



# Client Newsletter

## Is there a need for assessing the vaginal microbiome in pregnant women?

By: Sebastian Faro, MD, Ph.D.

Pregnancy can be a precarious condition fraught with risks for various diseases of both infectious and non-infectious origin. Significant pregnancy complications can occur and may include premature labor with subsequent delivery of a premature infant, preterm premature rupture of membranes (PPROM), and chorioamnionitis.

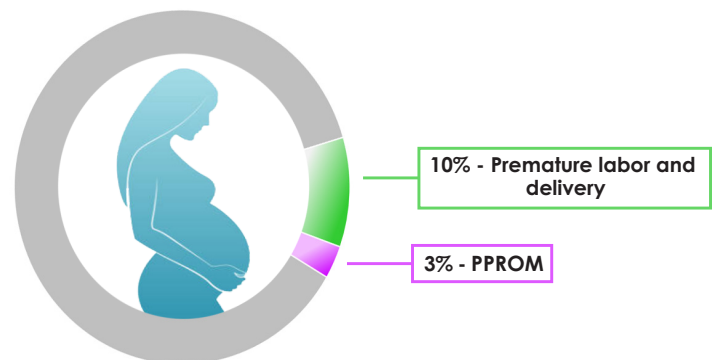
### What do these statistics mean for the obstetrician?

For every 100 deliveries an obstetrician performs, they'll encounter ten women experiencing preterm labor and delivery and three women experiencing PPRM. There are many causes of premature labor— infection, multiple fetuses, chronic conditions including diabetes, high blood pressure, and renal disease. The consequences of preterm labor and delivery on the fetus vary, depending on fetal gestational age. For the mother, the consequences of preterm labor and delivery usually hinge on duration of labor, the presence of ruptured membranes, and the route of delivery.

(Women who deliver by cesarean section are generally at greater risk of developing a postoperative infection.)

The most common cause of infection resulting in premature labor, PPRM, and chorioamnionitis is the pregnant patient's own indigenous vaginal bacteria. Pregnant patients with vaginal microbiomes dominated by one or more of the following—*Lactobacillus crispatus*, *L. gasseri*, and *L. jensenii*— are at extremely low risk of developing an infection and premature labor or PPRM.

However, pregnant patients with vaginal dysbioses, such as aerobic vaginitis, bacterial vaginosis, or mixed vaginitis/vaginosis, are at higher risk. Also consider that patients with trichomoniasis have an altered vaginal microbiome or vaginal dysbiosis, which may contribute to PPRM.



**Figure 1.** Occurrence of premature labor and delivery and PPRM in the United States.

### 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.



# Can the risk of PPROM, premature labor, and chorioamnionitis due to bacterial infection be reduced?

Restoring the vaginal microbiome to a *Lactobacillus crispatus*, *L. gasseri*, or *L. jensenii* -dominant bacterial community may help bring balance back to the pregnant patient's vaginal microbiome.

Based on my experience, I recommend the following:

## 1. Obtain a vaginal pH.

pH 4.5	pH ≤ 4.5 - 5	pH > 5
Highly probable that one or more of <i>Lactobacillus crispatus</i> , <i>L. gasseri</i> , or <i>L. jensenii</i> is dominant.	Transitional stage. The direction of microbial progression depends on which pathogens are present.	Transition is complete. The laboratory can assist in determining the status of the vaginal microbiome.

## 2. Vaginal specimens should be collected at the initial prenatal visit, usually at 10-12 weeks.

Diagnostic testing should be ordered to determine the constituents of the vaginal microbiome.

- **Lactobacillus Profiling:** If one of the three previously-mentioned *Lactobacillus* species is dominant, the vaginal microbiome is likely healthy, and the risk of infection impacting the pregnancy is low. However, if the dominant bacterium is *Lactobacillus iners*, the vaginal microbiome is unstable and likely, if left alone, to progress to a significant dysbiotic state.
- **Diagnostic Panels:** In concert with Lactobacillus Profiling, panels help determine the direction the dysbiotic progression will favor. If *Gardnerella vaginalis* is present, the microbiome will likely evolve to bacterial vaginosis (BV). If one or more facultative anaerobic bacteria is present, the microbiome will likely progress to aerobic vaginitis (AV). Taking vaginal specimens at the initial prenatal visit, usually at 10-12 weeks, provides sufficient time to restore the vaginal microbiome to a Lactobacillus-dominant flora.

## 3. Repeat vaginal microbiome testing should be performed at 16 -20 weeks.

Testing will confirm whether or not Lactobacillus-dominant flora has been maintained. This may significantly decrease the risk of PPROM, premature labor, and chorioamnionitis.

## 4. Additional repeat vaginal microbiome testing should be performed between 35 – 37 weeks.

Screening should be performed for Group B Streptococcus (GBS), also known as Group B Beta-hemolytic Streptococcus, and other primary pathogens, both facultative and obligate anaerobes.

### Diagnostic Testing During the Initial Evaluation Should Include These Four 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)

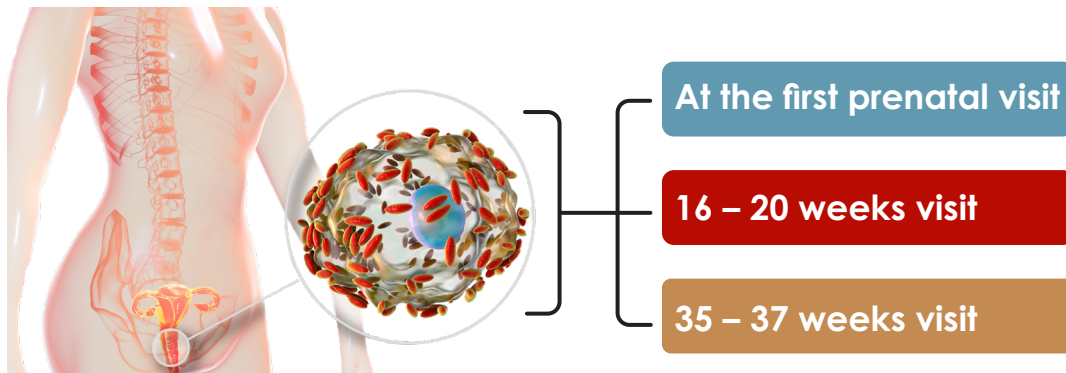


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## Critical Screening Times During Pregnancy



## How should vaginal dysbiosis in pregnant women be treated?

There are no good treatments for vaginal dysbiosis because AV, BV, or a mixed bacterial community consisting of facultative and obligate anaerobes is not equivalent to a traditional infection composed of a single organism. Since vaginal dysbiosis is a disturbance in the ecology of the vagina manifested by an overgrowth of pathogenic bacteria, it's important to determine:

- Is an appropriate species of *Lactobacillus* present?
- What is the concentration of the *Lactobacillus* species present?
- Is *Lactobacillus* absent?
- Is *L. iners* present?
- Which pathogens are present?

When the appropriate species of *Lactobacillus* are present, it is constantly being challenged by the presence of other species of bacteria. Although there is no known threshold concentration for *Lactobacillus*, I've found that when the number of lactobacilli is insufficient, the microbiome is vulnerable to transition. The administration of oral antibiotics affects the vaginal microbiome and all microbiomes of the human body. The presence of vaginal dysbiosis may also indicate an alteration of the colonic microbiome, and an altered colonic microbiome that feeds the vaginal microbiome will contribute pathogens to the vaginal microbiome.

When diagnostic tests show a microbiome consisting of predominately facultative anaerobes, I begin this treatment (personal treatment recommendation; no published data):

- **Predominantly gram-positive cocci** – Mupirocin vaginal suppositories 10% daily for 10 days.
- **Predominantly gram-negative rods** – Ceftriaxone vaginal suppositories daily for 10 days (without sensitivities for specific bacterial isolates). A compounding pharmacist will need to make mupirocin and ceftriaxone vaginal suppositories.

In my experience, a concentration of <85% of the appropriate *Lactobacillus* species implies instability and requires treatment. I begin probiotic therapy with Naturals Ultimate FloraMax Vaginal Balance. I chose this particular probiotic because it contains eight species of *Lactobacillus* and two species of *Bifidobacterium*, which facilitates colonization of *Lactobacillus*. When evaluating a pregnant patient, keep in mind:

- Antibiotic treatment alone will not yield success if the patient with AV does not have sufficient concentration of one or more of the appropriate species of *Lactobacillus*.
- A patient found with Group B *Streptococcus* (GBS) in the vaginal microbiome should receive penicillin for prophylaxis during labor, because GBS of the colon will not be eliminated with vaginal antibiotics and probiotics. I have successfully treated both pregnant and non-pregnant women with this regimen.



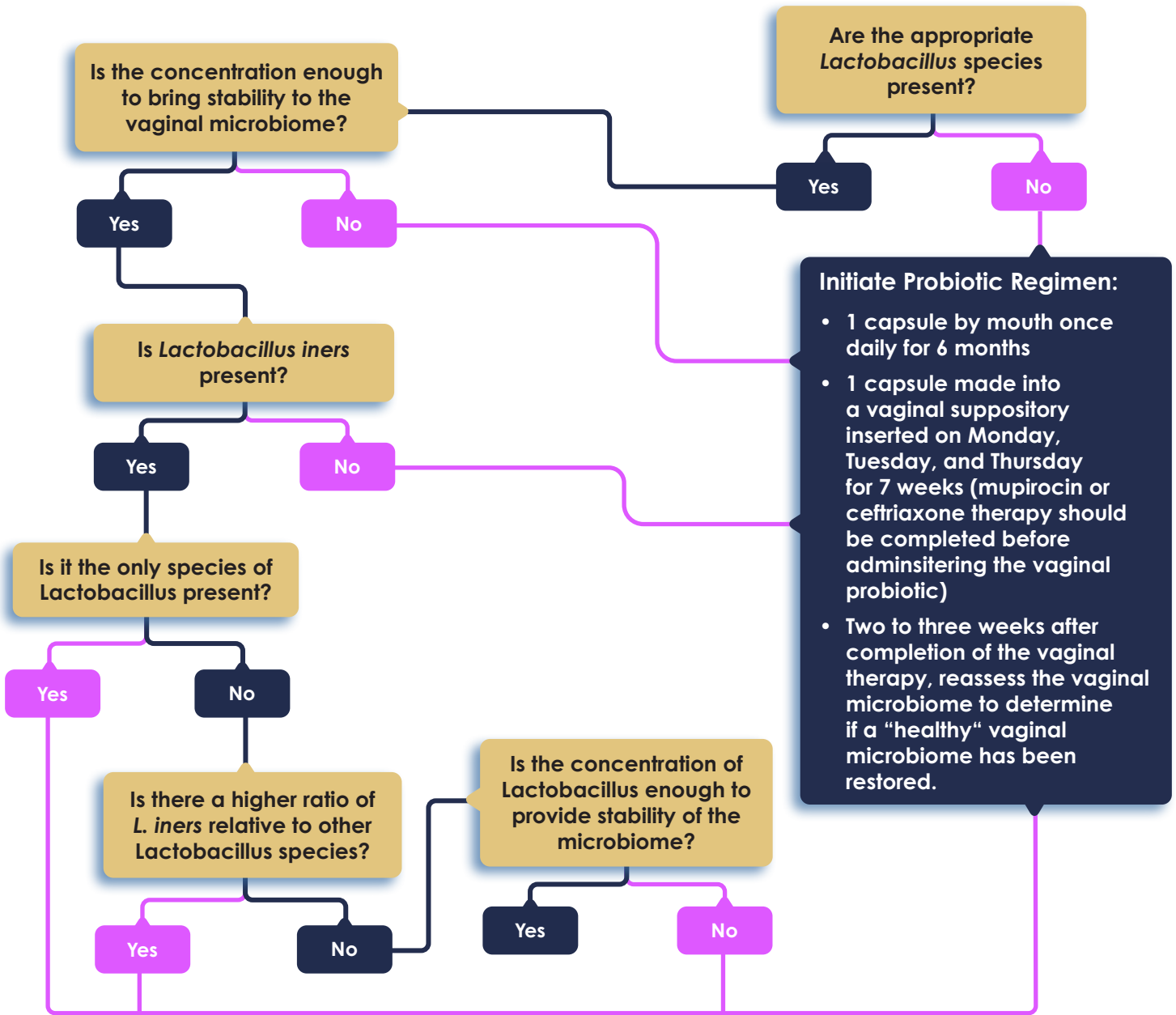
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