

Risk classification of breast cancer patients by the Recurrence Score assay: comparison to guidelines based on patient age, tumor size, and tumor grade

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Background: The large independent study of 668 NSABP B-14 patients (pts) validated that the Recurrence Score accurately predicts the likelihood of distant recurrence in pts with node negative, estrogen receptor positive breast cancer who were treated with tamoxifen alone. We sought to compare the classification of pts in this cohort by the Recurrence Score, and by current treatment guidelines (NCCN and St Gallen’s).

Subjects and Methods: Age, tumor size, and tumor grade were used to classify the 668 pts by the NCCN (N_{low} and N_{high}) and St Gallen’s criteria (SG_{low} , SG_{int} , SG_{high}). The 21 gene Recurrence Score assay was used to classify the 668 pts based on three pre-specified categories, RS_{low} ($RS < 18$), RS_{int} ($RS 18 - 30$), and RS_{high} ($RS \geq 31$). The Kaplan-Meier estimate of 10 yr distant recurrence-free survival ($DRFS_{10}$) was determined for the subgroups of pts.

Results: The % of pts in each category and their $DRFS_{10}$ is summarized below:

Category	NCCN		St Gallen		Recurrence Score	
	% of pts	$DRFS_{10}$	% of pts	$DRFS_{10}$	% of pts	$DRFS_{10}$
Low	7.9	0.93	7.9	0.95	50.6	0.93
Intermediate	-	-	33.2	0.91	22.3	0.86
High	92.1	0.85	58.8	0.81	27.1	0.69

The use of the Recurrence Score reclassifies a substantial number of patients. For example, of the pts classified N_{low} or SG_{low} , 72% were identified by RS as RS_{low} with $DRFS_{10}$ of 1.00, 22% were reclassified as RS_{int} with $DRFS_{10}$ of 0.82, and 6% were reclassified as RS_{high} with $DRFS_{10}$ of 0.57. Of the very large number of pts classified N_{high} , 49% were reclassified by RS as RS_{low} with $DRFS_{10}$ of 0.92, 22% were reclassified as RS_{int} with $DRFS_{10}$ of 0.86, and 29% were identified as RS_{high} with $DRFS_{10}$ of 0.70. Of the of pts classified SG_{high} , 42% were identified by RS as RS_{low} with $DRFS_{10}$ of 0.92,

22% were reclassified as RS_{int} with $DRFS_{10}$ of 0.82, and 36% were reclassified as RS_{high} with $DRFS_{10}$ of 0.67.

Conclusion: The Recurrence Score, which is based on tumor gene expression, more accurately identifies the risk of distant recurrence than does the NCCN and St Gallen's guidelines which rely on age, tumor size, and tumor grade.