Marshfield Labs™

Laboratory News

VOL. 41, NO. 8 - NOVEMBER 26, 2018

NEW MOLECULAR VAGINITIS PANEL OFFERS IMPROVED SENSITIVITY, SIMPLIFIED SAMPLE COLLECTION AND CANDIDA SPECIATION

Timothy S. Uphoff, PhD, DABMG, Molecular Pathology Laboratory

On November 28, 2018, Marshfield Labs will introduce a new polymerase chain reaction (PCR) amplified vaginitis panel (test code=**VAGNAT**) to replace the existing DNA probe based vaginitis panel (test code=BVDNA). The new BDMAX vaginitis panel offers significantly improved performance (sensitivity and specificity), identification of *Candida krusei* and *glabrata* spp. as well as easier sample collection including a self-collection option.

BACKGROUND

Vaginitis is an inflammation of the vagina that can result in discharge, itching and pain. The cause is usually a change in the normal balance of vaginal bacteria or an infection. Vaginitis is one of the 25 most common medical reasons for consulting a physician in the United States, resulting in 5 to 10 million office visits per year[1]. Approximately 30% of women in the country test positive for bacterial vaginosis (BV) at any given time, and an estimated 75% of women will have at least one episode of infectious vaginitis in their lifetimes[1]. The three most common infectious causes of vaginitis are bacterial vaginosis, yeast vaginitis (candidiasis) and *Trichomonas vaginalis* vaginitis (trichomoniasis)[1].

Women with trichomoniasis or bacterial vaginosis are at a greater risk of acquiring sexually transmitted infections because of the inflammation caused by these disorders. In pregnant women, symptomatic bacterial vaginosis and trichomoniasis have been associated with premature deliveries and low birth weight babies. With the growing evidence linking vaginitis to pregnancy complications and increased risk of acquiring HIV and other sexually transmitted infections, accurate and timely diagnosis and treatment are more critical than ever.

BEYOND numbers

continued on page 2

SPECIMEN COLLECTION

As opposed to the previous BVDNA test, the new vaginitis panel does not require the use of a speculum in the vagina to permit visualization of the posterior vaginal fornix. The collection swab need only be inserted 2 inches into the vagina and rotated for 10-15 seconds and does not require internal vaginal examination. Patients can also be instructed to perform self-collected samples.

Because the assay involves PCR amplification, it is very sensitive to inhibition by vaginal lubricants and creams. If a speculum is to be used it is recommended that the vaginal sample be collected before the speculum is inserted or water be used as lubricant.

Collection kits can be viewed at Marshfield Labs Test Reference Manual, Specimen Transport Pictorial. Marshfield Clinic Health System (MCHS) departments may order the new UVE collection kits via their usual procedure using Lawson #221176. Marshfield Labs outreach clients may request the kits from Marshfield Labs. Urine is not an acceptable sample type.

ADVANTAGES OF NEW METHOD

The new vaginal panel simultaneously detects and differentiates the three most common infectious causes of vaginitis[2] — *T. vaginalis, Candida species*[3] and independent calls for *Candida krusei* and *Candida glabrata*, as well as bacterial vaginosis (BV markers[4]).

- Enhanced Bacterial Vaginitis Algorithm:

While the BVDNA assay evaluated only the presence of *Gardnerella vaginalis* in the identification of BV, the new method utilizes a superior microbiome based algorithm[2,4] to evaluate the balance of normal and abnormal vaginal flora and provide the first ever FDA authorized molecular diagnostic test for BV.

Normal and abnormal flora considered in the bacterial vaginitis algorithm:

- Normal Flora
  - *Lactobacillus* species (*L. crispatus* and *L. jensenii*)
- Abnormal Flora
  - *Gardnerella vaginalis*
  - *Atopobium vaginae*
  - Bacterial vaginosis associated bacteria–2 (BVAB-2)
  - *Megasphaera-1*

- Expanded *Candida* spp. Reporting:

The new panel identifies *C. albicans*, *C. tropicalis*, *C. parapsilosis*, and *C. dubliniensis* and reports these species as *Candida* group. In addition to the *Candida* group species, the assay also identifies and reports *C. glabrata* and *C. krusei* separately. Because these species can be resistant to common antifungals (azoles), reporting their results separately can guide patient management and improve antifungal treatment choices.

- Improved Sensitivity:

The new vaginal panel offers advantages over traditional techniques such as Amsel's criteria, direct microscopy (wet mount), culture or Gram stains/Nugent Scoring: (1) streamlined testing with the flexibility to test vaginal swabs that are either clinician-collected or patient self-collected

continued on page 3

and (2) objective, accurate results that support consistency in testing as opposed to the variability observed amongst the multiple methods required for traditional testing[1,6]. This PCR amplified panel offers >90% sensitivity in comparison with sensitivity estimates of ~50-60% for traditional direct microscopy and Amsel criteria[7]. This new assay also provides significant performance enhancement over the previous BVDNA test.

SUMMARY OF BD MAX™ VAGINAL PANEL PERFORMANCE (CLINICAL TRIAL DATA)[2]

Target	Collection Type	Sensitivity	Specificity	PPV	NPV
Bacterial Vaginitis	Clinician	90.5%	85.5%	89.0%	87.7%
	Self	90.7%	84.5%	88.1%	87.8%
***Candida* group**	Clinician	90.9%	94.1%	87.8%	95.7%
	Self	92.2%	91.9%	84.1%	96.2%
Candida glabrata	Clinician	75.9%	99.7%	81.6%	99.6%
	Self	86.7%	99.6%	81.0%	99.8%
Candida krusei	Clinician	*	*	*	*
	Self	*	*	*	*
T. vaginalis	Clinician	93.1%	99.3%	91.8%	99.4%
	Self	93.2%	99.3%	91.8%	99.4%

- No *C. krusei* infections were encountered among samples in the clinical trial. FDA submission included contrived samples containing *C. glabrata* and *C. krusei* which demonstrated 100% sensitivity and specificity.

- Superior Detection of Co-Infections:

Clinical trial data also demonstrated that this new BDMAX panel detected a mixed infection rate of 21.3% which was far superior to the direct microscopy detection rate of mixed infections of only 7.4% among the same samples [see summary in table on next page][7]. The high rate of mixed infections in patients with vaginitis demonstrates the need to simultaneously test for all targets of vaginitis to ensure appropriate treatment is initiated in a timely manner.

HOW TO ORDER THIS TEST

- Test Name: Vaginitis Panel, NAT
- Test Code: VAGNAT
- Keywords: Vaginosis, BV, Bacterial, Nucleic Acid Test, Vaginitis
- Specimen Type: UVE collection swab
- Preferred Container: UVE collection swab in sample buffer tubes
- Specimen Volume: 1 swab in sample buffer tubes
- Rejection Criteria: Inappropriate collection device
- Storage: 2-8°C
- Performing Lab: Marshfield Center
- Test Availability: Daily
- CPT Code: 87801, 87481 x2, 87661

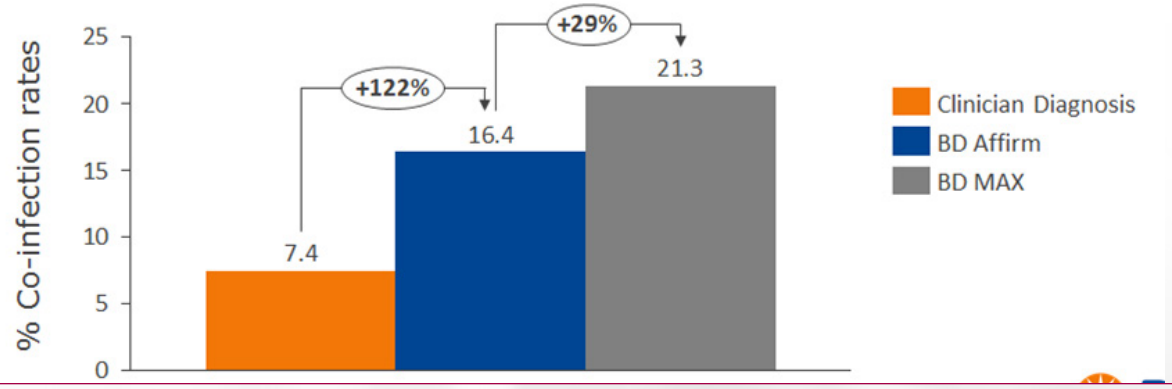
continued on page 4

- Qualitative Interpretation: Reported as Negative, Positive, or Indeterminate for Bacterial vaginosis, *Candida* species group, *Candida glabrata*, *Candida krusei* and *Trichomonas vaginalis*. Indeterminate results are inconclusive. Repeat testing with a new specimen is recommended.
- MCHS providers and staff can find results in CMR under: • Lab By Date • Lab By Panel.

Co-infection detection rates

Calculated using 1510 clinician-collected samples for which reference methods for all BV / *Candida* spp. / TV were conforming

Co-Infection	Clinician Diagnosis		BD Affirm[1]		BD MAXTM	
	no. cases	%	no. cases	%	no. cases	%
BV / *Candida* spp.	77	5.1%	181	11.9%	224	14.8%
BV / *T. Vaginalis*	27	1.8%	59	3.9%	73	4.8%
Candida spp. / *T. Vaginalis*	4	0.3%	1	0.1%	4	0.3%
BV / *Candida* spp. / *T. vaginalis*	3	0.2%	7	0.5%	21	1.4%
TOTAL	**111**	**7.4%**	**248**	**16.4%**	**322**	**21.3%**



QUESTIONS

- Test information is available in: Marshfield Labs' Test Reference Manual.
- Clinical and technical information: Timothy S. Uphoff, PhD, Molecular Pathology Laboratory.
- Phone number: 1-800-222-5835.

REFERENCES

1. Carr PL et al. "Shotgun" versus sequential testing. Cost-effectiveness of diagnostic strategies for vaginitis. JGIM. 2005;793-799.
2. Package Insert/Clinical Trial Data.
3. Including *C. albicans, C. tropicalis, C. parapsilosis, and C. dubliniensis*.
4. *Lactobacillus* spp. (*L. crispatus* and *L. jensenii*), *Gardnerella vaginalis*, *Atopobium vaginae*, Bacterial Vaginosis Associated Bacteria-2 (BVAB-2), *Megasphaera-1* (please note that these individual markers are not reported).
5. Hainer BL et al. Vaginitis: diagnosis and treatment. Am Fam Phys. 2011;83:807-815.
6. CDC Sexually Transmitted Diseases Treatment Guidelines, 2015 Morbidity and Mortality Weekly Report Recommendations and Reports / Vol. 64 / No. 3.
7. Gaydos CA et al. Clinical Validation of a Test for the Diagnosis of Vaginitis. Obstet Gynecol. 2017 July; 130(1):181–189.