Clinical and Demographic Factors Associated with Discordant Oncotype (RS) and MammaPrint (MP) Scores in Patients with Hormone-Positive (HR+) Breast Cancer (BC). An Analysis of the National Cancer Database (NCDB)

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SAN ANTONIO BREAST CANCER SYMPOSIUM® DECEMBER 9-12, 2025 HENRY B. GONZALEZ CONVENTION CENTER • SAN ANTONIO, TX

BACKGROUND

Genomic assays like Oncotype (RS) and MammaPrint (MP) guide chemotherapy decisions in early-stage ER positive breast cancer.

Discordance between the two tests is not uncommon, leaving clinicians and patients uncertain, and there is a paucity in evidence to guide management in this scenario.

OBJECTIVES

- Evaluate the clinical and demographics features of the patients with discordant vs concordant RS/MP results
- Evaluate chemotherapy utilization patterns in discordant groups and identify factors associated with receiving chemotherapy.

METHODS

- The 2022 NCDB PUF was used to include non-metastatic female BC patients aged more than 18 years.
- Inclusion criteria were N0-1, M0 patients with T1-4, estrogen and/or progesterone receptor-positive, and HER2-negative, who have undergone both RS and MP. To maximize the patients we allowed unknown T, N and M status.
- Demographics and clinical features of patients having concordant results were compared to patients having discordant results, using univariate analysis.
- Discordant cohort was divided into High MP/Low RS, and High RS/Low MP and tumor and patient characteristics were compared using univariate analysis.
- Furthermore, each discordant cohort was then divided based on the receipt of chemotherapy and patient characteristics were compared using univariate analysis

CONCLUSION

When MP and RS are both ordered in the same patient, discordance is fairly common at about 35%, with most cases showing the pattern of high MP and low RS (92%).

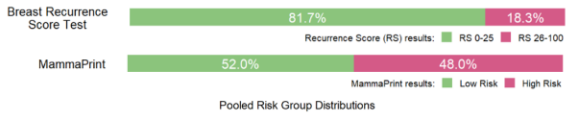
Discordant results were seen more often in Blacks and other minority patients, and in those with ductal histology, higher-grade tumors, and node-negative disease.

Chemotherapy use was similar whether patients had high MP/low RS or the reverse, suggesting that clinicians rely more on the overall clinical picture than on a single genomic assay when the results don't align.

The limitation of this study is its retrospective design, which shows associations rather than causality and is further constrained by limited survival data due to the small number of events. Prospective studies are needed to clarify the management of discordant cases and to understand racial differences in genomic profiling better.

RESULTS

- Out of 463,103 patients who underwent MP and/or RS, 2,014 had both MP and RS results, of which **35.25%** (N=710) exhibited discordance in results.



	MammaPrint Low	MammaPrint High	Total
RS 0–25	991 (49.2%)	654 (32.5%)	1645 (81.7%)
RS 26–100	56 (2.8%)	313 (15.5%)	369 (18.3%)
Total	1047 (52.0%)	967 (48.0%)	2014 (100.0%)

Breast Recurrence Score vs MammaPrint

		Discordant (710)	Concordant (1304)	p-value
Age (mean years (SD))		56.8 (12.0)	56.9 (11.4)	0.93
Race (n (%))	Black	71 (10)	91 (7.1)	**0.011**
	White	577 (82)	1,114 (87)	
	Other	57 (8.1)	78 (6.1)	
Histology (n (%))	Ductal	583 (85)	1,008 (79)	**<0.001**
	Ductal and Lobular	20 (2.9)	75 (5.9)	
	Lobular	79 (12)	199 (16)	
Grade (n (%))	Well Diff	108 (15)	297 (23)	**<0.001**
	Mod Diff	445 (63)	768 (60)	
	Poorly Diff	151 (21)	225 (17)	
Pathological T (n (%))	T1	460 (59)	993 (76)	0.27
	T2	232 (33)	405 (31)	
	T3	17 (2.4)	51 (3.9)	
	T4	1 (0.1)	2 (0.2)	
N stage (n (%))	N0	489 (70)	816 (64)	**0.005**
	N1	211 (30)	467 (36)	
Chemotherapy (n (%))	Received	294 (41)	311 (24)	**<0.001**
	Did not Receive	416 (59)	993 (76)	
Menopausal Status (n (%))	Premenopausal	233 (33)	418 (32)	0.73
	Postmenopausal	477 (67)	886 (68)	

- Discordance was more common among Black and other minority patients, those with ductal histology, grade 2-3 tumors, and node-negative disease.
- Chemotherapy utilization was higher in the discordant group compared to concordant group (41% vs 24%, p<0.001)

RESULTS

- Of 710 discordant cases, 92.1% (n=654) had high MP/low RS, while 7.8% (n=56) had low MP/high RS
- High MP/Low RS patients were more likely to be Black or from other minority groups, have ductal and poorly differentiated tumors, and be premenopausal.

		High MP/Low RS (654)	Low MP/High RS (56)	P-value
Age (mean years (SD))		56.6 (12.1)	58.9 (10.0)	0.23
Race (n (%))	Black	69 (11)	2 (3.6)	0.18
	White	526 (81)	51 (91)	
	Other	54 (8.3)	3 (5.4)	
Histology (n (%))	Ductal	547 (87)	36 (65)	**<0.001**
	Ductal and Lobular	19 (3.0)	1 (1.8)	
	Lobular	61 (9.7)	18 (33)	
Grade (n (%))	Well Diff	94 (14)	14 (25)	**0.016**
	Mod Diff	409 (63)	36 (65)	
	Poorly Diff	146 (22)	5 (9.1)	
Pathological T (n (%))	T1	425 (65)	35 (63)	0.89
	T2	212 (32)	20 (36)	
	T3	16 (2.4)	1 (1.8)	
	T4	1 (0.2)	0	
N stage (n (%))	N0	448 (70)	41 (73)	0.57
	N1	196 (30)	15 (27)	
Chemotherapy (n (%))	Received	271 (41)	23 (41)	0.96
	Did not Receive	383 (59)	33 (59)	
Menopausal Status (n(%))	Premenopausal	224 (34)	9 (16)	**0.005**
	Postmenopausal	430 (66)	47 (84)	

- Chemotherapy utilization was equal in both discordant groups, 41% in each group
- Younger patients were more likely to receive chemotherapy in both discordant cohorts.
  - High MP/low RS (51.9 years vs 59.9 years, p<0.001)
  - Low MP/high RS (55.6 years vs 61.2 years, p=0.025)
- Factors predicting chemotherapy utilization in high MP/low RS group:
  - Higher median oncotype score (20 vs 17, p<0.001)
  - Premenopausal status (49% vs 23%, p<0.001)
  - Ductal histology (91% vs 84%, p=0.023)
  - N1 stage (46% vs 19%, P<0.001)
  - Grade 3 disease (33% vs 15%, p<0.001)
  - Higher T stage (T4: 0.4% vs 0%, T3: 2.6% vs 2.3%, T2: 41% vs 26%; p<0.001)

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