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Quality of Post-treatment Care among Breast Cancer Survivors in the University of California Athena Breast Health Network (Athena)

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Abstract

Purpose—Multiple oncology providers are involved in the initial breast cancer treatment. To better understand the patterns and quality of post-treatment breast cancer care, we surveyed patients who had been treated at each of the five University of California (UC) Cancer Centers.

Methods—We identified breast cancer patients diagnosed in 2008–09 from hospital tumor registries; invitations for the mailed survey on post-treatment care were sent between September 2011 and November 2012. The survey requested information on the number and type of provider visits, discussion of key topics, use of treatment summaries (TS) and survivorship care plans (SCP).

Results—329 patients completed the survey. The mean age of respondents was 60.5 years and they were 3.2 years since diagnosis (range 1.6–4.8 years). 82% had continued post-treatment care at a UC facility, and they reported high numbers of clinical follow-up visits, with an average of >2 providers (range of 1–5). Surgery only patients reported an average of 4–5 office visits/year; patients who received surgery, radiation and chemotherapy reported 5–6 office visits/year. Overall, 45% of women reported receiving a TS; receipt of a SCP was reported by 59%, occurring significantly more often among those in follow-up at a UC ($p=0.004$).

Conclusions—Patients reported visits to multiple providers during their follow-up care, in excess of what is recommended by current guidelines. This was in spite of many women reporting that they had received a SCP.

Keywords

breast cancer; quality of care; treatment summary; survivorship care plan

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Introduction

It is now almost ten years since an Institute of Medicine (IOM) issued a report calling attention to the diverse medical, physical, and psychosocial needs of the post-treatment cancer survivor.¹ The report noted the lack of an evidence base for follow-up care after cancer treatments, including the appropriate frequency and type of surveillance for recurrence as well as relevant late effects of treatment. Post-treatment fragmentation in care was also highlighted in the IOM report.¹ To facilitate the better coordination of post-treatment care, until such an evidence base could be developed and validated, the IOM committee recommended that all patients should receive a treatment summary (TS) and survivorship care plan (SCP) to serve as a guide for survivors and their clinicians during follow-up care.

Today, there are more than 14 million cancer survivors in the United States, with 3 million breast cancer survivors.² Life expectancy for women with early stage breast cancer is excellent, and death is often related to competing causes of mortality. Thus, post-treatment coordination of care with primary care providers (PCPs) and attention to health promotion and chronic disease prevention is particularly important. As part of the Athena Breast Health Network of the University of California (Athena),² investigators at the five University of California (UC) NCI-designated comprehensive cancer centers have been examining how breast cancer survivorship care is delivered within their respective health systems. As a first step, we performed key informant interviews with health care providers to learn about how they were delivering post-treatment follow-up care, and perceived barriers and opportunities for providing better quality care. Those results are described in detail in a recent publication.³ We found that multiple providers (surgeons, radiation oncologists, medical oncologists) were all engaged in the follow-up care of patients, with little coordination among themselves, and no variation in the frequency and intensity of follow-up care related to the severity of illness or risk for recurrence. By their own report, TS and SCPs were not being provided systematically to patients, and PCPs were variably engaged in the follow-up care of patients.³

Based on these interview findings, we developed a survey that was administered to a sample of breast cancer survivors at each of the five UC Athena institutions to examine patient perceptions of post-treatment follow-up care. Survey results were also intended to inform quality improvement activities across the Athena institutions. The goal of this report is to describe the patient-reported post-treatment patterns of care and the frequency of visits and number of providers, especially in relationship to the ASCO breast cancer surveillance guidelines.^{4,5}

Methods and Procedures

Participant Recruitment

We obtained tumor registry listings for female patients with stage 0-III breast cancer diagnosed in 2008 and 2009. The number of patients available at each of the institutions varied from 180 to 382. Our goal was to survey approximately 100 respondents from each institution. Based on prior similar surveys, we anticipated that about 35% of those identified in the registry would be accessible and willing to participate in the survey.⁶⁻⁹ Thus, those institutions with smaller numbers of available patients sent letters of invitation to all potentially eligible patients while the larger institutions initially randomly sampled from among the two years of patient listings, with later supplementation to increase the response yield. Patients were sent a letter of invitation describing the study and how they had been identified from the tumor registry. They were asked to respond to the letter of invitation to let us know if they would be willing to participate. A second request was mailed to non-respondents. All study activities were approved using a UC-wide Institutional Review Board (IRB) Memorandum of Understanding with UC Los Angeles as the lead IRB.

Survey Content

The mailed survey was 30 pages in length and contained questions on the following: Demographic characteristics (age, education, ethnicity, race, language spoken at home, employment, marital status, number of children, health insurance, income); cancer history (stage, type of treatment, recurrence history); post-treatment care location (UC vs. non-UC); post-treatment providers; type of care received from different providers; frequency of follow-up visits and by which provider; types of services delivered by providers (e.g., nutrition, physical activity, general health and wellness, pain management, fatigue, emotional concerns); fertility concerns and information provision; provision of information or referrals on a broad range of survivorship services. We defined a treatment summary (TS) by asking patients specifically “Did any doctor, nurse, or other health professional ever give you a written summary of your diagnosis and cancer treatments such as chemotherapy, surgery and radiation after completing your treatments?” and we also asked who provided the TS.. We also inquired specifically about a survivorship care plan (SCP) by asking “Have you ever received written instructions from a doctor, nurse, or other health professional about when or where you should return or who you should see for routine cancer check-ups and follow-up after completing your initial cancer treatment?” This content was developed by the research team and was designed to complement the questions asked of the UC providers in an earlier study.³ Lastly, several standardized measures were either adapted or used directly to assess satisfaction with post-treatment care health status. For this report we include results from the SF-12 Physical and Mental Component Scales to assess comparability of patients who continued follow-up care at a UC medical center vs. not.¹⁰

Data Management and Statistical Methods

Analyses included descriptive statistics as well as multivariate logistic and linear regression modeling to examine type of providers seen, frequency of post-treatment surveillance by different providers, and whether patients received a TS or SCP. All patients responded to questions about the TS and SCP, but only those with continuing UC follow-up were

surveyed about the number and type of provider visits. All statistical analyses were done using SAS statistical software, version 9.1 (SAS Institute, Cary, NC). Chi-square tests (for categorical variables) and T-tests (for continuous variables) were used to compare respondents vs. non-respondents, as well as to compare women who received follow-up care at a UC vs. those who did not. Chi-square tests (for categorical variables) and ANOVAs (for continuous variables) were used to compare demographic and medical variables among the four treatment groups.

RESULTS

Recruitment Results and Patient Characteristics

Recruitment began in September 2011 and ended in November 2012, being rolled out at each of the five UC institutions during that time. The results of the mailed invitations and completed survey questionnaires are shown in Figure 1. We mailed invitations to 1475 potentially eligible women based on stage information. However, 134 were not accessible (either deceased or not contactable), leaving a potential sample of 1341. Of these only 494 (37%) responded to the invitation, and of these 388 were eligible and interested in participating. Ultimately, only 329 women returned a completed questionnaire representing 25% of those who received an invitation. The participation rates across the 5 institutions varied from 19% to 27%, with the site contribution ranging from 31 to 100 women.

We compared the demographic and medical characteristics of women who completed the questionnaire with those who did not respond or those we could not locate (known deceased excluded). Tumor registry data were used for these analyses. The majority of respondents and non-respondents were stage 0 or I, with no difference between the two groups. Significantly more of the non-respondents were non-white, 22% vs 14% ($p=0.0009$), with more Asians and Blacks among the non-respondents. There was no significant difference in mean age of respondents and non-respondents; however, the mean time since diagnosis (years) was slightly longer for the non-respondents (3.24 vs. 3.13, $p=0.004$).

Table 1 shows the characteristics of the 329 questionnaire respondents. The table provides this information for the total sample as well as those women who reported receiving continued follow-up care at a UC institution ($n=269$) vs. not ($n=60$). There was no significant difference in age or years since diagnosis for the 82% of respondents who continued follow-up at the UC institutions; however, those who did not continue UC follow-up were more likely to be Hispanic ethnicity. The mean time since diagnosis was 3.2 years (range 1.6 to 4.8 years). Overall 57% had stage 0–1 disease and no respondents had experienced a recurrence of the cancer. The mental component score (MCS) of the SF-12 was significantly better for those who continued UC follow-up care than those who did not (50.8 vs. 47.4, $p=0.02$), with no significant difference for the physical component score (PCS).

Follow-up Patterns According to Type of Treatment and Time Since Diagnosis

We next examined the patterns of care for the 269 women who received follow-up care at UC institutions. Women were grouped according to the type of self-reported clinical

treatment received, and were divided into surgery only (22%), surgery and radiation (33%), surgery and chemotherapy (15%), and surgery, chemotherapy and radiation therapy (31%). The demographic and medical characteristics of these four treatment groups are shown in Table 2. Women in the surgery plus chemotherapy group were significantly younger ($p < .0001$) and were significantly less likely to have stage 0 disease ($p < .0001$). Otherwise, there were no significant medical or demographic differences across the four treatment groups. However, follow-up care patterns varied significantly: the two groups who had received radiation therapy saw significantly more medical providers in follow-up ($p = .01$), with the vast majority of care occurring within a breast cancer specific office setting, and the addition of a radiation therapy office for those who received that treatment.

Number and Type of Follow-up Provider Visits

These patients reported seeing a diverse set of providers in their follow-up care at the UC institutions (those followed outside UC were not queried). The mean number of providers seen varied according to treatment group ranging from 2.0 to 2.5 ($p = .01$) as shown in Table 2. To see if there was variation in the frequency and type of providers by time since diagnosis, we looked at patients who received surgery only and compared them to who had received surgery, chemotherapy and radiation, examining those who were less than 3 years from diagnosis and those who were 3 or more years since diagnosis. The majority in both groups were being followed by an oncologist; for both treatment groups, the number of oncologist visits/year were significantly lower among those greater than three years after diagnosis (surgery only, $p = .005$; surgery, chemotherapy, radiation, $p = .01$). Still, for all providers combined, women were seeing a little over 5–6 providers/year if they were less than three years after diagnosis and 4–5 providers/year if they were three or more years after diagnosis, which was not significantly different for either treatment group.

Receipt of Treatment Summary (TS) and Survivorship Care Plan (SCP)

All survey respondents were asked “Do you have copies of your medical records which include the type of cancer you had, the treatments you received (chemotherapy, and/or radiation, and/or surgeries) to treat your cancer?” 61% responded affirmatively and this was significantly higher among those women who were having continued follow-up at a UC institution (66% vs. 41%, $p = 0.0007$). The only variable predicting the likelihood of having these records was White race ($p = .01$). The survey also asked about receipt of a TS as described earlier. 45% of women reported receiving TS, with no significant difference in receipt between those who had UC follow-up care or not (47% vs. 35%, $p = 0.10$). Variables associated with receipt of a TS included higher stage at diagnosis (stage 2–3 vs. 0–1, $p = 0.03$), and specific UC site (more likely at some than others, odds ratio 3–4 times higher at two UC sites). Among women receiving a TS, the providers most often preparing this were medical oncologists and surgeons, with infrequent preparation by a nurse practitioner or radiation oncologist. Respondents were also asked to indicate when they received the TS, which occurred at the end of active treatment in 80%, and at various times thereafter for the remainder. For those who received the TS, it was reported as “very easy” to receive by 79%. Among those who had not received a TS, 75% responded that it would be “helpful to have a written summary now.”

We also asked all patients about receipt of a SCP as defined earlier. 59% reported having received a SCP, and of those who had not, 62% reported that it would be helpful to have this information now. Variables associated with a greater likelihood of receiving a SCP included older age ($p=0.01$), and continued care at a UC institution (66% of UC vs. 41% of non-UC respondents, $p=0.004$). Although not statistically significant, there was variability in the likelihood of receipt of a SCP among the 5 UC institutions. We also examined whether patient report of having a SCP was associated with the number of visits per year or the number of providers, and found no significant relationship.

DISCUSSION

In this sample of breast cancer survivors recruited from five UC NCI-designated comprehensive cancer centers, we sought to examine the current patterns of post-treatment follow-up care. This was done as a prelude to the implementation of more systematic survivorship care coordination as part of the Athena Breast Health Program. The patient survey was also intended to complement the qualitative study that we had conducted with breast oncology providers across the five institutions.³ In that study, we had observed little provider variation in post-treatment surveillance and monitoring of breast cancer patients based on the intensity of treatment or severity of the illness. Indeed, this survey of patients confirmed the large number of post-treatment visits to multiple providers, and supported the clinicians' descriptions of the need for better coordination of care within the oncology practices. This has also been reported in other studies of breast cancer follow-up samples in other geographic regions and countries.^{11,12} Also, there was little variation in the frequency or distribution of provider visits among patients recently treated or further from diagnosis, suggesting that early post-treatment follow-up patterns persist over a long period of time.

We were interested to learn from patients the extent to which they had received either a TS or SCP, as specifically defined in this survey, which reflects the content and recommendations of the IOM report.¹ Interestingly, patients who had continued their follow-up care at a UC facility were significantly more likely to have copies of their medical records (66% vs. 41%); however, they were no more likely to have received a written treatment summary (47% vs. 35%). The SCP had been received by 59% of the respondents, and was more likely to have been received if follow-up was at a UC facility (66% at UC vs. 41% at non-UC). For both the TS and SCP, those who had not received one reported that they would like to have this information. The rate of receipt of the SCP is considerably higher than we had anticipated based on the experience of the research team in their own clinical practices, and the findings from our earlier provider survey.³ Thus, what patients may be reporting may include a variety of materials that were made available throughout their follow-up care visits, as has been reported by others.¹³ This may also reflect the characteristics of those women who chose to participate in the survey.

The high frequency of provider visits and the multiplicity of oncology providers involved in the care of these patients is concerning, given the risk for additional and unnecessary tests that may occur with each provider encounter. This is especially true in cases in which a common medical record is not completely shared. In a recent investigation at one of the UC facilities,¹⁴ we found high rates of unnecessary imaging and tumor marker evaluation in

post-treatment breast cancer survivors that was strongly associated with the specific provider managing the patient. Given that providers may differ in their adherence to post-treatment follow-up guidelines,⁵ each additional visit and unique provider may influence the pattern of visits as well as receipt of non-recommended services. However, these additional visits and tests may also provide reassurance to some patients, which may lead to their perpetuation long after they are clinically necessary in terms of detection of recurrence or for monitoring of treatment side effects. It is also notable that most of the clinical visits are with oncology specialists and relatively few are with primary care providers. We think that these excess visits are likely due to physician habit and disorganization, as well as a way to deal with patient anxiety about surveillance after breast cancer treatment ends.

An important limitation of this study was the modest response rate to the survey invitation, and the potential for bias in who responded. Because the primary purpose of this research was for quality improvement purposes within Athena, we did not pursue extensive tracking of patients who did not respond to our survey invitation. Other limitations include the cross-sectional nature of the assessment, and the substantial difference in number of patients from each institution. Nevertheless, we did not find significant differences in the patterns of follow-up care across the five institutions (i.e., type and frequency of provider visits), allowing us to combine all institutions for our analysis. We did find a difference in the frequency with which patients reported receipt of a TS, which was more frequently reported at two of the 5 UC sites; however, SCP receipt was no different across the five UC institutions. We were surprised by the high frequency with which patients reported receipt of the TS and SCP, which may be an artifact of the low response rate to the survey, revealing a bias towards more actively engaged survivors as survey respondent. However, these findings suggest ways in which the post-treatment care of breast cancer survivors could be streamlined, with greater coordination among oncology providers so that excess visits can be reduced, decreasing waste and duplication of services, while increasing the availability of providers to see newly diagnosed patients. Reducing unnecessary visits could be particularly important given the increased demand for cancer services prompted by the aging of the population,¹⁵ and the potential looming workforce shortage in oncology.¹⁶ Most of the survey respondents were receiving care with a primary care provider as well, indicating the opportunity to better coordinate and share care with these clinicians. All of these factors will be taken into consideration as the Athena Breast Health Network uses this information to implement improvements in post-treatment survivorship care across the network.

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Figure 1.
Recruitment flow chart for study including patients from all five UC institutions combined.

Table 1

Demographic and Medical Characteristics by University of California (UC) Follow-up Status

	Did not receive follow-up care at a UC N=60	Received follow-up care at a UC N=269	Whole Sample N=329	p-value ¹
Mean age (range)	58.4 (27.9–80.5)	60.9 (26.6–88.8)	60.5 (26.6–88.8)	0.12
Mean years since diagnosis (range)	3.3 (2.2–4.5)	3.2 (1.6–4.8)	3.3 (1.6–4.8)	0.46
Education				
High school or less	5 (8%)	22 (8%)	27 (8%)	.06
Some post-high school	23 (38%)	70 (26%)	93 (28%)	
College grad	21 (35%)	81 (30%)	102 (31%)	
Post-college degree	11 (18%)	96 (36%)	107 (33%)	
Hispanic				
No	49 (83%)	254 (95%)	303 (93%)	.003 ²
Yes	10 (17%)	13 (5%)	23 (7%)	
Race				
White	44 (76%)	223 (85%)	267 (83%)	.09 ³
Black	3 (5%)	10 (4%)	13 (4%)	
Native American/Alaskan Native	1 (2%)	0 (0%)	1 (<1%)	
Asian	3 (5%)	22 (8%)	25 (8%)	
Other/Mixed	7 (12%)	7 (3%)	14 (4%)	
Employment				
Employed full- or part-time	31 (52%)	136 (51%)	167 (51%)	.99
Homemaker, volunteer or student	7 (12%)	29 (11%)	36 (11%)	
Retired	18 (30%)	85 (32%)	103 (31%)	
Unemployed, disabled, or on medical leave	4 (7%)	18 (7%)	22 (7%)	
Marital Status				
Married	34 (57%)	167 (62%)	201 (61%)	.42 ⁴
Living with partner	4 (7%)	10 (4%)	14 (4%)	
Widowed	6 (10%)	23 (9%)	29 (9%)	
Divorced or separated	12 (20%)	35 (13%)	47 (14%)	
Never married	4 (7%)	33 (12%)	37 (11%)	
Yearly Household Income				
<\$30,000	6 (12%)	30 (12%)	36 (12%)	.15
\$30,000–\$60,000	15 (29%)	42 (16%)	57 (18%)	
\$60,000–\$100,000	12 (23%)	57 (22%)	69 (22%)	
>\$100,000	19 (37%)	128 (50%)	128 (48%)	
Type of Health Insurance				

	Did not receive follow-up care at a UC N=60	Received follow-up care at a UC N=269	Whole Sample N=329	p-value ¹
None	1 (2%)	3 (1%)	4 (1%)	.24 ⁵
Private	38 (64%)	164 (61%)	202 (62%)	
Medicare	16 (27%)	93 (35%)	109 (33%)	
Medicaid or other public	4 (7%)	8 (3%)	8 (4%)	
UC Institution				.39
Davis	17 (28%)	57 (21%)	74 (22%)	
Irvine	6 (10%)	25 (9%)	31 (9%)	
Los Angeles	18 (30%)	70 (26%)	88 (27%)	
San Diego	3 (5%)	33 (12%)	36 (11%)	
San Francisco	16 (27%)	84 (31%)	100 (30%)	
Stage at diagnosis ⁷				.09
0	5 (8%)	31 (12%)	36 (11%)	
1	29 (48%)	122 (45%)	151 (46%)	
2	13 (22%)	86 (32%)	99 (30%)	
3	13 (22%)	30 (11%)	43 (13%)	
Treatment group				.90
Surgery only	11 (18%)	58 (22%)	69 (21%)	
Surgery and radiation	20 (33%)	88 (33%)	108 (33%)	
Surgery and chemotherapy	8 (13%)	40 (15%)	48 (15%)	
Surgery, chemotherapy & radiation	21 (35%)	83 (31%)	104 (32%)	
Additional cancer or recurrence since diagnosis				.98
No	53 (91%)	240 (91%)	293 (91%)	
Yes	5 (9%)	23 (9%)	28 (9%)	
Mean scores (range) from SF-12				.02
PCS (physical component scale)	46.7 (21.1–63.5)	47.3 (16.0–66.9)	47.2 (16.0–66.9)	
MCS (mental component scale)	47.4 (19.8–64.8)	50.8 (18.1–68.7)	50.2 (18.1–68.7)	

Abbreviations: PCS=physical component scale; MCS=mental component scale

¹P-values for continuous variables are from t-tests and for categorical variables are from chi-square tests, except where noted

²P-value is from Fisher's exact test, due to small expected counts in cells

³P-value is comparing white to non-white

⁴P-value is comparing married to non-married

⁵P-value is comparing private, Medicare, and Medicaid or other public (it excludes those with no health insurance, due to small numbers)

⁶P-values for continuous variables are from t-tests and for categorical variables are from chi-square tests

⁷Missing data from 4 subjects from UC Davis

Table 2

Demographic and Medical Characteristics by Type of Breast Cancer Treatment for Those Receiving Follow-up Care at a UC (N=269)

	Surgery only N=58	Surgery + Radiation N=88	Surgery + Chemo N=40	Surgery + Chemo + Radiation N=83	p-value ^f
Mean age (range)	61.5 (27.8–86.4)	64.0 (35.2–88.8)	54.4 (26.6–76.8)	60.4 (32.2–80.8)	<.0001
Mean years since diagnosis (range)	3.2 (2.1–4.8)	3.3 (2.3–4.4)	3.3 (2.3–4.5)	3.2 (1.6–4.8)	.87
Education					
High school or less	4 (7%)	9 (10%)	6 (15%)	3 (4%)	.36
Some post-high school	15 (26%)	24 (27%)	10 (25%)	21 (25%)	
College grad	22 (38%)	27 (31%)	8 (20%)	24 (29%)	
Post-college degree	17 (29%)	28 (32%)	16 (40%)	35 (42%)	
Hispanic					
No	57 (98%)	82 (94%)	37 (92.5%)	78 (95%)	.58
Yes	1 (2%)	5 (6%)	3 (7.5%)	4 (5%)	
Race					
White	48 (84%)	70 (81%)	34 (92%)	71 (87%)	.48 ²
Black	2 (4%)	3 (3.5%)	1 (3%)	4 (5%)	
Asian	7 (12%)	9 (10.5%)	2 (5%)	4 (5%)	
Other/Mixed	0 (0%)	4 (5%)	0 (0%)	3 (4%)	
Employment					
Employed full- or part-time	30 (51%)	35 (40%)	26 (65%)	45 (54%)	.24
Homemaker, volunteer or student	6 (10%)	9 (10%)	5 (12.5%)	9 (11%)	
Retired	20 (34%)	35 (40%)	6 (15%)	24 (29%)	
Unemployed, disabled, or on medical leave	2 (3%)	8 (9%)	3 (7.5%)	5 (6%)	
Marital Status					
Married	38 (66%)	50 (57%)	29 (72.5%)	50 (60%)	.39 ³
Living with partner	0 (0%)	5 (6%)	2 (5%)	3 (4%)	
Widowed	6 (10%)	8 (9%)	3 (7.5%)	6 (7%)	

	Surgery only N=88	Surgery + Radiation N=88	Surgery + Chemo N=40	Surgery + Chemo + Radiation N=83	p-value [†]
Divorced or separated	7 (12%)	11 (13%)	3 (7.5%)	14 (17%)	
Never married	7 (12%)	13 (15%)	3 (7.5%)	10 (12%)	
Yearly Household Income					
<\$30,000	8 (14%)	11 (13%)	5 (13%)	6 (7.5%)	.28
\$30,000–\$60,000	7 (13%)	18 (22%)	7 (18%)	10 (12.5%)	
\$60,000–\$100,000	11 (20%)	20 (24%)	4 (10%)	22 (27.5%)	
>\$100,000	30 (54%)	33 (40%)	23 (59%)	42 (52.5%)	
Type of Health Insurance					
None	1 (2%)	2 (2%)	0 (0%)	0 (0%)	.07
Private	30 (53%)	46 (52%)	31 (77.5%)	57 (69%)	
Medicare	23 (40%)	36 (41%)	9 (22.5%)	25 (30%)	
Medicaid or other public	3 (5%)	4 (5%)	0 (0%)	1 (1%)	
UC Institution					
Davis	13 (22%)	25 (28%)	4 (10%)	15 (18%)	.03
Irvine	9 (16%)	8 (9%)	6 (15%)	2 (2%)	
Los Angeles	15 (26%)	20 (23%)	7 (17.5%)	28 (34%)	
San Diego	3 (5%)	13 (15%)	5 (12.5%)	12 (14%)	
San Francisco	18 (31%)	22 (25%)	18 (45%)	26 (31%)	
Stage at diagnosis					
0	15 (26%)	15 (17%)	0 (0%)	1 (1%)	<.0001
1	30 (52%)	56 (63%)	16 (41%)	20 (24%)	
2	12 (21%)	16 (18%)	19 (46%)	39 (47%)	
3	1 (2%)	1 (1%)	5 (13%)	23 (28%)	
Additional cancer or recurrence since diagnosis					
No	52 (93%)	77 (88.5%)	36 (90%)	75 (94%)	.64
Yes	4 (7%)	10 (11.5%)	4 (10%)	5 (6%)	
Mean scores (range) from SF-12					

	Surgery only N=58	Surgery + Radiation N=88	Surgery + Chemo N=40	Surgery + Chemo + Radiation N=83	p-value ¹
PCS (physical component scale)	47.3 (16.6–63.2)	48.5 (19.6–63.8)	49.2 (28.7–58.8)	45.2 (16.0–66.9)	.15
MCS (mental component scale)	51.5 (31.9–64.6)	50.6 (21.7–68.7)	51.6 (38.1–64.9)	50.2 (18.1–63.6)	.81
Mean number of providers seen	2.1 (1–5)	2.4 (1–5)	2.0 (1–4)	2.5 (1–5)	.01
Percent receiving follow-up care at each office:					
Breast-specific office	46 (79%)	62 (70%)	37 (93%)	74 (89%)	.003
Surgical office	17 (29%)	37 (42%)	8 (20%)	32 (39%)	.07
Radiation office	2 ⁴ (3%)	35 (40%)	0 (0%)	23 (28%)	<.0001
Primary health office	15 (26%)	25 (28%)	8 (20%)	25 (30%)	.68
Some other office	11 (19%)	16 (18%)	5 (13%)	13 (16%)	.82

Abbreviations: PCS=physical component scale; MCS=mental component scale

¹ P-values reflect the results of ANOVA for continuous variables and chi-square tests for categorical variables, except when expected counts are too low, in which case the Fisher Exact test is used instead (for variables Hispanic, Type of Health Insurance, and Recurrence)

² P-value is for white vs. non-white

³ P-value is for married vs. not married

⁴ We suspect these visits may have been for a radiation consultation