

Managed Care Enrollment and Chronically Disabled Women With Breast Cancer

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Objective: To assess whether managed care enrollment or healthcare utilization level among women enrolled in Medicare because of disability affects stage at diagnosis and treatment of breast cancer.

Study Design: Retrospective study using the Surveillance, Epidemiology, and End Results–Medicare database. We compared breast cancer stage at diagnosis and treatment among women with disabilities enrolled in Medicare managed care versus fee-for-service (FFS) Medicare. Women enrolled in FFS Medicare were classified into levels of healthcare utilization during the 6 to 18 months before breast cancer diagnosis.

Methods: Controlling for confounders, we used regression models to determine the effects of managed care enrollment and healthcare utilization level on earlier stage at diagnosis and treatment of breast cancer.

Results: Disabled patients enrolled in FFS Medicare without contact with the healthcare system and those with fewer than 12 physician visits during the 6 to 18 months before breast cancer diagnosis were more likely than disabled patients enrolled in Medicare managed care to be diagnosed as having breast cancer at a late stage. There was no difference between women enrolled in Medicare managed care versus women enrolled in FFS Medicare having at least 12 physician visits during the 12-month period. Breast cancer treatment for women with disabilities did not vary across managed care enrollment or healthcare utilization level.

Conclusion: Managed care enrollment or increased contact with healthcare providers could result in earlier stage at breast cancer diagnosis.

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Recent studies¹⁻³ have found that cancer care and associated outcomes for working-age disabled Medicare beneficiaries may differ from those of the nondisabled. Physical and mental disabilities are common in the United States, estimated at 1 in 5 Americans⁴ or 12% of Americans aged 21 through 64 years.⁵ Medicare provides insurance coverage to individuals who have qualified for Social Security Disability Insurance (SSDI) for at least 29 months.² In 2004, 3.7% of the adult American population younger than 65 years received SSDI benefits.⁶ Most individuals enrolled in SSDI are disabled workers with long-term physical or mental disabilities that prevent work, although some qualify because they are adults who developed a serious disability before age 22 years. Having disabilities does not free a beneficiary from cancer risk; therefore, it is important to identify how to improve care among this vulnerable population.

Findings from studies⁷⁻⁹ among Medicare-enrolled older populations suggest that the choice of fee-for-service (FFS) or managed care is related to cancer stage at diagnosis and treatment. Others have found that more frequent physician contact may facilitate early detection of cancer and suggest that managed care promotes greater use of primary care. Keating et al¹⁰ found that older women enrolled in FFS Medicare who had contact with a primary care physician during the 2 years preceding a breast cancer diagnosis were less likely to be diagnosed at an advanced stage than other women. While disabled persons are more likely than nondisabled persons to have health conditions that require frequent interactions with clinicians, it seems counterintuitive that the 2 groups are equally likely to be diagnosed at an advanced cancer stage.² Although managed care enrollment and healthcare utilization level seem to affect cancer detection and outcome, their effects among Medicare beneficiaries with disabilities have not been evaluated (to our knowledge) and may differ from those among the general population of Medicare beneficiaries.

We designed this study to assess whether prediagnosis healthcare utilization level or Medicare managed care enrollment at diagnosis affects stage at diagnosis and treatment among disabled women with breast cancer. We hypothesized that women enrolled in FFS Medicare with higher healthcare utilization levels and women enrolled in Medicare managed care have superior breast cancer outcomes. We focused on patients with breast cancer in this study because it is a common cancer that is frequently diagnosed in

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women younger than 65 years and should not be related to the presence of physical or mental disability. In addition, although there are well-established evidence-based guidelines for the screening and treatment of this disease,¹¹⁻¹³ disparities in breast cancer outcomes have been identified for the disabled¹ and for other vulnerable groups in the United States.

METHODS

Data

We used Surveillance, Epidemiology, and End Results (SEER) cancer registry data linked to Medicare enrollment records and utilization data (SEER-Medicare). SEER, a population-based cancer registry sponsored by the National Cancer Institute,¹⁴ collects information on cancer incidence and survival from 16 population-based cancer registries and from 2 special registries that include approximately 26% of the US population. The information collected by SEER includes patient demographic characteristics, primary tumor site, tumor stage, first course of treatment (including surgery and irradiation), follow-up for vital status, and cause of death as recorded on the death certificate.¹⁵

To facilitate health services research, cancer cases reported to SEER have been matched to the Medicare master enrollment file, including cases eligible on the basis of age, disability, or end-stage renal disease. Therefore, we were able to identify all patients who were enrolled in Medicare on the basis of disability who developed breast cancer. For Medicare enrollees who do not participate in a managed care plan, claims data for hospitalizations, outpatient visits, and physician visits are available through the Medicare Provider Analysis and Review File, the outpatient file, and the national claims history file. The SEER-Medicare database includes cancer cases reported to SEER from 1973 through 2002 and all Medicare claims for persons diagnosed as having cancer from 1991 through 2003.

Patients

Included in our study were women diagnosed as having in situ or invasive breast cancer from July 1, 1992, through December 31, 2002. We included women diagnosed as having breast cancer as their first cancer between the ages of 21 and 64 years. Excluded from our study were patients diagnosed as having cancer less than 18 months after enrollment in Medicare for disability, as patterns of healthcare use before diagnosis cannot be determined in these individuals. Women had to have remained enrolled in Medicare managed care or FFS Medicare or from 18 months before cancer diagnosis until 6 months after diagnosis or death. We chose this period to be able to evaluate healthcare utilization before cancer diagnosis in women for whom we have healthcare claims (FFS enrollees). Only 295 patients switched between Medicare managed care and FFS Medicare during

that period and were excluded. Women whose month of diagnosis was missing and patients whose cancer was diagnosed at autopsy or was first noted on the death certificate were also excluded. We limited our cohorts to women with ductal or lobular histologic findings, the most common tumor types.

Measures

SEER data tumor characteristics include histologic type (ductal, lobular, or other), tumor grade (well differentiated, moderately differentiated, poorly differentiated, or unknown), estrogen receptor status (positive, negative, or unknown or not done), progesterone receptor status (positive, negative, or unknown or not done), tumor size (in centimeters), and node status (positive, negative, or unknown or not done). Treatment information includes the following: whether surgery was performed, performance of mastectomy or lumpectomy, inclusion of lymph node sampling (sentinel node biopsy or axillary dissection), use of irradiation with lumpectomy, and breast reconstruction following mastectomy.

We stratified patients with disabilities who were receiving FFS Medicare care into 3 groups based on the level of healthcare utilization before cancer diagnosis; Medicare files do not include complete healthcare claims data for Medicare managed care enrollees. We used the number of hospital visits and the number of days of physician visits during the 6 to 18 months before breast cancer diagnosis. We defined physician visit as a visit to any physician with an evaluation and management Health Care Financing Administration Common Procedural Coding System code of 99200 to 99499. We chose the 12-month period because utilization during that year was recent enough to reflect contemporary levels of non-breast cancer care. Similarly, we excluded the peridiagnostic period (when increased healthcare utilization is expected because of evaluation, diagnosis, and treatment of breast cancer) because it might overestimate usual levels of healthcare. Women who had no hospital or physician visits during the 6 to 18 months before breast cancer diagnosis were defined as our “no-use” FFS Medicare cohort. Those who had no hospital visits and who had fewer than 12 physician visits during that year were considered to be our “low-use” FFS Medicare cohort. Women with at least 1 hospitalization or with at least 12 physician visits were defined as our “high-use” FFS Medicare cohort. We also calculated the modified Charlson Comorbidity Index (CCI) for the FFS Medicare enrollees.^{16,17}

Statistical Analysis

We compared demographic and tumor variables between the Medicare managed care and FFS Medicare cohorts, as well as between the Medicare managed care and 3 FFS Medicare cohorts (no use, low use, and high use). χ^2 Test was used for

categorical variables, and 2-sided *t* test was used for continuous variables.

We used ordered logistic regression analysis to predict later stage at diagnosis among the Medicare managed care cohort, the total FFS Medicare cohort, and the 3 FFS Medicare use cohorts. These analyses controlled for marital status (married, not married, or unknown), race/ethnicity (black, nonblack, or unknown), diagnosis year (continuous), age at diagnosis (continuous), and SEER registry and excluded women with unknown stage at diagnosis.

For patients with invasive nonmetastatic breast cancer (stages I-III), we compared tumor characteristics among the cohorts and determined the proportions of these patients who underwent treatment. Among those who were treated, we determined whether patients underwent mastectomy or lumpectomy, lymph node sampling (sentinel node biopsy or axillary dissection), irradiation after lumpectomy, and breast reconstruction after mastectomy. We developed 5 logistic regression models determining the effects of managed care enrollment and healthcare utilization level on treatment (surgery type, irradiation following lumpectomy, reconstruction following mastectomy, axillary sampling, and standard care), controlling for age, marital status, race/ethnicity, geographic location by registry, diagnosis year, estrogen receptor status, and tumor stage, grade, size, and node positivity. We also determined the proportion of patients who received “standard” care (mastectomy with lymph node sampling, or lumpectomy with lymph node sampling and irradiation) and determined the effects of health plan enrollment and healthcare utilization level on standard care using logistic regression analysis.

Because our study used preexisting data without personal identifiers, the Human Subjects Committee of the University of Minnesota’s Institutional Review Board determined that it was exempt from review. We performed statistical analysis using SAS version 9.1 (SAS Institute, Cary, North Carolina). $P < .05$ was considered statistically significant.

RESULTS

During our study period, we identified 3852 women with disabilities who developed breast cancer (Table 1). Of these, 424 (11.0%) were enrolled in Medicare managed care, which is comparable to the 9% Medicare managed care enrollment for beneficiaries enrolled in Medicare because of disability in 1999.¹⁸ We evaluated healthcare use among 3428 women with disabilities (89.0%) enrolled in FFS Medicare. Among women with disabilities enrolled in FFS Medicare, 19.1% had at least 1 hospitalization during the 6 to 18 months before breast cancer diagnosis, and 8.3% had 2 or more hospitalizations. The median number of days with physician visits dur-

ing this year was 12 days, and 9.7% had no physician contact during the prediagnosis period.

The CCI was 0 in 75.7% of women and 2 or higher in 8.3% of women. The CCI is calibrated to predict the likelihood of mortality. Long-term disability that meets the qualifications for SSDI benefits reflects functional limitations. Therefore, the CCI distribution is consistent with theoretical properties but is not particularly informative for this group. In addition, because the CCI is confounded by our healthcare utilization level measure (persons with no use will have a CCI of 0) and because we were unable to calculate the CCI for the Medicare managed care cohort, we did not include the CCI in our analysis. We categorized women in our FFS Medicare cohort only by their level of healthcare utilization.

In total, 326 women (9.5% of the FFS Medicare cohort) had no physician visits or hospitalizations and comprised the no-use cohort. A total of 1243 women (36.3% of the FFS Medicare cohort) had no hospitalizations and fewer than 12 days with physician visits and comprised the low-use cohort. Overall, 1859 women (54.2% of the FFS Medicare cohort) had at least 12 physician visits or at least 1 hospitalization and comprised the high-use cohort.

Compared with women enrolled in FFS Medicare, women enrolled in Medicare managed care were older and were more likely to be married (Table 1). Women in Medicare managed care were older than the women in the 3 FFS Medicare use cohorts. Women in Medicare managed care were more likely to be married than women in the FFS Medicare low-use and high-use cohorts. Compared with women enrolled in Medicare managed care, women enrolled in FFS Medicare were more likely to be diagnosed as having stage III or IV breast cancer (10.4% vs 6.7%, $P = .02$) and were as likely to be diagnosed as having in situ carcinoma of the breast (about 16% for each cohort, $P > .99$) when excluding patients with unknown stage. Women enrolled in FFS Medicare or Medicare managed care were equally likely to have unknown stage (3.3% vs 4.7%, $P = .13$). In multivariate analysis controlling for age, marital status, race/ethnicity, diagnosis year, and geographic location by registry, there was no statistically significant difference in later-stage diagnosis between the total FFS Medicare cohort and the Medicare managed care cohort (odds ratio [OR], 1.14; 95% confidence interval [CI], 0.94-1.40).

Compared with the Medicare managed care cohort, stage at diagnosis differed for the no-use and low-use FFS Medicare cohorts but not for the high-use FFS Medicare cohort. While 6.4% of Medicare managed care breast diagnoses were stage III or IV, there were 14.0% and 12.2% late-stage diagnoses in the no-use and low-use FFS Medicare cohorts, respectively (Table 1). In multivariate analysis, the no-use FFS Medicare cohort (OR, 1.47; 95% CI, 1.12-1.94) and the low-use FFS

Table 1. Demographic Characteristics Among Disabled Patients

Characteristic	Total (n = 3852)	Medicare Managed Care (n = 424)	Fee-for-service Medicare			
			Total (n = 3428)	No Use (n = 326)	Low Use (n = 1243)	High Use (n = 1859)
Age at diagnosis, mean (SD), y	54.8 (7.3)	57.5 (6.0)	54.5 (7.4) ^a	53.6 (8.0) ^a	54.1 (7.6) ^a	54.9 (7.2) ^a
Race/ethnicity, %						
Nonblack	75.0	76.6	74.7	71.8	74.4	75.5
Black	20.6	18.9	20.9	22.7	21.0	20.4
Unknown	4.4	4.5	4.4	5.5	4.6	4.1
Marital status, %						
Married	31.9	43.9	30.4 ^a	46.3	30.6 ^a	27.5 ^a
Not married	63.7	53.1	65.0	50.9	64.5	67.7
Unknown	4.4	3.1	4.6	2.8	4.9	4.7
Breast cancer stage, %						
In situ	16.3	16.0	16.3	11.7 ^b	17.0 ^a	16.6
I	35.5	40.1	35.0	36.8	31.0	37.3
II	35.2	32.8	35.5	34.4	36.7	34.9
III	6.3	4.3	6.5	6.7	8.0	5.5
IV	3.3	2.1	3.5	7.3	4.2	2.3
Unknown	3.4	4.7	3.3	3.1	3.1	3.4
Diagnosis year						
July 1992 to 1994	12.2	7.5	12.7 ^a	13.5 ^b	12.4 ^a	12.8 ^a
1995 to June 1997	15.7	10.4	16.4	15.3	17.9	15.6
July 1997 to 1999	19.1	18.9	19.1	17.8	18.5	19.7
2000 to 2002	53.0	63.2	51.8	53.4	51.2	51.9

SD indicates standard deviation.

^a*P* < .001 vs Medicare managed care, 2-sided *t* test or χ^2 test.

^b*P* < .01 vs Medicare managed care, 2-sided *t* test or χ^2 test.

Medicare cohort (OR, 1.26; 95% CI, 1.01-1.56) were significantly more likely to be diagnosed at a later stage than the Medicare managed care cohort (Table 2). The high-use FFS Medicare and Medicare managed care cohorts were equally likely to be diagnosed at a late stage (OR, 1.03; 95% CI, 0.84-1.26).

Most women diagnosed as having stage I to III breast cancer (98.3%) underwent some form of surgical treatment. There were no significant differences in surgery type (mastectomy vs lumpectomy), axillary sampling, reconstruction following mastectomy, or receipt of standard care between the Medicare managed care cohort and the 3 FFS Medicare use cohorts. The only significant difference in breast cancer treatment was greater use of irradiation after lumpectomy in the Medicare managed care cohort than in the no-use FFS Medicare cohort (76.2% vs 64.7%, *P* = .04) (Table 3).

After adjustment for confounders using logistic regression models, there were no significant differences in treatment between the Medicare managed care and FFS Medicare cohorts (OR, 1.33; 95% CI, 0.96-1.83), although the OR for standard care in Medicare managed care patients versus FFS Medicare patients approached significance at *P* = .09 and pointed to higher levels of standard of care in the Medicare managed care population (data not shown). Comparing the Medicare managed care cohort with the 3 FFS Medicare use cohorts, there were no significant differences in treatment after adjustment for potential confounders (Table 4).

DISCUSSION

For women enrolled in Medicare because of disability, healthcare utilization level and managed care enrollment

■ **Table 2.** Probability of Later-stage Breast Cancer Diagnosis, Adjusted for Confounders^a

Variable	OR (95% CI)	P
Healthcare utilization level		
Medicare managed care	1 [Reference]	
Fee-for-service Medicare		
No use	1.47 (1.12-1.94)	.006
Low use	1.26 (1.01-1.56)	.04
High use	1.03 (0.84-1.26)	.81
Marital status		
Not married	1 [Reference]	
Married	0.74 (0.65-0.85)	<.001
Unknown	0.76 (0.56-1.04)	.09
Race/ethnicity		
Black	1 [Reference]	
Nonblack	0.80 (0.69-0.94)	.006
Unknown	0.90 (0.63-1.29)	.57
Diagnosis year, continuous	0.98 (0.95-1.00)	.05
Age at diagnosis, continuous	0.99 (0.98-0.99)	<.001

CI indicates confidence interval; OR, odds ratio.

^aControlling for geographic location by registry and excluding women with unknown breast cancer stage at diagnosis.

are associated with breast cancer stage at diagnosis but not with treatment. Women enrolled in Medicare managed care are as likely as women enrolled in FFS Medicare to be diagnosed at a late stage. This has been previously observed in the general population younger than 65 years.¹⁹ However, stage at diagnosis varied across levels of healthcare utilization. Patients enrolled in FFS Medicare who had no contact with the healthcare system and those with fewer than 12 physician visits during the period 6 to 18 months before their diagnosis were more likely than patients enrolled in Medicare managed care to be diagnosed as having breast cancer at a late stage. Our results are consistent with the literature showing a relationship between increased contact with healthcare providers and earlier stages at cancer diagnosis.¹⁰

We did not find that the type of Medicare enrollment affected breast cancer treatment. Women with disabilities having curable invasive breast cancer enrolled in FFS Medicare were

■ **Table 3.** Unadjusted Analysis of Treatment in Patients With Nonmetastatic Invasive Breast Cancer (Stages I-III Only)

Variable	%					
	Total (n = 2964)	Medicare Managed Care (n = 327)	Fee-for-service Medicare			
			Total (n = 2637)	No Use (n = 254)	Low Use (n = 940)	High Use (n = 1443)
Surgery type^a						
Lumpectomy	46.4	49.2	46.0	48.4	43.8	47.1
Mastectomy	51.9	49.2	52.1	50.0	54.4	51.1
Other or unknown	1.7	1.5	1.8	1.6	1.8	1.8
Irradiation after lumpectomy^b	71.1	76.2	70.4	64.7	69.1	72.2
Axillary sampling^c	92.2	92.7	92.2	90.6	92.4	92.3
Reconstruction after mastectomy^d	8.8	8.6	8.8	10.3	7.8	9.3
Standard care^e	79.5	82.9	79.1	77.6	79.3	79.2

^aUnknown for 0.4% of the total study population.

^bFor lumpectomy cases only; unknown for 4.4% of the total study population.

^cUnknown for 0.5% of the total study population.

^dUnknown for 6.7% of the total study population.

^eMastectomy with lymph node sampling, or lumpectomy with irradiation and lymph node sampling.

Table 4. Treatment ORs Adjusted for Confounders in Patients With Nonmetastatic Invasive Breast Cancer (Stages I-III)

Variable	Medicare Managed Care (n = 327)	Fee-for-service					
		No Use (n = 254)		Low Use (n = 940)		High Use (n = 1443)	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Lumpectomy ^a	1 [Reference]	1.14 (0.79-1.64)	.49	1.08 (0.81-1.44)	.61	1.08 (0.82-1.42)	.59
Irradiation after lumpectomy ^a	1 [Reference]	0.63 (0.36-1.12)	.11	0.77 (0.49-1.24)	.28	0.90 (0.58-1.41)	.66
Axillary sampling ^b	1 [Reference]	0.88 (0.48-1.63)	.68	1.08 (0.65-1.80)	.77	1.11 (0.68-1.81)	.67
Reconstruction after mastectomy ^a	1 [Reference]	1.09 (0.45-2.67)	.85	0.93 (0.44-1.94)	.84	1.02 (0.50-2.06)	.96
Standard care ^{b,c}	1 [Reference]	0.72 (0.47-1.10)	.13	0.74 (0.52-1.05)	.09	0.77 (0.55-1.08)	.13

CI indicates confidence interval; ORs, odds ratios.
^aControlling for age, marital status, race/ethnicity, geographic location by registry, diagnosis year, estrogen receptor status, and tumor grade, size, stage, and node positivity. All variables are categorical except for diagnosis year.
^bControlling for age, marital status, race/ethnicity, geographic location by registry, diagnosis year, estrogen receptor status, and tumor grade and size. All variables are categorical except for diagnosis year.
^cMastectomy with lymph node sampling, or lumpectomy with irradiation and lymph node sampling.

as likely to receive standard care as women with disabilities enrolled in Medicare managed care; however, the difference (OR, 1.33) approached statistical significance and may have reached significance if our sample size had been larger.

The SEER-Medicare database has some limitations. There is no information regarding individual economic status or educational attainment. We were unable to study healthcare utilization in the Medicare managed care cohort, and some women enrolled in Medicare managed care may have used little or no healthcare during the study period. Because the Medicare disability program is limited to working-age people with long-standing disabilities that prevent them from working, the results of our findings may not be generalizable to women with disabilities who are not enrolled in Medicare. However, the Medicare eligibility requirements apply equally to FFS Medicare and Medicare managed care cohorts. However, despite the study limitations, we were able to identify differences in breast cancer stage at diagnosis within a large healthcare program funded through the public purse.

Women with disabilities who were enrolled in FFS Medicare and had fewer than 12 physician visits during a 12-month period were more likely to be diagnosed at a later stage of breast cancer than those enrolled in Medicare managed care. Given that a difference was found in stage at diagnosis and but not in treatment, the disparities within this publicly insured population seem to occur before

diagnosis. It is plausible that disparities could be reduced or eliminated by promoting the use of primary and preventive care services among women who are less intensive users of healthcare within FFS Medicare.

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Take-away Points

Studies of cancer care in the disabled are limited.

- Programs and services geared to eliminate disparities in cancer care generally have not included the disabled as a target group.
- This research has relevance for many patients funded through public programs.
- Disparities in breast cancer stage at diagnosis should not exist for disabled women enrolled in Medicare.

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