

means to effect change in health care. The example we gave was the adoption of team training.

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RESEARCH LETTER

Use of Breast Reconstruction After Mastectomy Following the Women's Health and Cancer Rights Act

To the Editor: Despite the quality-of-life benefits of breast reconstruction for women who have undergone mastectomy for breast cancer,¹ less than 20% of eligible patients have this procedure done.² Considerably lower reconstruction rates occur in many geographic regions and in some racial and ethnic groups.² Low utilization has been attributed to nonuniform coverage of breast reconstruction by insurers who viewed the procedure as primarily cosmetic.³ For this reason, the Women's Health and Cancer Rights Act (WHCRA), which mandated insurance coverage of breast reconstruction after mastectomy, was implemented in 1999,⁴ followed in 2001 by additional legislation imposing penalties on noncompliant insurers.⁵ We assessed the impact of the WHCRA on practice patterns related to breast reconstruction.

Methods. All women undergoing mastectomy for breast cancer from 1998 to 2002 were identified using the Surveillance, Epidemiology, and End Results (SEER) program pub-

lic use data file. The SEER database includes 13 separate state and regional registries representing approximately 26% of the US population.⁶ Time trends in the proportion of women undergoing breast reconstruction within 4 months of mastectomy were assessed using the Cochran-Armitage trend test; SEER does not provide data on subsequent therapy. Variations in reconstruction rates across geographic regions and patient subgroups were examined for 2000 to 2002, the period following implementation of the WHCRA. Race/ethnicity was self-designated and was assigned by the SEER program through medical record abstraction.

The primary dependent variable of interest was receipt of breast reconstruction. The effects of treatment year and geographic treatment location were assessed in 2 stepwise multiple logistic regression models that controlled for demographic characteristics (patient age, marital status, and race/ethnicity) and disease severity (stage of disease and use of adjuvant radiotherapy). The Wald test and the likelihood ratio test were used to test the significance of individual predictive variables, and the model χ^2 statistic was applied to test the overall significance of the models. The study had an estimated power of 80% to detect a 1.6% difference in reconstruction rates across years, with a type I error of .05. All analyses were performed using SAS software, version 9.1 (SAS Institute Inc, Cary, NC).

Results. Among the 51 184 women with breast cancer treated with a mastectomy between 1998 and 2002, 16.5% underwent reconstruction. Annual rates of reconstruction did not change significantly over time ($P = .68$ for trend) (TABLE 1). Wide geographic variations in reconstruction rates persisted in the period after WHCRA passage (TABLE 2). In 2000-2002, adjusted regional rates varied more than 7-fold, from 4.5% in Alaska to 34.7% in Atlanta, Ga. Compared with rates before passage of the WHCRA, reconstruction rates significantly increased in 3 of 13 registries and decreased in 2 of 13 registries, with no significant change across the total sample population.

Although mastectomy rates varied somewhat across SEER regions, there was no significant correlation between re-

Table 1. Trends in the Proportion of Women in the SEER Population Undergoing Breast Reconstruction After Mastectomy, 1998-2002, by Race/Ethnicity

	Undergoing Breast Reconstruction by Race/Ethnicity, %				Total
	White	African American	Hispanic	Asian†	
1998 (n = 10 639)	17.1	17.0	11.9	7.8	15.9
1999 (n = 10 750)	18.1	17.4	14.9	7.9	16.8
2000 (n = 10 230)	19.7	18.6	15.4	9.8	18.0
2001 (n = 9962)	17.0	14.3	13.7	8.9	15.6
2002 (n = 9388)	17.7	18.6	11.0	8.5	16.2
Adjusted OR (95% CI)*	1.00	0.54 (0.49-0.65)	0.48 (0.42-0.55)	0.36 (0.31-0.42)	
P Value		<.001*	<.001*	<.001*	.68‡

Abbreviations: CI, confidence interval; OR, odds ratio; SEER, Surveillance, Epidemiology, and End Results database.

*Logistic regression of race/ethnicity as a predictor of breast reconstruction for the 2000 through 2002 SEER population (N = 30 147), adjusted for patient age, marital status, stage of disease, use of adjuvant radiotherapy, and geographic location.

†Because of small sample sizes, Chinese, Japanese, Filipino, and Hawaiian patients were combined into the "Asian" category.

‡Change from 1998 to 2002, using the Cochran-Armitage trend test.

Table 2. Use of Breast Reconstruction Across SEER Registries Before and After Passage of the WHCRA

SEER Registry	Undergoing Breast Reconstruction, Adjusted % (No.)*		P Value†
	Before WHCRA (1998)	After WHCRA (2000-2002)	
San Francisco, Calif	17.2 (212)	14.4 (720)	.02
Connecticut	11.1 (106)	17.7 (580)	<.001
Metropolitan Detroit, Mich	22.9 (316)	24.1 (1068)	.11
Hawaii	7.2 (28)	8.1 (108)	.57
Iowa	8.9 (116)	11.4 (510)	.02
New Mexico	14.8 (68)	22.3 (376)	<.001
Seattle, Wash	11.9 (114)	10.0 (474)	<.001
Utah	17.0 (79)	17.9 (330)	.94
Metropolitan Atlanta, Ga	35.3 (241)	34.7 (1015)	.68
Alaska	15.4 (4)	4.5 (6)	.10
San Jose–Monterey, Calif	17.7 (127)	18.6 (496)	.54
Los Angeles, Calif	13.6 (281)	13.4 (1052)	.43
Rural Georgia	12.5 (4)	13.2 (19)	.94
Total	15.9 (1696)	16.8 (6754)	.23

Abbreviations: SEER, Surveillance, Epidemiology, and End Results database; WHCRA, Women's Health and Cancer Rights Act.

*Adjusted for patient age, marital status, race/ethnicity, stage of disease, and use of adjuvant radiotherapy.

†Comparison of pre-WHCRA and post-WHCRA periods using χ^2 test; 1999 data were excluded because it was a transition year.

gional rates of mastectomy and breast reconstruction. Similarly, the WHCRA did not eliminate disparities in the use of breast reconstruction among racial and ethnic subgroups (Table 1). White women continued to have the highest rates of breast reconstruction after mastectomy. Compared with whites, black patients were considerably less likely to undergo breast reconstruction (adjusted odds ratio [OR], 0.54; 95% confidence interval [CI], 0.49-0.65), as were Hispanic patients (OR, 0.48; 95% CI, 0.42-0.55) and Asian patients (OR, 0.36; 95% CI, 0.31-0.42).

Comment. Our results indicate that the WHCRA has not significantly increased the overall use of breast reconstruction or reduced variations across geographic regions and patient subgroups. Of note is that the SEER population, while the most nationally representative registry of breast cancer patients, may have a slightly higher socioeconomic status and better access to specialist surgeons than the US population as a whole.⁷ Our results may therefore have overestimated the use of reconstruction overall, but this would not confound our analyses of trends over time or comparisons across regions and subgroups.

These data suggest that factors other than insurance coverage are driving practice patterns in breast reconstruction. The use of breast-conserving therapy varies widely and is higher in teaching hospitals and centers located in urban areas.⁸ Therefore, physician factors and practice style may play a role in the use of breast reconstruction. On the patient level, low rates of breast reconstruction in some patient subgroups, particularly among African American women, may reflect a lower level of patient involvement in the clinical decision-making process or less knowledge about breast reconstruction options.⁹ Further research aimed at understanding and reducing unwanted variations should focus on the roles of patients' preferences, physicians' attitudes about reconstruction, and access to specialist surgeons performing these procedures.

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