Drug therapy/ Special populations

Treatment of VVC in pregnancy should consist of one of the imidazoles (butoconazole, clotrimazole, or miconazole); however, when possible, withholding treatment during the first trimester may be preferable.[32] Self-treatment during pregnancy is not appropriate. Prescriber assessment is important to evaluate for complications (e.g., elevated blood sugar) and to assess for other vaginal organisms, because bacterial vaginosis and trichomoniasis have the potential for adverse pregnancy outcomes. Breast-feeding women can use any of the nonprescription vaginal antifungals.[20]

Drug therapy/ selecting an antifungal

Selection of cream, tablet, or suppository formulations can be left to patient preference; some patients may prefer the convenience of prefilled applicators. Studies have found that women who have previously experienced VVC prefer shorter courses of therapy than do women who have not had a prior infection; physicians tend to prefer longer courses of therapy.[1]

If vulvar symptoms are significant, a cream preparation, or the combination of a cream with vaginal suppositories or tablets is preferred.

Complementary therapy

An alternative approach to treating VVC is the use of *Lactobacillus* preparations. The rationale for use of these preparations is to reestablish normal vaginal flora and inhibit overgrowth of *Candida* organisms. Data on the effectiveness of this approach are limited; one study that treated five women with positive vaginal cultures for *C. albicans* found 4 of the 5 women had negative cultures after administration of *Lactobacillus* GG suppositories for 7 days.[25] However, another study examining the usefulness of *Lactobacillus* and other probiotic bacteria administered orally, vaginally, and by both routes found that none of the regimens protected against the development of postantibiotic VVC.[33] However, eating yogurt with live cultures (8 ounces daily) may be of some benefit in preventing recurrent VVC.[25] (For more information on probiotics,

Complementary therapy

Home remedies such as vaginal douches of yogurt or vinegar have also been used to treat this condition but are generally not effective. However, use of a sodium bicarbonate sitz bath may provide prompt relief of vulvar irritation associated with a candidal vaginal infection before antifungal agents can provide benefit[21,34]:

- Add 1 teaspoon sodium bicarbonate to 1 pint of water.
- Add 2 to 4 tablespoons of the solution to 2 inches of bath water.
- Sit in the sitz bath or bathtub for 15 minutes as needed for symptom control.

Practitioners can advise patients when it is appropriate to self-treat for vaginal symptoms consistent with VVC, and when medical evaluation, including pelvic examination and laboratory examination of vaginal secretions, is indicated. Self-treatment is most appropriate when the woman meets the following four criteria:

1. Vaginal symptoms are infrequent (i.e., no more than three vaginal infections per year and no vaginal infection within the past 2 months).
2. At least one previous episode of VVC was medically diagnosed.
3. Current symptoms are mild to moderate, and consistent with the characteristic signs and symptoms of VVC—in particular, a nonmalodorous discharge.
4. If measured, vaginal pH should be 4.5 or lower.

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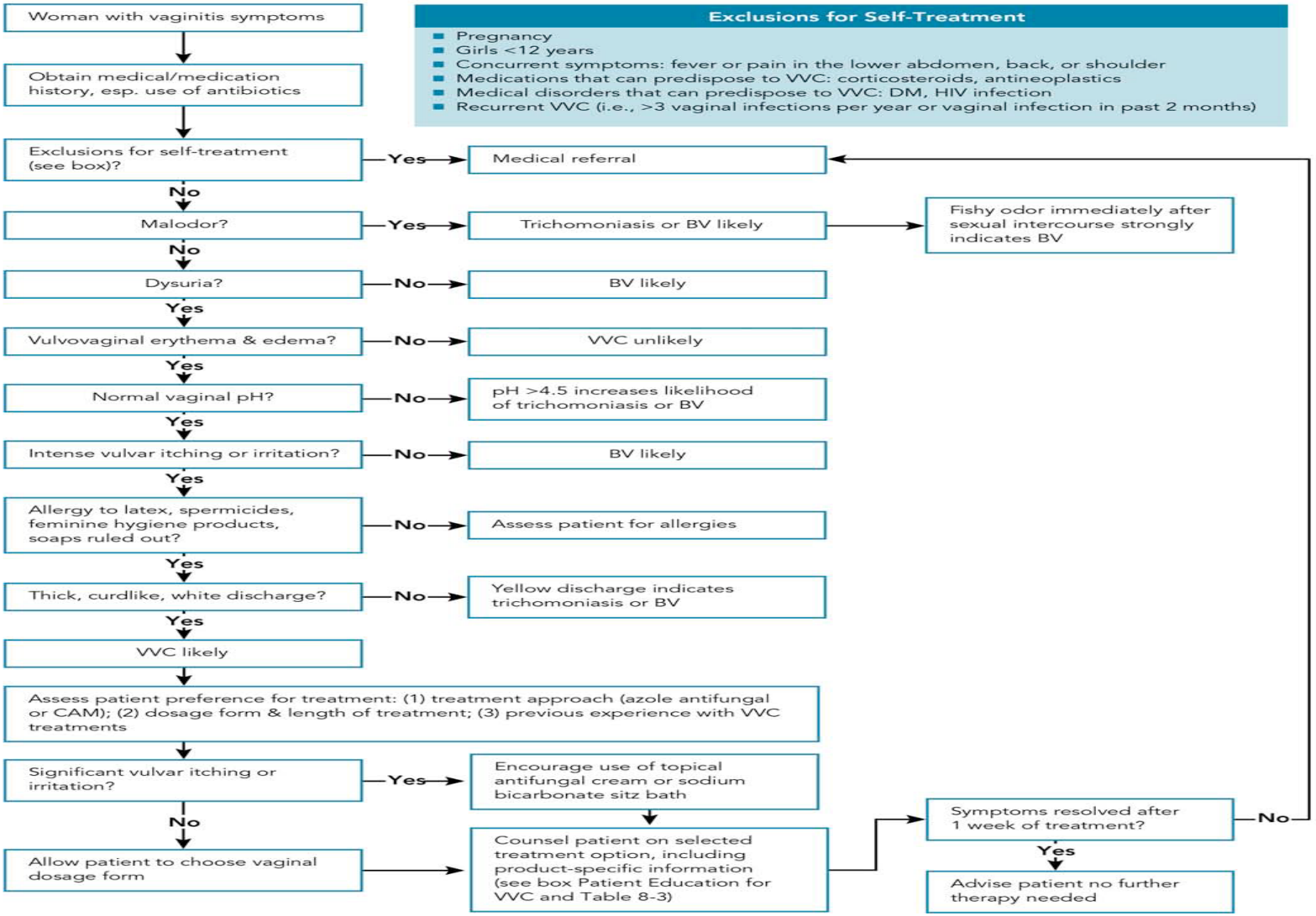
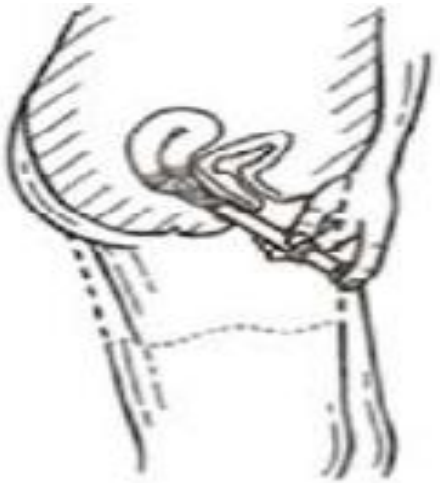


FIGURE 8-1 Self-care of vulvovaginal candidiasis.[9,18,19] Key: CAM, complementary and alternative medicine; DM, diabetes mellitus; HIV, human immunodeficiency virus; VVC, vulvovaginal candidiasis.

TABLE 8-3 Guidelines for Applying Vaginal Antifungal Products

1. Start treatment at night before going to bed. Lying down will reduce leakage of the product from the vagina.
2. Wash the entire vaginal area with mild soap and water, and dry completely before applying the product.
3. *Vaginal cream:* (If prefilled applicators are being used, skip to step 4.) Unscrew the cap; place the cap upside down on the end of the tube. Push down firmly until the seal is broken. Attach the applicator to the tube by turning the applicator clockwise. Squeeze the tube from the bottom to force the cream into the applicator. Squeeze until the inside piece of the applicator is pushed out as far as possible and the applicator is completely filled with cream. Remove the applicator from the tube. *Vaginal tablets/suppositories:* Remove the wrapper and place the product into the end of the applicator barrel.

4. While standing with your feet slightly apart and your knees bent, as shown in drawing A, or while lying on your back with your knees bent, as shown in drawing B, gently insert the applicator into the vagina as far as it will go comfortably.
5. Push the inside piece of the applicator in and place the cream as far back in the vagina as possible. To deposit vaginal tablets/suppositories, insert the applicator into the vagina and press the plunger until it stops.
6. Remove the applicator from the vagina.
7. After use, recap the tube (if using cream). Then clean the applicator by pulling the two pieces apart and washing them with soap and warm water.
8. If desired, wear a sanitary pad to absorb leakage of the vaginal antifungal. Do not use a tampon to absorb leakage.



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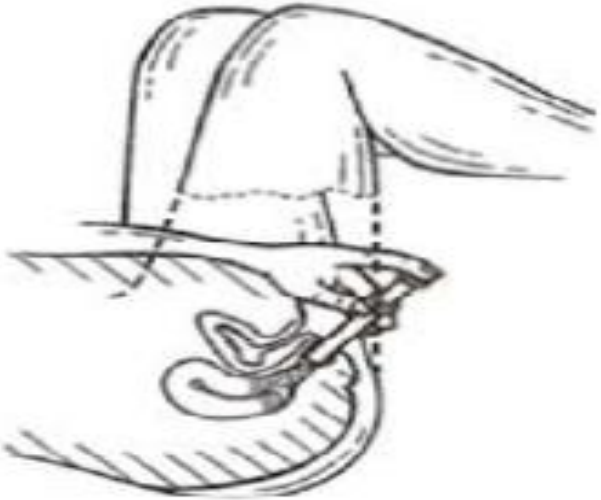

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Seek medical attention if symptoms do not improve within 3 days, or if symptoms persist beyond 7 days.

Seek medical attention if vaginal symptoms worsen or change, especially if the vaginal secretions begin to smell bad, become frothy, or discolored; or other symptoms (e.g., abdominal tenderness) occur. These events may indicate that the *Candida* (yeast) organisms are resistant to the nonprescription therapy or that another type of vaginal infection is present.

Antifungals in Jordan

- Clotrimazole cream and vaginal tabs (canesten, clotrim, clotrex, Dermatin, Gyne-clotrimox vaginal tabs, Myco-hermal)
- Econazole vaginal ovules ,cream, powder, spray, lipogel, lotion (Ecomi, Ecorex, gyno-pevaryl, Pevaryl, Pevison (with triamcinolone)
- isoconazol cream (azonit, travocort, vocort, vocozol)
- Miconazole vaginal cream, ovules ,suppositories (mycoderm, mycoheal, candicort, candizol, daktacor, dactarin, micover, mikozal

Antifungals in Jordan

- Sertaconazole cream, solution , powder (Dermofix)
- Fluconazole capsules, (candivast, diflazol, diflucan, flucand, flucoheal)
- Itraconazole capsules (conazol, sporal, sporavast)

Nondrug Measures

- If significant irritation of the vulva is present, use a sodium bicarbonate sitz bath to provide relief and give the antifungal medication time to become effective.
- If you have recurrent infections, try eating yogurt (1 cup per day of live culture yogurt), and decreasing sugar and refined carbohydrates in your diet.

Nonprescription Medications

- Insert the antifungal product into the vagina once a day, preferably at bedtime to minimize leakage from the vagina. Use a sanitary pad or panty liner to avoid staining of underwear.
- See Table 8-3 for instructions on administering vaginal antifungals. You should have significant relief of symptoms within 24–48 hours. Some relief is often apparent within hours after the first dose. However, the length of treatment (particularly for 1- to 3-day treatments) does not directly correspond to the time of resolution of symptoms.
- Continue the therapy for the recommended length of time, even if your symptoms are gone. Stopping treatment early is one of the most common reasons for recurrence of vaginal symptoms and, possibly, occurrence of difficult-to-treat organisms.
- Note that vaginal antifungals can be used during a menstrual period. If desired, wait and treat the infection after menses ends. Do not, however, interrupt a course of therapy because your period begins.
- Do not use tampons or douche while using a vaginal antifungal product and for 3 days after use.

- Although side effects are uncommon, the first dose of the antifungal may cause some vaginal burning and irritation, and a few women (about 1 in 10) experience a headache.
- Refrain from sexual intercourse during treatment with the vaginal antifungal. Vaginal lubricants and vaginal spermicides should not be used at the same time as the vaginal antifungal. Vaginal antifungals can damage latex condoms and diaphragms, and may result in unreliable contraceptive effects. Do not use these contraceptives during therapy or for 3 days after therapy, because the antifungal medication remains in the vagina for several days.

Consult Physician First

- Do not use vaginal antifungals if
  - —You are less than 12 years old.
  - —You are pregnant.
  - —You have diabetes mellitus, are HIV-positive or have AIDS, or have impaired immune function, including use of medications that may impair function of the immune system.
- If you are breast-feeding, consult a primary care provider before using a vaginal antifungal.

Seek medical attention if symptoms do not improve within 3 days, or if symptoms persist beyond 7 days.

Seek medical attention if vaginal symptoms worsen or change, especially if the vaginal secretions begin to smell bad, become frothy, or discolored; or other symptoms (e.g., abdominal tenderness) occur. These events may indicate that the *Candida* (yeast) organisms are resistant to the nonprescription therapy or that another type of vaginal infection is present.