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# Performance evaluation of Bladder EpiCheck™ for NMIBC monitoring: European multi-center pivotal study

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## INTRODUCTION & OBJECTIVES

NMIBC requires surveillance currently performed by cystoscopy and cytology. Several urine assays are commercially available in Europe, but none has demonstrated performance sufficient to replace the current gold standard. The critical performance of such an assay would be achieving very high NPV in high grade tumors. A European multi-center study was conducted to assess the performance of Bladder EpiCheck™ (BE) for NMIBC recurrence.

## MATERIALS & METHODS

This was a multicenter, prospective, double-blinded, single arm, single visit, cohort study performed in 5 centers in Europe and Israel under IRB.

**Inclusion criteria:** Age ≥22, urothelial carcinoma undergoing cystoscopic surveillance at 3 months intervals, all UC resected within 12mths, able to produce 10 mL of urine, able to consent.

**Exclusion criteria:** Planning to undergo radical cystectomy or chemotherapy-radiation for UC.

BE is a urine assay using 15 proprietary methylation biomarkers to assess the presence of bladder cancer.

## RESULTS

Table 1.

|                              |                              | Range    | Mean (SD) |
|------------------------------|------------------------------|----------|-----------|
|                              | Age                          | 32-92    | 70 (10.9) |
|                              |                              | <b>N</b> | <b>%</b>  |
| <b>Gender</b>                | Male                         | 341      | 77.5      |
|                              | Female                       | 99       | 22.5      |
| <b>Ethnicity</b>             | Not Hispanic or Latino       | 440      | 100.0     |
|                              |                              |          |           |
| <b>Smoking status</b>        | Never smoked                 | 81       | 18.4      |
|                              | Former smoker                | 252      | 57.3      |
|                              | Current smoker               | 107      | 24.3      |
| <b>Occupational exposure</b> | No                           | 231      | 52.5      |
|                              | Yes                          | 56       | 12.7      |
|                              | Don't know / cannot remember | 153      | 34.8      |

Table 2.

| Parameter                         | % (95% CI)       |
|-----------------------------------|------------------|
| Sensitivity - overall             | 68.2 (52.4;81.4) |
| Sensitivity - Except Ta Low Grade | 91.7 (73.0;99.0) |
| Specificity                       | 88.0 (83.9;91.4) |
| NPV                               | 95.1 (91.9;97.3) |
| NPV - Except Ta Low Grade         | 99.3 (97.4;99.9) |
| PPV                               | 44.8 (32.6;57.4) |

Figure 1. ROC Curves: Without Ta Low Grade With Ta Low Grade

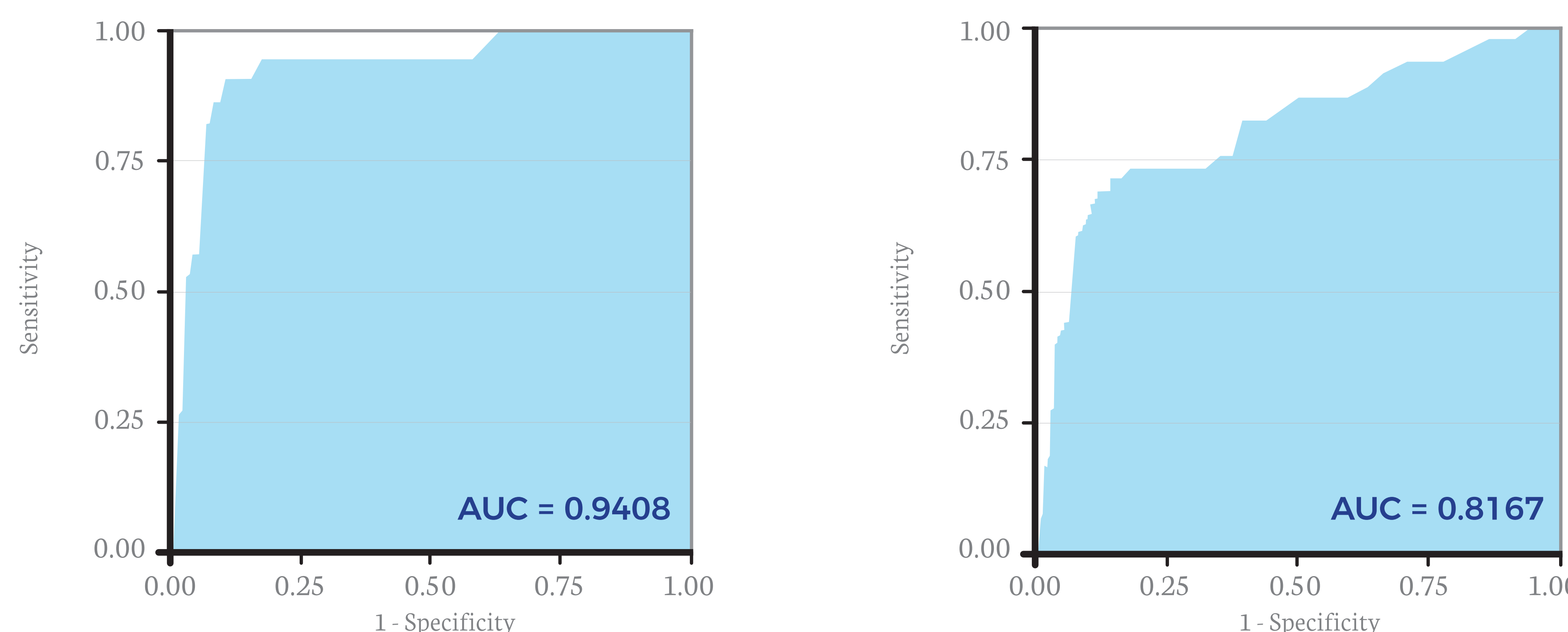


Table 1 presents the demographic data of the patients. 353 out of 440 patients had both BE and gold standard results and were included in the analysis. Study Endpoints are presented in Table 2 and Figure 1.

## CONCLUSIONS

A high NPV of 95.1% has been achieved for the entire cohort, with 68.2% overall sensitivity, but more importantly, the assay is able to exclude the presence of high grade tumors with NPV of 99.3% and sensitivity of 91.7%. These results, accompanied by high specificity of 88.0% could allow incorporation of this test in follow-up of NMIBC knowing that recurrence would be instantly detected with high confidence.

With BE the current burden of repeating cystoscopies and cytology tests could be decreased, which is beneficial for the urologists, the health system and of course, the patients.