**THE TISSUE SYSTEMS PATHOLOGY TEST OBJECTIVELY RISK-STRATIFIES PATIENTS WITH BARRETT’S ESOPHAGUS: A MULTICENTER U.S. CLINICAL EXPERIENCE STUDY**

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**Introduction**

- Barrett’s esophagus (BE) is a precursor to esophageal adenocarcinoma (EAC), and guidelines recommend endoscopic surveillance for early detection and treatment of dysplasia and EAC.1,2
- Endoscopic surveillance every 3-5 years is recommended for patients with non-dysplastic BE (NDBE) due to the low overall rate of progression to high-grade dysplasia (HGD)/EAC of 0.63%/year.2
- However, since 89% of the patients undergoing surveillance for BE in the US have a pathology diagnosis of NDBE, this subset harbors at least 50% of the patients who progress to HGD/EAC. These patients can be missed and therefore undertreated by the current standard of care.4
- Clinical and pathology factors have limited value in stratifying BE patients for malignant progression.5
- Early detection of high-risk BE patients is critical to enable risk-aligned patient management, including escalation of care to prevent malignant progression.6
- This study evaluated the performance of the validated, commercially available tissue systems pathology test (TissueCypher, TSP-9)14 to risk-stratify clinically relevant subsets of BE patients in a multi-center clinical cohort.

**Methods**

- TSP-9 test results (risk score and class, probability of progression to HGD/EAC within 5 years) ordered by 623 physicians at 362 clinical sites for 5,350 BE patients were abstracted from clinical reports per an IRB-approved protocol.
- Clinical and pathology data were abstracted from pathology and endoscopy reports submitted with the test orders.
- Risk stratification and probability of progression were evaluated in clinically relevant subsets of BE patients.

**Results**

- **Table 1. Patient Characteristics**

| Practice Setting, n (%) | Academic medical center | 249 (29) | Non-academic | 4,381 (33.1) |
| Age, median (IQR) years | 73 (65 – 79) | 588 (70 – 73) | 588 (70 – 73) |
| Sex, n (%) | Male | 3,313 (61.9) | Female | 2,033 (38.0) |
| Pathology Diagnoses, n (%) | NDBE | 4,981 (93.1) | IND | 363 (6.9) |
| Segment Length, n (%) | Long (>2 cm) | 528 (55.5) | Short (≤2 cm) | 183 (19.4) |
| TSP-9 Test Results, n (%) | Low risk | 4,433 (82.9) | Intermediate (int) risk | 580 (10.3) |

**Figure 1. TSP-9 risk stratification in diagnostic subsets of BE patients**

- With TSP-9 risk stratification, patients with clinically higher risk factors (male and IND/LGD) were predicted to progress at a higher rate (5.6%; IQR 3-12) than patients with clinically lower risk factors (female and NDBE, 3.0%; IQR 2-5, P<0.0001, Figures 2 and 3).
- In female patients with NDBE, TSP-9 identified 14.3% of patients as intermediate/high risk with a predicted 5-year progression rate of 8.1% (IQR, 7.9-12) and 15.2% (IQR, 13.24) (Figure 3), respectively, which was significantly higher than progression rates in male patients with IND/LGD (5.6%; IQR, 3-12; P<0.0001) (Figure 2), and similar to published estimates of progression in patients with confirmed LGD.9
- The TSP-9 test identified 56.3% of male patients with diagnoses of IND/LGD as low risk with a predicted 5-year progression rate of 2.9% (IQR 2-4) (Figure 2), which was similar to the progression rate in female patients with NDBE (3.0% (IQR 2-5)) (Figure 3), and similar to published estimate of progression in patients with NDBE.5

**Discussion**

- Clinical use of TSP-9 showed adoption that reflects the BE surveillance population in the US with 93.1% of orders coming from community practice sites and 92.7% having pathology diagnoses of NDBE.
- In patients with lower risk clinicopathologic factors (female and NDBE), TSP-9 identified intermediate/high risk patients who were predicted to progress at a higher rate than patients with LGD. Guidelines recommend escalation of care to endoscopic eradication therapy or short-interval surveillance for patients with LGD due to the associated risk of progression. The intermediate/high risk patients identified by TSP-9 may benefit from similar escalation of care to prevent EAC.
- In patients with higher risk clinicopathologic factors (male and IND/LGD), TSP-9 identified low risk patients with predicted progression rates similar to patients with NDBE. This finding indicates that there are low-risk patients with IND who may be effectively managed by long interval surveillance, and low-risk patients with LGD who may be effectively managed by short interval surveillance instead of EET.

**Conclusions**

- TSP-9 test provided impactful risk stratification within all clinically relevant patient subsets, including those considered to be at low risk for malignant progression based on clinicopathologic factors.
- The risk stratification results of TSP-9 allow physicians and patients to make risk-aligned management decisions that can lead to improved health outcomes.

**References**


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