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# Vaginal Infections

by Mike Boivin, BSc. Pharm

## Learning Objectives:

Upon successful completion of this continuing education lesson, the pharmacy technician will be able to:

1. Discuss the defences the vagina has to prevent vaginal infections
2. Discuss the most common causes of vaginal infections, their risk factors and appropriate treatments
3. Help identify patients that are inappropriately selecting OTC treatment and self-care products
4. Work within the collaborative care practice model to ensure patients are provided with information on appropriate treatment of vaginal infections.

## Introduction

With the change in the prescription status in most provinces, oral fluconazole 150 mg is now an over-the-counter (OTC) treatment option for patients with vaginal yeast infections.

Unfortunately, one study demonstrated that only one-third of women purchasing OTC products actually had a yeast infection and close to 14% had no infection.<sup>1</sup> This demonstrates a need for pharmacists and technicians to clearly understand the different types of vaginal infections, and to be able to identify patients who are inappropriately treating an infection or making it worse with the product they're using.

## The Vaginal Tract

The vagina contains a large number of healthy bacteria that help ensure an optimal vaginal environment. Most of the bacteria are *Lactobacillus* species, which account for more than 95% of all the bacteria present in the normal vaginal flora.<sup>2</sup> These bacteria are crucial for maintaining the normal acidic vaginal pH (3.8 to 4.2) by producing lactic acid; they also produce hydrogen peroxide, which suppresses the growth of other bacteria and yeast.<sup>3</sup> Although potentially infectious bacteria and yeast can be found in the vaginal tract of many women, the *Lactobacillus* keeps them from multiplying and causing a vaginal infection.

## Vaginitis

Vaginitis (inflammation of the vagina) is one of the most common gynecological conditions for which women seek medical care.<sup>4</sup> In the U.S., it is estimated that approximately 10 million office visits per year are due to changes in vaginal discharge.<sup>4</sup> Many conditions, such as a lack of estrogen (atrophic vaginitis) or exposure to chemicals that produce allergic reactions (allergic vaginitis), can cause inflammation in the vagina. However, infectious vaginitis is the most common cause, with bacterial vaginosis, vaginal candidiasis and trichomoniasis being the most frequent types of infectious vaginitis.

## Bacterial Vaginosis

Bacterial vaginosis is the most common form of infectious vaginitis.<sup>2</sup> Contrary to popular public belief, bacterial vaginosis is twice as common as vaginal candidiasis (yeast infection).<sup>5</sup> This condition is caused by a decrease in the number of protective healthy bacteria (*Lactobacillus* species) and an increase in other bacteria (*Gardnerella vaginalis*, *Mycoplasma hominis* and others).<sup>2</sup> The exact incidence of bacterial vaginosis depends on the population. A typical private office sees a prevalence ranging from 4-17%, but it can be as high as 61% in women attending a sexually transmitted disease clinic.<sup>2</sup> Overall bacterial vaginosis accounts for 10-30%

of the cases of infectious vaginitis in women of childbearing age.<sup>4</sup>

More than 50% of the women with bacterial vaginosis are asymptomatic (have no symptoms).<sup>3</sup> The only consistent symptom is foul- or fishy-smelling vaginal discharge.<sup>3</sup> This odour is the result of metabolic by-products of the bacteria causing the infection and is stronger during menses and after intercourse.<sup>3</sup> The discharge is usually thin, milky white or dark or dull grey, homogeneous (uniform composition) and sticks to the vaginal wall.<sup>3</sup> Vaginal itching and irritation is not common with bacterial vaginosis (approximately 15% of cases).<sup>3</sup>

Risk factors for bacterial vaginosis include new or multiple sex partners, early age of first intercourse, use of an intrauterine device, vaginal douching, race, recent antibiotic use and women who smoke.<sup>2,5</sup> Bacterial vaginosis is particularly prevalent among lesbian women.<sup>5</sup> It is not considered a sexually transmitted infection and routine treatment of male partners is not required.<sup>3</sup>

For most patients, the relative risk of complications from bacterial vaginosis is very small (although patients with bacterial vaginosis may be at higher risk of contracting HIV). In pregnant women, bacterial vaginosis infection is associated with a significant number of obstetric and gynecologic complications, such as preterm labour and delivery, preterm premature rupture of membranes, spontaneous abortion, post-cesarean delivery wound infections, postsurgical infections and subclinical pelvic inflammatory disease.<sup>2</sup>

There are no over-the-counter treatments for bacterial vaginosis. The most effective treatment regimen for bacterial vaginosis is metronidazole 500 mg orally BID for seven days.<sup>4</sup> Other treatment regimens include:<sup>6</sup>

- Metronidazole 0.75% vaginal gel one applicatorful once daily for 5 days
- Clindamycin 2% vaginal cream one applicatorful once daily for 7 days
- Metronidazole 2 g as a single oral dose

Vaginal treatments have been shown to be as effective as oral metronidazole and they lack the systemic adverse effects of metronidazole (e.g. nausea, vomiting, headache, metallic taste).<sup>3</sup> Patients taking oral metronidazole should avoid alcohol while on the medication and for 48 hours

after completing it, due to the risk of developing a reaction characterized by nausea, vomiting, flushing, rapid heart rate and shortness of breath.<sup>7</sup>

More than 50% of women may have a recurrence of bacterial vaginosis within two months of antibiotic treatment for bacterial vaginosis.<sup>5</sup> Asymptomatic patients do not require treatment unless they are pregnant and have a history of preterm delivery.<sup>2,4</sup>

### Vaginal Candidiasis

Vaginal candidiasis (yeast infection) is the second most common form of infectious vaginitis.<sup>8</sup> It is estimated that 75% of women experience this infection at some time during their reproductive lives.<sup>7</sup> More than 40% of affected women will have two or more vaginal candidiasis infections in their lifetime.<sup>9</sup>

Like bacterial vaginosis, the yeast that causes this infection (usually *Candida albicans*) is found as part of the normal vaginal flora in 20% of women and will only start to cause a problem if it overgrows the healthy bacteria in the vagina through a breakdown in vaginal defences.<sup>7</sup> These defences can be compromised by the current or recent use of antibiotics, pregnancy, poorly controlled diabetes, excessive heat and moisture from wearing synthetic undergarments and HIV infection.<sup>7</sup> There is no evidence that combined oral contraceptives cause vaginal yeast infections.<sup>6</sup>

Patients with vaginal candidiasis normally have vaginal or vulvar (external) itching (50% of patients), vulvar or vaginal swelling (24% of patients) and burning on the outside of the urethra upon urination (33% of patients).<sup>4</sup> The symptoms are often worse the week before menses onset.<sup>3</sup> The non-malodorous discharge is normally white, cottage cheese-like lumps that will adhere to the vaginal walls and external tissue.<sup>3</sup>

Vaginal candidiasis can be successfully treated with various OTC preparations, as outlined in Table 1. Many women may prefer the simplicity of oral fluconazole 150 mg as a single dose.<sup>4</sup> It has been shown to be as effective as a standard course of vaginal clotrimazole but may cause mild gastrointestinal (stomach) upset, headache, dizziness and rash in some patients.<sup>4</sup> All standard treatments for uncomplicated vaginal candidiasis are equally effective and result in a cure rate of approximately 80%.<sup>4</sup> The choice of a particular product is based on the patient's

**TABLE 1 – MOTC Treatment Regimens for Vaginal Candidiasis<sup>10-12</sup>**

#### Clotrimazole:\*

- 1% vaginal cream for 6 days
- 2% vaginal cream for 3 days
- 10% vaginal cream for 1 day
- 500 mg vaginal tablet for 1 day
- 200 mg vaginal tablet for 3 days

#### Miconazole:\*

- 2% vaginal cream for 7 days
- 4% vaginal cream for 3 days
- 100 mg vaginal ovule for 7 days
- 400 mg vaginal ovule for 3 days
- 1200 mg vaginal ovule for 1 day

#### Fluconazole

- 150 mg oral capsule single dose [not recommended in pregnancy]

\* All regimens are 1 applicator full of cream intravaginally or 1 vaginal ovule/tablet once daily

previous trials with a product, the patient's preference for the type of product (cream, suppository) and the preferred route of administration (oral, vaginal). Women should expect symptoms to begin to improve within three days and when they should expect symptoms to resolve within seven days.

Women with recurrent vaginal infections or uncontrolled diabetes and those who are HIV positive or debilitated should be given an extended course (7-14 days) of a vaginal product as they are more effective than shorter courses or single-dose fluconazole.<sup>4</sup> For pregnant women with vaginal candidiasis, a seven-day course of vaginal miconazole or a six-day course of vaginal clotrimazole are safe and more effective than shorter courses of vaginal antifungals.<sup>9</sup> Fluconazole is not recommended in pregnancy.

Asymptomatic patients with vaginal candidiasis do not require treatment.<sup>6</sup> Vaginal candidiasis is normally not sexually transmitted, but can infect the penis of a sexual partner.<sup>3</sup> Uncircumcised male partners may develop a yeast infection under the foreskin, requiring treatment.<sup>3</sup>

### Trichomoniasis

Vaginal trichomoniasis, caused by *Trichomonas vaginalis*, is responsible for approximately 15-20% of vaginal infections.<sup>3</sup> It is the third most common cause of infectious vaginitis.<sup>7</sup>

Trichomoniasis is primarily transmitted

through sexual activity and is viewed as a sexually transmitted infection.<sup>3</sup> Its incidence is highest among women with multiple sex partners and it is associated with the use of non-barrier contraceptive methods.<sup>3</sup> Most men with trichomoniasis are asymptomatic and are thought to be reservoirs for the disease.<sup>3</sup> Any women identified with trichomoniasis should be encouraged to inform and recommend treatment to any sexual partner.<sup>3</sup>

Although *Trichomonas* can survive on objects, such as towels and bathing suits, non-sexual transmission is very rare.<sup>3</sup>

Like bacterial vaginosis and vaginal candidiasis, many patients with this infection will be completely asymptomatic.<sup>6</sup> Approximately one-third of asymptomatic women with trichomoniasis will develop symptoms within six months.<sup>3</sup> Trichomoniasis causes a foul-smelling, yellow or green vaginal discharge that is often profuse and frothy.<sup>6</sup> External and internal vaginal irritation, itch and painful urination are common in women with symptoms.<sup>3</sup>

The only recommended treatment for trichomoniasis is prescription oral metronidazole.<sup>4</sup> The standard treatment is a single 2 g oral dose.<sup>4</sup> An alternative dosage regimen is oral metronidazole 500 mg BID for seven days.<sup>4</sup> *Trichomonas* can grow in other areas beside the vagina (e.g. the external vagina). Topical metronidazole therapy is much less effective than oral therapy.<sup>4</sup> Oral metronidazole regimens have an efficacy of 82–88% for both regimens and this increases to 95% if the partner is also treated.<sup>13</sup>

### Other OTC Products

When a woman is trying to self-select a medication for a vaginal problem, she is confronted with a variety of products. Although some of these products may help with symptoms, many of them are of questionable benefit and others have the potential to make the condition worse.

### Vaginal Anti-Itch Creams

These products are commonly located next to vaginal yeast infection products on the shelves of most pharmacies. These products normally contain local anesthetics and external pain relievers that help relieve itching.<sup>14</sup> These creams only relieve minor itching and have no

effect on killing the bacteria/fungus that is causing the symptoms.<sup>14</sup> This will effectively mask the symptoms but will not resolve the condition.<sup>14</sup> When purchasing these creams, women should be informed that they may experience only temporary relief of symptoms and use of these creams may delay appropriate treatment with effective medications.<sup>14</sup>

### Natural Health Products

A large number of natural health products are marketed to combat yeast infections.<sup>14</sup> Of the products available for yeast infections, homeopathic remedies predominate.<sup>14</sup> Homeopathic medications are often so diluted that they do not contain even a single molecule of the “active” ingredient.<sup>14</sup> Studies have demonstrated that women with recurrent vaginal infections select products based on price and homeopathic products tend to be cheaper than proven candidiasis medications.<sup>14</sup> An estimated 42% of women with recurrent vaginal yeast infections have resorted to alternative therapies.<sup>14</sup> These products have not been proven efficacious and may delay appropriate treatment of more serious conditions.<sup>14</sup>

### Probiotics

Probiotics are live microorganisms that may provide some health benefits to the patient.<sup>15</sup> Studies of probiotics in women with infectious vaginitis are very limited. For bacterial vaginosis, the combination of metronidazole and a probiotic seems a promising treatment option, but there is insufficient evidence for or against the use of probiotics.<sup>16</sup> The use of probiotics in patients with vaginal candidiasis is controversial. One review concluded that probiotics may be considered as preventive agents in women who suffer more than three episodes of vaginal candidiasis per year, since they have some evidence of efficacy and few adverse effects.<sup>15</sup>

### Vaginal Douches

A vaginal douche is a solution used to irrigate the vagina. As was discussed earlier, the vagina has a delicate balance of good bacteria and vaginal douches can interrupt this system. Vaginal douching has been directly linked to bacterial

vaginosis<sup>17</sup> and pelvic inflammatory disease.<sup>6</sup> Women should be strongly discouraged from using vaginal douches.

### Personal Hygiene Products

Women should be advised to avoid using local irritants, such as perfumed soaps and shower gels, and to be wary of feminine hygiene products, such as wipes, powders and sprays, as they can upset the body's healthy bacteria or cause allergic reactions.<sup>6</sup>

### The Role of the Technician

Most products for vaginal candidiasis are available in Canada without a prescription. Of the patients purchasing these products, only one-third are likely to have a yeast infection.<sup>1</sup> Also many of the OTC products, such as douches and vaginal itch creams, have limited benefits and can delay treatment with appropriate products.

Technicians can play a crucial role in helping to identify patients who may require assistance in selecting an appropriate OTC product. By approaching the patient and asking if they need any help selecting or finding a product can relax the patient and make them more susceptible to learning about the different OTC medications and make the patient feel very comfortable discussing these common conditions. Technicians can also screen patients who have misconceptions about vaginal health and vaginal infections and their treatment. Asking simple questions can provide clues as to which patients need to be referred to the pharmacist. Some questions to consider include:

- Have you ever used these products before?
- Have you ever seen a physician for this problem?

Technicians can monitor for repeat customers who seem to be purchasing these products frequently and refer them to the pharmacist. Technicians can obtain appropriate information pamphlets on the infections and treatments and make them readily available.

Vaginal products are being used for personal purposes and many women will ask to pay for them at the dispensary counter. This offers an opportunity for technicians to intervene on the possible inappropriate use of these products and to

recommend counselling and education by the pharmacist. Through regular intervention and counselling, these women can be given the most effective product for their current condition or the pharmacist can refer them to a physician for further evaluation.

### Key Learning Points

1. The majority of patients selecting OTC vaginal yeast infection products do not have a yeast infection
2. Bacteria vaginosis is the most common type of infectious vaginitis
  - Half of the patients with bacteria vaginosis are asymptomatic. These women do not require treatment unless they are pregnant and have a history of preterm delivery
  - The most common symptom of bacteria vaginosis is a foul-smelling, white/grey homogeneous discharge that adheres to the vaginal walls
  - The treatment of choice for bacteria vaginosis is prescription metronidazole 500 mg orally BID for 7 days
3. Vaginal candidiasis is the second most common cause of infectious vaginitis
  - Approximately 20% of women will have the yeast that causes the infection as part of their normal vaginal flora
  - Risk factors for developing vaginal candidiasis include recent antibiotic

use, pregnancy, poorly controlled diabetes, excessive heat and moisture from wearing synthetic undergarments, and HIV infection

- OTC vaginal or oral antifungal products are effective for most women
  - Women with recurrent infections or who have uncontrolled diabetes or are HIV positive may require a longer duration of therapy.
4. Trichomoniasis is the third most common cause of infectious vaginitis
    - It is a sexually transmitted infection
    - Causes foul-smelling, yellow or green vaginal discharge that is often profuse and frothy
    - The standard treatment is a single 2 g oral dose of prescription metronidazole
    - All sexual partners should be informed and treated
  5. Using vaginal anti-itch creams or natural health products for the treatment of infectious vaginitis are of little value and can delay effective treatment
  6. Personal hygiene products and vaginal douches do not help and may actually increase the risk of infectious vaginitis

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## QUESTIONS

Mrs. Chen asks you if you can ring in her purchase of miconazole 2% vaginal cream. She says that she is a bit embarrassed and does not want to ring it in the front cash. She has never used these types of products before but has heard that this is a really common infection and the treatments are very effective for yeast infections. She wants to know how she even caught this infection.

1. Which of following is the MOST common cause of vaginitis?

- a) Bacterial vaginosis
- b) Vaginal candidiasis
- c) Trichomoniasis
- d) Allergic vaginitis

2. Which of the following is a healthy bacterium that protects the vagina from infection?

- a) Candida
- b) Trichomonas

- c) Lactobacillus
- d) Gardnerella

3. What is/are the main role(s) of the protective bacteria in the vagina?

- a) Maintain an acidic environment
- b) Produce hydrogen peroxide
- c) Make antibodies to help fight off infection
- d) All of the above
- e) (a) and (b)

4. Approximately what percentage of women buying vaginal yeast infection products have no vaginal infection?

- a) 0%
- b) 8%
- c) 14%
- d) 25%

You decide to call over the pharmacist and she starts to discuss bacterial vaginosis with Mrs. Chen.

5. Bacterial vaginosis accounts for approximately what percentage of

infectious vaginitis in women of childbearing age?

- a) 5%
- b) 20%
- c) 50%
- d) 75%

6. Approximately what percentage of women with bacterial vaginosis are asymptomatic?

- a) 5%
- b) 10%
- c) 30%
- d) 50%

7. Which of the following is NOT common with bacterial vaginosis?

- a) Milky white discharge
- b) Homogeneous discharge
- c) Vaginal itch
- d) Fishy smelling discharge that is worse during menses or after intercourse

8. If a patient has bacterial vaginosis, which of the following statements is TRUE?

- a) It is a sexually transmitted infection
- b) All patients with bacterial vaginosis

## QUESTIONS (Continued)

- require treatment
- c) Partners should be treated to reduce the risk of reinfection
- d) Asymptomatic pregnant women should be treated if they have a history of preterm delivery

9. Which of the following is a recommended treatment regimen for bacterial vaginosis?

- a) Metronidazole 250 mg po TID for 10 days
- b) Metronidazole 500 mg po BID for 7 days
- c) Clotrimazole 100 mg vaginally daily for 6 days
- d) Metronidazole gel 10% vaginally once daily for 14 days

The pharmacist then discusses vaginal yeast infections with Mrs. Chen.

10. Which of the following is a risk factor for vaginal candidiasis?

- a) Current or recent antibiotic use
- b) Pregnancy
- c) Synthetic underwear
- d) All of the above

Please select the best answer for each question or answer online at [www.CanadianHealthcareNetwork.ca](http://www.CanadianHealthcareNetwork.ca) for instant results.

11. Which of the following is the MOST common symptom of vaginal candidiasis?

- a) Foul-smelling green discharge
- b) Vaginal itching
- c) Vulvar swelling
- d) Burning upon urination

12. Which of the following is/are the MOST appropriate treatment(s) for a pregnant woman with vaginal candidiasis?

- a) Clotrimazole 1% vaginal cream for 6 days
- b) Fluconazole 150 mg once daily
- c) Miconazole 400 mg vaginal ovule daily for 3 days
- d) All of the above
- e) (a) and (c)

13. Which of the following statements regarding vaginal candidiasis is TRUE?

- a) Asymptomatic patients should be treated to reduce the risk of transmission
- b) It is a common sexually transmitted infection

- c) Women with recurrent infections should receive a three-day course of OTC products
- d) Uncircumcised male partners may develop a yeast infection under the foreskin and require treatment

14. Which of the following statements regarding fluconazole is TRUE?

- a) It is more effective than most OTC antifungal creams
- b) It may cause gastrointestinal upset, headache and rash
- c) It leads to cure rates of greater than 90%
- d) It is the most effective treatment for recurrent infections

Mrs. Chen asked the pharmacist if there are any products that could reduce her risk of future infection.

15. Which of the following products can reduce a risk of infectious vaginitis?

- a) Homeopathy antifungal products
- b) Feminine hygiene spray
- c) Vaginal douches
- d) None of the above

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Please help ensure this program continues to be useful to you by answering these questions.

- Do you now feel more informed about vaginal infections?  Yes  No
- Was the information in this lesson relevant to you as a technician?  Yes  No
- Will you be able to incorporate the information from this lesson into your job as a technician?  Yes  No  N/A
- Was the information in this lesson...  Too basic  Appropriate  Too difficult
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