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SUPPLEMENTAL DATA

Conditional survival nomogram for dynamic prognostic prediction in older women with surgically treated breast cancer

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Table S1. Follow-up characteristics and outcome status of the overall study cohort, training cohort and validation cohort

Item	Overall	Training	Validation
Patients	44,354	31,047	13,307
Breast cancer-specific deaths	4,416	3,078	1,338
Non-breast-cancer deaths	12,734	8,976	3,758
Censored patients	27,204	18,993	8,211
Median follow-up, months	**103**	**103**	**103**
Number at risk, 3 years	38,514	26,917	11,597
Number at risk, 5 years	34,159	23,864	10,295
Number at risk, 10 years	6,716	4,678	2,038

Table S2. Baseline characteristics of high-risk versus low-risk groups in the training and validation cohorts

Characteristic		Training cohort			Validation cohort		
		High-risk (n=5,420)	Low-risk (n=25,627)	SMD	High-risk (n=2,300)	Low-risk (n=11,007)	SMD
T Stage	T1	319 (5.9)	19482 (76.0)	2.110	113 (4.9)	8351 (75.9)	2.175
	T2	3381 (62.4)	5564 (21.7)		1419 (61.7)	2387 (21.7)	
	T3	951 (17.5)	450 (1.8)		432 (18.8)	213 (1.9)	
	T4	769 (14.2)	131 (0.5)		336 (14.6)	56 (0.5)	
N Stage	N0	1708	21895	1.384	708	9393 (85.3)	1.406

		(31.5)	(85.4)		(30.8)		
	N1	1891 (34.9)	3441 (13.4)		800 (34.8)	1490 (13.5)	
	N2	1068 (19.7)	226 (0.9)		478 (20.8)	89 (0.8)	
	N3	753 (13.9)	65 (0.3)		314 (13.7)	35 (0.3)	
M Stage	M0	5004 (92.3)	25609 (99.9)	0.402	2104 (91.5)	11000 (99.9)	0.427
	M1	416 (7.7)	18 (0.1)		196 (8.5)	7 (0.1)	
Grade	G1	103 (1.9)	8687 (33.9)	1.415	49 (2.1)	3747 (34.0)	1.364
	G2	1602 (29.6)	12861 (50.2)		719 (31.3)	5501 (50.0)	
	G3/4	3715 (68.5)	4079 (15.9)		1532 (66.6)	1759 (16.0)	
Subtype	HR-/HER2-	1616 (29.8)	1309 (5.1)	0.828	690 (30.0)	561 (5.1)	0.822
	HR-/HER2+	379 (7.0)	559 (2.2)		171 (7.4)	264 (2.4)	
	HR+/HER2-	2821 (52.0)	21984 (85.8)		1210 (52.6)	9448 (85.8)	
	HR+/HER2+	604 (11.1)	1775 (6.9)		229 (10.0)	734 (6.7)	
Age	70-74	1188 (21.9)	11215 (43.8)	0.653	506 (22.0)	4851 (44.1)	0.660
	75-79	1205 (22.2)	7457 (29.1)		515 (22.4)	3190 (29.0)	

	80-84	1455 (26.8)	4262 (16.6)		590 (25.7)	1819 (16.5)	
	85+	1572 (29.0)	2693 (10.5)		689 (30.0)	1147 (10.4)	
Surgery	BCS	1864 (34.4)	18331 (71.5)	0.802	759 (33.0)	7996 (72.6)	0.865
	Mastectomy	3556 (65.6)	7296 (28.5)		1541 (67.0)	3011 (27.4)	
Chemotherapy	No/Unknown	3431 (63.3)	22301 (87.0)	0.571	1436 (62.4)	9563 (86.9)	0.586
	Yes	1989 (36.7)	3326 (13.0)		864 (37.6)	1444 (13.1)	
Radiation	None/Unknown	3019 (55.7)	12323 (48.1)	0.153	1293 (56.2)	5139 (46.7)	0.192
	Yes	2401 (44.3)	13304 (51.9)		1007 (43.8)	5868 (53.3)	
Marital Status	Married	1772 (32.7)	11574 (45.2)	0.263	744 (32.3)	4952 (45.0)	0.266
	Unknown	274 (5.1)	1298 (5.1)		122 (5.3)	580 (5.3)	
	Unmarried	3374 (62.3)	12755 (49.8)		1434 (62.3)	5475 (49.7)	
Race	Black	597 (11.0)	1919 (7.5)	0.124	265 (11.5)	778 (7.1)	0.161
	Other	378 (7.0)	2000 (7.8)		145 (6.3)	860 (7.8)	
	White	4445 (82.0)	21708 (84.7)		1890 (82.2)	9369 (85.1)	

Risk groups were defined using a linear-predictor cutoff of 1.149 derived from maximally selected rank statistics in the training cohort. SMD > 0.1 is generally considered to indicate a meaningful between-group difference. Group-level p-values for all variables were < 0.001 (chi-square test). **Abbreviations**: BCS, breast-conserving surgery; G, histological grade; HER2, human epidermal growth factor receptor 2; HR+/HR−, hormone receptor-positive/hormone receptor-negative; M, distant metastasis; N, regional lymph node involvement; n, number of patients; SMD, standardized mean difference; T, primary tumor.

Table S3. Fine–Gray competing risks regression analysis for breast cancer-specific mortality in the training cohort

Variable	SHR (95% CI)	*p* value
N stage		
N0	Reference	—
N1	1.963 (1.788–2.154)	<0.001
N2	3.112 (2.742–3.533)	<0.001
N3	3.966 (3.425–4.592)	<0.001
M stage		
M0	Reference	—
M1	3.566 (3.014–4.220)	<0.001
T stage		
T1	Reference	—
T2	2.480 (2.253–2.730)	<0.001
T3	3.499 (3.042–4.026)	<0.001

T4	3.505 (2.981–4.121)	<0.001
Grade		
Grade 1	Reference	—
Grade 2	1.847 (1.614–2.112)	<0.001
Grade 3/4	2.974 (2.571–3.441)	<0.001
Subtype		
HR−/HER2−	Reference	—
HR−/HER2+	0.667 (0.553–0.804)	<0.001
HR+/HER2−	0.549 (0.492–0.612)	<0.001
HR+/HER2+	0.555 (0.479–0.643)	<0.001
Age (years)		
70–74	Reference	—
75–79	1.285 (1.164–1.417)	<0.001
80–84	1.675 (1.513–1.854)	<0.001
≥85	1.991 (1.784–2.223)	<0.001

Breast cancer-specific mortality was defined as the primary endpoint, with non-breast cancer mortality considered a competing event. The reference category for each categorical variable is indicated at baseline. **Abbreviations**: CI, confidence interval; HER2, human epidermal growth factor receptor 2; HR+/HR−, hormone receptor-positive/hormone receptor-negative; M, distant metastasis; N, regional lymph node involvement; SHR, subdistribution hazard ratio; T, primary tumor.