

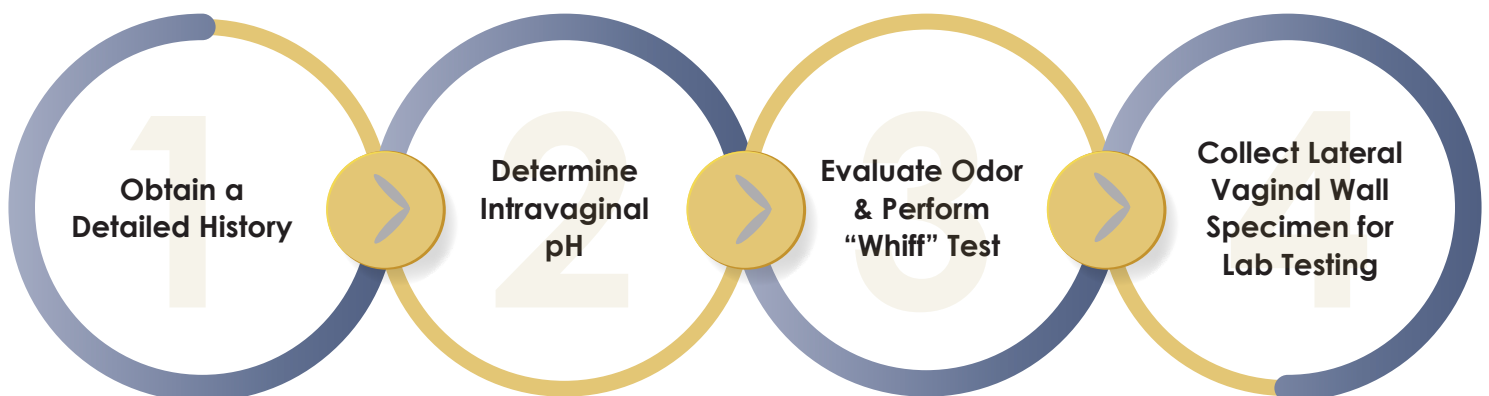


# Client Newsletter

## *The importance of determining the vaginal microbiome*

By: Sebastian Faro, MD, Ph.D.

No two vaginal microbiomes are alike, which makes diagnosing and treating vaginal dysbiosis a challenge. Our latest lab techniques help identify the various bacteria present so you can determine the appropriate treatment for a patient with vaginal dysbiosis. The most common type of vaginal dysbiosis is bacterial vaginosis. In addition, an imbalanced vaginal microbiome is associated with several urogenital and reproductive diseases. Disruption of the vaginal microbiome raises the risk for genital and reproductive tract infections, which can lead to metastatic infection of organs distant from the pelvis such as kidneys, lungs, liver, brain, and heart via bacteremia. This is why prompt, accurate diagnosis is so important. Too often, patients with vaginitis or vaginosis are considered to have an insignificant or simple condition. They deserve a thorough, stepwise evaluation as shown in Figure 1.



**Figure 1.** Steps in determining vaginal dysbiosis.



# Initial Evaluation: Evaluating a Patient with an Abnormal Vaginal Discharge

## Step 1: Obtain a Detailed Patient History

A carefully documented patient history is essential in establishing a diagnosis. Ask pertinent questions of a patient with abnormal vaginal discharge to gather details of their symptoms.

### Ask patients to describe the current symptoms as they developed:

- *"When did you experience the first episode of abnormal vaginal discharge?"*
- *"Does the discharge have an abnormal odor?"*
- *"Has the color of the discharge remained constant?"*
- *"What color is the discharge currently?"*
- *"Did you experience similar symptoms in the past?"*

### Determine what factors may contribute to the abnormality:

- *"Are you sexually active?"*
- *"Are you in a monogamous relationship?"*
  - *If in a monogamous relationship, "Did you experience abnormal vaginal discharge before having a monogamous relationship?"*
  - *If the abnormal discharge predated the monogamous relationship, "How many sexual partners did you have?"*
  - *If not currently in a monogamous relationship, "How many sexual partners do you have?"*
- *"Do you participate in oral sex?"*
- *"Do you participate in anal sex?"*
- *"Do you use sex toys?"*
- *"Does your partner wear a condom when having penetrative sex?"*
- *"Do symptoms/characteristics of the discharge change in quality or quantity following sexual activity?"*
- *"Do you use any intravaginal products such as douche, lubricant, suppositories or tampons?"*
- *"Do you use personal hygiene products on your private parts including feminine washes, wipes, powders or sprays?"*
- *"Do you urinate after sexual intercourse?"*
- *"Do you only wipe from front to back when using the toilet?"*

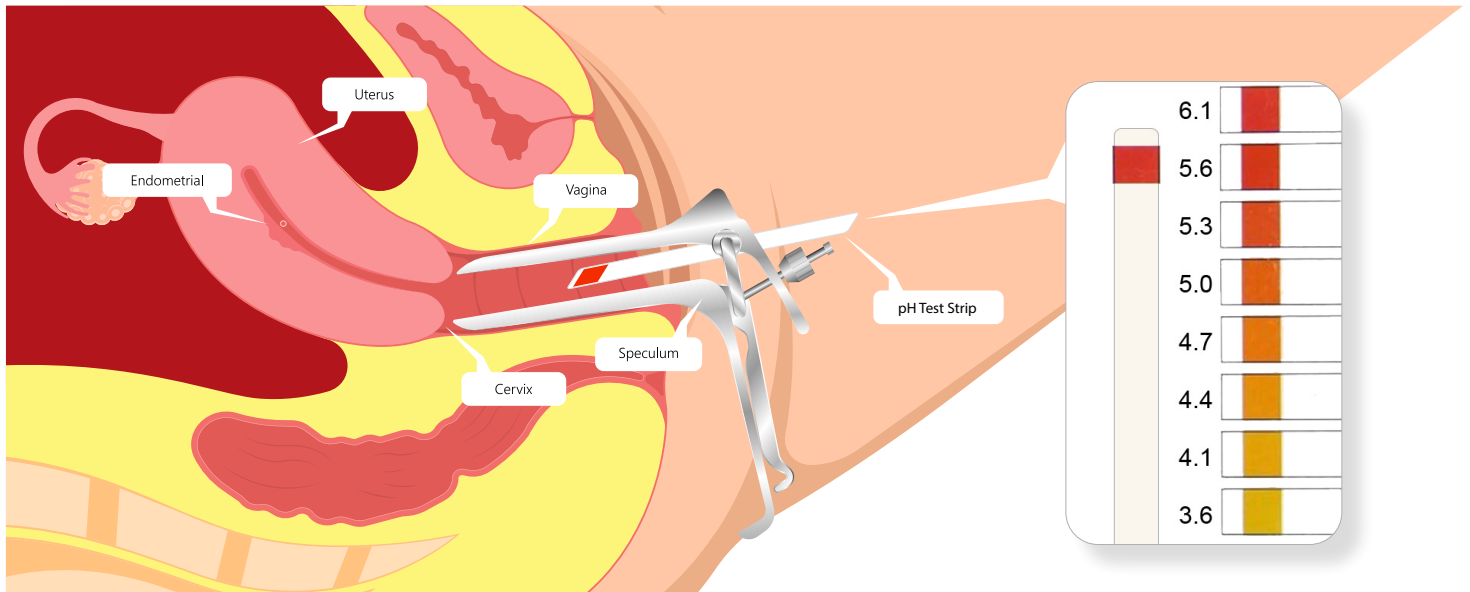
### Find out about previous treatment attempts:

- *"What treatments have you tried?"* Possible answers include oral metronidazole, vaginal metronidazole, vaginal clindamycin, over-the-counter agents, and home remedies.
- *"Did the condition resolve?"*



## Secondary Evaluation:

Although obtaining an accurate history is important it cannot provide a definitive diagnosis. Acting on history alone can lead to inappropriate treatment. Due to considerable overlap in symptoms among different causes of abnormal discharge, a physical examination and diagnostic testing is necessary.



### Step 2. Measure the Intravaginal pH

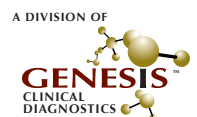
Assessment of intravaginal pH is a helpful but frequently neglected procedure used to evaluate vaginal health. Upon visualizing the cervix, place a test strip against the vaginal wall in the middle third of the vagina to moisten the strip thoroughly.

pH ≤ 3.6	pH ≥ 3.6 to ≤ 4.5	pH > 4.5 – <5	pH > 5
<b>A Hyperacidic Condition which may indicate:</b> <ul style="list-style-type: none"> <li>Cytolytic Vaginosis:               <ul style="list-style-type: none"> <li>Over – growth of <i>Lactobacillus</i></li> <li>Resulting in lysis of vaginal epithelial cells</li> </ul> </li> <li>Desquamative Vaginitis</li> </ul>	<b>Normal pH:</b> <ul style="list-style-type: none"> <li>Do not assume that this is due to dominance by <i>Lactobacillus crispatus</i>, <i>L. gasseri</i>, or <i>L. jensenii</i>.</li> </ul>	<b>Transformation Stage or Unstable Microbiome:</b> <ul style="list-style-type: none"> <li><i>Gardnerella vaginalis</i> indicates a likely progression to bacterial vaginosis (BV)</li> <li>No <i>Gardnerella vaginalis</i>? The microbiome is more likely to progress to aerobic vaginitis (AV)</li> </ul>	<b>An Abnormal Vaginal</b> <ul style="list-style-type: none"> <li><b>Microbiome</b> has likely been established.</li> </ul>



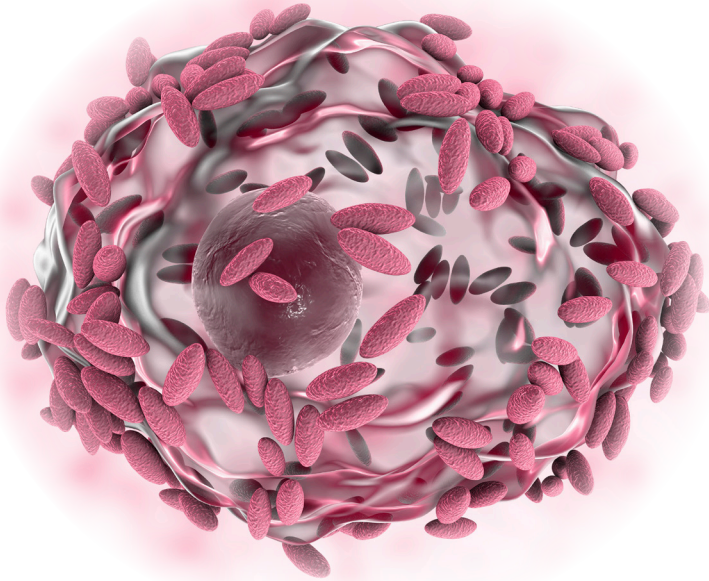
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### Step 3. Evaluate for Vaginal Odor

A clinician can observe unaltered vaginal discharge and evaluate for odor. Mix one or two drops of vaginal discharge with one or two drops of potassium hydroxide (KOH) to perform a “whiff” test in the office. A fishy or fetid odor will be immediately detectable if obligate anaerobic bacteria dominate the vaginal discharge.



### Causes of Vaginal Odor

- Bacterial vaginosis
- Poor hygiene
- Retained tampon
- Trichomonas vaginitis
- Rectovaginal fistula
- Cervical cancer
- Vaginal cancer
- Cervical necrosis secondary to infection:
  - Syphilis
  - Herpes simplex virus (HSV)

### Step 4. Collect Lateral Vaginal Wall Specimen

The initial evaluation will establish the baseline microbiology, determine if gram – positive or gram – negative bacteria are dominant, and guide an appropriate course of treatment.

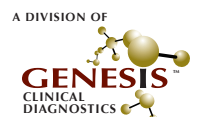
### Diagnostic Testing During the Initial Evaluation should include these four (4) assays:

1. Bacterial vaginosis (BV) Panel with Lactobacillus Profiling (MDL Test #: 166)
2. Aerobic vaginitis (AV) Panel (MDL Test #: 182)
3. Trichomonas vaginalis (MDL Test #: 111)
4. Mycoplasma/Ureaplasma Panel (MDL Test #: 134)



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# Third Evaluation: Lab Results

An accurate diagnosis requires more than simply determining the presence of organisms — we need to identify alterations and shifts in the vaginal microbiome, too. When assessing disease risk, diagnosis, and treatment, account for differences between the vaginal microbiomes of individual patients. The goal of clinical management for patients with abnormal vaginal discharge is complete recovery and a balanced vaginal microbiome.

## Consider the composition of the vaginal microbiome...

### What species of Lactobacillus are present?


If one of three (3) species of *Lactobacillus* is present (*L. crispatus*, *L. gasseri*, and *L. jensenii*) what is the percentage? The threshold or concentration of *Lactobacillus* can help determine the stability of the vaginal microbiome. In my experience, I believe a concentration of **<85% implies instability and requires treatment.**

### Is the vaginal microbiome in transition?

- Is *Lactobacillus iners* present? The presence of this species indicates that the vaginal microbiome is unstable and can easily undergo transition.
- Is *Gardnerella vaginalis* present? If *Gardnerella vaginalis* is present, the vaginal microbiome will likely progress to Bacterial Vaginosis (BV). If *Gardnerella vaginalis* is not present, the vaginal microbiome will likely progress to Aerobic Vaginitis (AV). If present in a suboptimal concentration, the vaginal microbiome can develop into a mixed microbiome (BV/AV).

### Is *Trichomonas vaginalis* present?

- When vaginal dysbiosis is present, there is a strong possibility that *Trichomonas vaginalis* is a factor. It's best to do a microscopic examination of the vaginal discharge.
- Individuals found to have *Trichomonas vaginalis* or *Mycoplasma genitalium* should be screened for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.



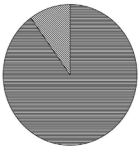
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**MDL#: 8875032      Final Test Results**

Patient Information: SSN: N/A      DOB: 1/1/1978 (Age:43) DOE, JANE 123 MAIN ROAD MARLTON, NJ 08053	Ordering Physician/Lab: DOE WOMANS GROUP JOHN DOE, MD 555 SMITH STREET ANYTOWN, NJ 55555	NPI: 1234567890
Sex: Female Home: (856) 556-5555	Tel: (856) 556-5562 Fax: (856) 556-5553	

Date Received: 7/6/2023      Date Reported: 7/8/2023

Test	Specimen	Date Collected	Comment	Normal	Result	Abnormal	Reference/Units/Comments
Gardnerella vaginalis by Real-Time PCR	-	7/5/2023	-	Negative			
132 Verified 7/7/2023	Swab - 1		Vaginal				
Atopobium vaginae by Real-Time PCR	-	7/5/2023	-			Positive	
142 Verified 7/7/2023	Swab - 1		Vaginal				
Bacterial Vaginosis Associated Bacteria 2 (BVAB2) by Real-Time PCR	-	7/5/2023	-	Negative			
164 Verified 7/7/2023	Swab - 1		Vaginal				
Megasphaera species (Type 1 and Type 2) by Real-Time PCR	-	7/5/2023	-	Negative			
165 Verified 7/7/2023	Swab - 1		Vaginal				
Lactobacillus (BV & AV Panel) by Real Time PCR	-	7/5/2023	-				L. crispatus: Negative; L. gasseri: Negative; L. jensenii: Negative; Liners: Positive.
179 Verified 7/7/2023	Swab - 1		Vaginal				



Atopobium vaginae (90%)  
Lactobacillus iners (10%)

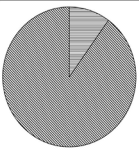
Indicative of Abnormal microflora.  
Suggestive of Bacterial Vaginosis.

Page 1 of 1      View: M      Mail: Yes/None      USPS: Yes      Fax: Yes/None      Manual: No      Medical Director: Jing-Yang, M.D.

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Date Reported: 7/8/2023

Test	Specimen	Date Collected	Comment	Normal	Result	Abnormal	Reference/Units/Comments
Bacterial Vaginosis Associated Bacteria 2 (BVAB2) by Real-Time PCR	-	7/5/2023	-	Negative		Positive	
164 Verified 7/7/2023	Swab - 1		Vaginal				
Megasphaera species (Type 1 and Type 2) by Real-Time PCR	-	7/5/2023	-	Negative			
165 Verified 7/7/2023	Swab - 1		Vaginal				
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Atopobium vaginae (10%)  
Lactobacillus iners (90%)

Indicative of Abnormal microflora.  
Suggestive of Bacterial Vaginosis.

Page 1 of 1      View: M      Mail: Yes/None      USPS: Yes      Fax: Yes/None      Manual: No      Medical Director: Jing-Yang, M.D.      MDL#: 8875032      28021      7/8/2023      PATH      Final



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## Interpreting the Lab Report: Key Points to Keep in Mind

- **A concentration of <85% of *Lactobacillus crispatus*** or *L. gasseri* or *L. jensenii* is, in my experience, indicative of an unstable vaginal microbiome.
- **The presence of *Lactobacillus iners***, regardless of the concentration, indicates an unstable vaginal microbiome.
- **Gardnerella and Atopobium exhibit variable sensitivity** to metronidazole and clindamycin. Currently, commercial laboratories do not offer antibiotic sensitivity testing for Gardnerella and Atopobium. When a patient is treated with metronidazole and symptoms do not abate, subsequently treat them with clindamycin and vice versa.
- **Does the lab report a mixed vaginal microbiome** (i.e., AV and BV)? In my experience, this makes the patient more vulnerable to developing an upper genital tract infection.
- **AV and BV should be initially treated with probiotics.** I initiate probiotics at the first visit. If the numbers of bacteria are over-whelming I start with antibiotics, depending on the which bacterium appears to be dominant. Ultimate FloraMax Vaginal Balance 50 Billion can be compounded by a pharmacist into a suppository from each capsule. The patient uses 1 vaginal suppository on Monday, Wednesday, and Friday for 7 weeks. In my experience, this every-other-day schedule allows the suppository to dissolve completely. In addition, I recommend 1 capsule be taken orally once daily for 6 months.
- **Check the pH after 3–4 weeks** to determine vaginal therapy effectiveness. If the pH has decreased to  $\leq 4.5$ , progress is being made. If the pH has not decreased, continue therapy and add metronidazole 500 mg orally, twice daily for 7 days. Recheck the vaginal pH after therapy is complete. If the pH  $\leq 4.5$ , progress is being made. Make sure the patient is taking their daily oral probiotic.
- **If the pH plateaus between  $> 4.5$  and  $< 5$ ,** continue vaginal probiotic therapy.
- **The goal is to achieve a vaginal pH  $< 4.5$**  and a Lactobacillus dominant microbiome.
- If the patient's vaginal microbiome is dominated by:
  - **Gram-positive facultative bacteria:** Treat with mupirocin 10% vaginal suppositories daily for 14 days and follow with the vaginal probiotic regimen. Administer oral probiotic, 1 capsule daily for 6 months.
  - **Gram-negative facultative bacteria:** Treat with ceftriaxone 125–250 mg vaginal suppository daily for 14 days and follow with the vaginal probiotic regimen. Administer oral probiotic, 1 capsule daily for 6 months.
- **Re-evaluate the patient's vaginal microbiome** every three months for one year to ensure stability.
- **During the treatment of vaginal dysbiosis,** the patient's partner should wear a condom until the patient's vaginal microbiome has been re-established as a Lactobacillus dominant flora.

**The next edition of this newsletter will address the patient with recurrent vaginal dysbiosis.**



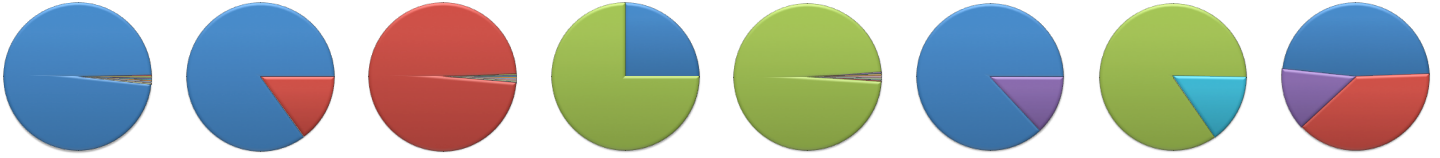
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# Vaginal microflora drift from normal to BV

Normal vaginal microflora. No bacterial vaginosis.



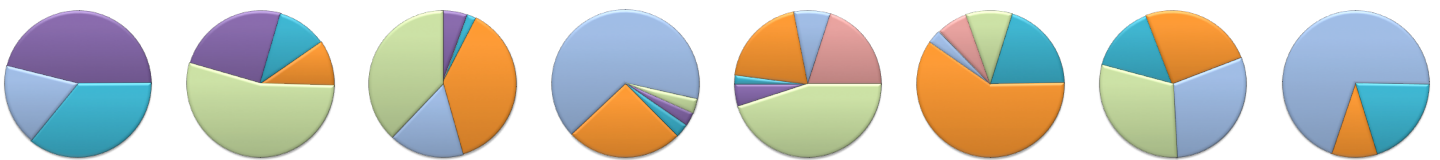
Microflora drift

Transitional vaginal microflora. Increased risk of bacterial vaginosis.



Microflora drift

Abnormal vaginal microflora. Bacterial vaginosis.



Microflora drift

■ *L. crispatus*

■ *L. iners*

■ *Megasphaera* Type 1

■ *L. jensenii*

■ *G. vaginalis*

■ *Megasphaera* Type 2

■ *L. gasseri*

■ *A. vaginae*

■ BVAB2



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## About the Author

Dr. Sebastian Faro is one of the world's leading OB/GYNs. A board-certified obstetrician and gynecologist who has practiced general obstetrics and gynecology for over 40 years, Dr. Faro has welcomed tens of thousands of healthy babies into the world while continuing to mentor fellow doctors. Dr. Faro received his Ph.D. from the University of Iowa and his medical degree from Creighton University School of Medicine in Omaha, Nebraska. He has written and edited several medical textbooks pertaining to diseases in obstetrics and gynecology. He is a member of the American Gynecological and Obstetrical Society and a Fellow of the Infectious Disease Society of America. Dr. Faro is currently Clinical Professor of Ob/Gyn, Department of Ob/Gyn, School of Medicine, at the University of Houston in Houston, Texas.



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