

## P248 The 21-gene breast cancer assay: a roadmap of clinical evidence

### Poster Abstracts II

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**Goals:** There are an increasing number of commercially available genomic assays available for clinical practice. Assays are developed and validated through a variety of approaches, resulting in varying levels of evidence supporting their ability to guide treatment decisions. By establishing consistent standards for clinical evidence, clinicians can evaluate these assays based on the same criteria.

**Methods:** Peer-reviewed articles, presentations, and oncology guidelines were reviewed to identify studies that generated clinical evidence on the validation and utility of the 21-gene invasive breast cancer assay.

**Results:** The 21-gene assay was analytically validated for accuracy, precision, and reproducibility using 447 samples from three independent studies. Robust clinical validation was established in two prospectively-designed studies of 1319 patient samples which demonstrated prognosis (n=?668) and prediction of chemotherapy benefit (n=?651). These findings were consistent in four confirmation and eight supportive studies. Additional studies have shown an association of the assay result with local- and late- (>5?yr) recurrence. Clinical utility has been established through international studies with standardized methodologies; use of the assay changes treatment recommendations in ?30% of patients and results in a decrease in chemotherapy use. Worldwide market analyses demonstrate that the assay is cost-effective or -saving.

**Conclusion:** Rigorous analytical and clinical validation of the 21-gene assay resulted in subsequent studies that confirmed the robust performance in the node-negative and -positive setting with respect to both prognosis and prediction of chemotherapy benefit. Clinical utility studies have consistently shown that the assay provides actionable information to individualize treatment based on tumor biology. Assay development and consistency of findings has led to the inclusion by payers and international guideline committees as standard of care for patients with ER+, HER2?, early stage, invasive breast cancer and has led to the incorporation into the NCCN<sup>®</sup>, ASCO<sup>®</sup>, St. Gallen, and ESMO<sup>®</sup> guidelines and to recommendation by NICE. With the rapid increase of genomic assays now being used for clinical management of disease, there is a burden of proof to demonstrate rigorous development, analytical validation, clinical validation, and clinical utility of genomic assays.