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ORIGINAL REPORT

Breast Cancer Adjuvant Chemotherapy Decisions in Older Women: The Role of Patient Preference and Interactions With Physicians

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ABSTRACT

Purpose
Breast cancer chemotherapy decisions in patients ≥ 65 years old (older) are complex because of comorbidity, toxicity, and limited data on patient preference. We examined relationships between preferences and chemotherapy use.

Methods
Older women (n = 934) diagnosed with invasive (≥ 1 cm), nonmetastatic breast cancer from 2004 to 2008 were recruited from 53 cooperative group sites. Data were collected from patient interviews (87% complete), physician survey (93% complete), and charts. Logistic regression and multiple imputation methods were used to assess associations between chemotherapy and independent variables. Chemotherapy use was also evaluated according to the following two groups: indicated (estrogen receptor [ER] negative and/or node positive) and possibly indicated (ER positive and node negative).

Results
Mean patient age was 73 years (range, 65 to 100 years). Unadjusted chemotherapy rates were 69% in the indicated group and 16% in the possibly indicated group. Women who would choose chemotherapy for an increase in survival of ≤ 12 months had 3.9 times (95% CI, 2.4 to 6.3 times; $P < .001$) higher odds of receiving chemotherapy than women with lower preferences, controlling for covariates. Stronger preferences were seen when chemotherapy could be indicated (odds ratio [OR] = 7.7; 95% CI, 3.8 to 16; $P < .001$) than when treatment might be possibly indicated (OR = 1.9; 95% CI, 1.0 to 3.8; $P = .06$). Higher patient rating of provider communication was also related to chemotherapy use in the possibly indicated group (OR = 1.9 per 5-point increase in communication score; 95% CI, 1.4 to 2.8; $P < .001$) but not in the indicated group ($P = .15$).

Conclusion
Older women's preferences and communication with providers are important correlates of chemotherapy use, especially when benefits are more equivocal.

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INTRODUCTION

Systemic adjuvant chemotherapy is currently recommended for many patients with breast cancer,[1] but women age ≥ 65 years (referred to as older here) are less likely to receive chemotherapy than younger women.[2-7] This pattern likely reflects the complexity of chemotherapy decision making in older women as the result of a paucity of clinical trial data on efficacy, perceptions of increased toxicity risk,[8-14] more favorable tumor characteristics,[15] high rates of comorbidities that can interact with treatment,[16,17] and decreases in ability to tolerate treatment related to aging processes.[18]

In situations where the risks and benefits of chemotherapy are equivocal, patient preferences,[19-22] physician attitudes,[23,24] age biases,[6,25] and patient-physician communication[26,27] are important in decision making. In this article, we use data from a prospective cohort of older women treated for their breast cancer outside of treatment trials but in a cooperative group setting to examine the associations between patient, clinical, and physician factors in chemotherapy use. We hypothesized that the odds of receiving chemotherapy would be higher for

older women with stronger preferences for chemotherapy than for women with lower preferences, controlling for other factors. We also hypothesized that women who reported greater patient-physician communication about treatment would be more likely to receive chemotherapy than women reporting less communication.

METHODS

The study was conducted at 53 Cancer and Leukemia Group B (CALGB) sites. The protocol met Health Insurance Portability and Accountability Act standards and was approved by the CALGB, the National Cancer Institute, and all institutional review boards.

Setting and Population

We report on older women who were newly diagnosed with breast cancer between January 1, 2004 and March 31, 2008; accrual is ongoing for investigation of follow-up care. Eligible participants were ≥ 65 years old, were diagnosed with invasive nonmetastatic breast cancer (tumors ≥ 1 cm), spoke English or Spanish, had sufficient cognitive function to complete interviews, and were within 20 weeks of their last definitive surgery. In some sites, a treatment trial targeting older women was open for enrollment[28]; women who enrolled onto that trial were not eligible.

Clinical research associates ascertained patients, confirmed eligibility, approached physicians for permission to contact patients (obtained for 95% of women), and obtained consent. Patient registration was managed by the CALGB Statistical Center. Among consenting patients registered to the study (n = 994), 6.0% (n = 60) were ineligible as a result of cognitive impairment (based on scores of ≥ 11 on the Blessed Orientation-Memory-Concentration test)[29,30] or other reasons (Fig 1). Among the remaining 934 eligible women, 87% (n = 814) completed baseline interviews; the final data set includes 801 women. Women who completed interviews were not significantly different from those who did not regarding age, tumor size, and receptor status, except that women who could not be contacted or refused were more likely to be nonwhite than women who completed interviews (19% *v* 11%, respectively).

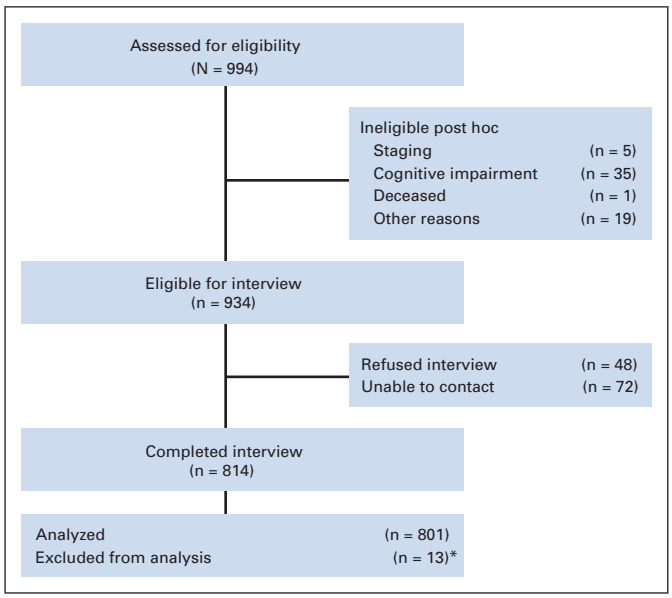

Fig 1. Sampling frame for older women with newly diagnosed breast cancer. Flow chart of patient status. Women were registered to the study. Registered women completed interviews, refused, could not be contacted, were found to be ineligible (eg, as a result of cognitive screen failures or being outside of stage criteria), or were lost for administrative reasons. (*) Among the 814 women interviewed, nine had missing data as a result of a computer failure, and four had missing information on chemotherapy status, so that 801 women are included in the final data set. Other reasons for ineligibility included having recurrent cancer or another primary cancer or being beyond 20 weeks of last definitive surgery.

Data Collection

Patient interviews were completed on the telephone by centralized staff and lasted 45 minutes; 0.1% of interviews were in Spanish. Ten percent of interviews were observed for quality assurance purposes. Women were interviewed within an average of 4 weeks of registration and 17 weeks from diagnosis.

Physicians were mailed a brief 15-minute survey of their background and practice styles. If a woman saw a medical oncologist, this provider was selected to receive the survey; if not, we surveyed the surgeon. The 801 patients had 194 physicians, and 180 physicians (93%) completed a survey. Records were abstracted by clinical research associates.

Outcome Variables

The primary outcome was chemotherapy receipt (yes *v* no), including use of neoadjuvant treatment. Use of chemotherapy was ascertained via patient self-report and records (97.5% concordance $\kappa = .95$); final assignment for the few discordant results was based on records.

We defined the following clinical subgroups of women based on practice guidelines[1]: chemotherapy indicated (any positive nodes and/or estrogen receptor [ER] negative) and chemotherapy possibly indicated (node negative and ER positive). We also examined results using a more stringent definition of indicated as requiring ≥ four positive nodes. We did not have data on human epidermal growth factor receptor 2 status or results of gene expression profiling because these were not used until the end of the study period.[31,32]

Independent Variables

The key independent variables were patient preference and patient-physician communication. To measure preferences, we used a modified time trade-off approach[33,34] to evaluate the amount of benefit women would require to choose chemotherapy in a hypothetical situation. Using a ping-pong response pattern, women were asked the following question: "If you were this…patient, would you agree to chemotherapy if it has a 50/50 chance of adding (5 years…down to one week) to your life?" Choosing chemotherapy for the shortest period of gain (ie, 1 week) indicates the highest preference for chemotherapy, whereas not choosing chemotherapy for even a 5-year gain represents the lowest preference. Because 45% of women indicated that they would choose chemotherapy if it provided ≤ 12 months of life extension, we dichotomized preferences at this threshold.

Perceptions of patient-physician communication were measured using items developed by Makoul et al.[35] The seven-item scale includes statements such as, "The doctor fully explained the risks of the treatment recommended" and "The doctor gave me all the information I needed for decisions about my health problem" ($\alpha = .79$). To evaluate attitudes toward chemotherapy, we used 4-point Likert-scale responses to the following two questions: "You are less likely to have the cancer come back if you have chemotherapy" and "The adverse effects are worse than the disease."

Among the subset of women who saw a medical or surgical oncologist and reported that chemotherapy was discussed with them, we ascertained whether they were accompanied by another person when chemotherapy was discussed. We included physicians' attitudes toward patient participation in chemotherapy decisions using a previously validated 11-item instrument ($\alpha = .84$).[36,37] In addition, we evaluated decision-making preferences.[35]

Clinical Variables

Pathologic staging was used to classify tumor size and nodal status. Chemotherapy rates were 24% in women who were node negative and increased to 68%, 56%, 71%, 75%, and more than 88% for women who had one, two, three, four, and ≥ five positive nodes, respectively. Thus, we dichotomized nodal status into positive versus negative for primary analysis. Surgery included mastectomy or breast conservation. Hormone status was measured using ER status. The Older Americans Resources and Services Multidimensional Functional Assessment 16-item physical health scale was used to assess comorbidity.[38] Women were dichotomized into the following two groups: those having ≤ two versus those with more than two diseases. Activities of daily living were measured using the Older Americans Resources and Services

Table 1. Demographic and Clinical Characteristics of Older Patients With Breast Cancer by Chemotherapy Use and Provider Factors

Characteristic	Total		Missing Data		Chemotherapy Use*				*P*
					Yes (n = 332)		No (n = 469)		
	No. of Patients	%	No. of Patients	%	No. of Patients	%	No. of Patients	%	
Patient factors									
Age, years			0	0					< .001
Mean	73				71		75		
Standard deviation	6.1				5.1		6.2		
65-74	518	65			265	51	253	49	< .001
75-79	164	20			48	29	116	71	
80+	119	15			19	16	100	84	
Race			0	0					.05
White	698	87			280	40	418	60	
Nonwhite	103	13			52	51	51	49	
Current marital status			7	1					.02
Married or living as married	417	53			189	45	228	55	
Other	377	47			141	37	236	63	
Highest level of education			32	4					.40
Less than HS (≤ 12 years)	345	45			147	43	198	57	
HS graduate or higher (> 12 years)	424	55			168	40	256	60	
Insurance			0	0					.15
Medicaid	61	8			32	53	29	47	
Private	616	77			246	40	370	60	
Medicare Only	124	15			54	44	70	56	
Preference			39	5					< .001
Low (> 12-month gain)	417	55			116	28	301	72	
High (≤ 12-month gain)	345	45			211	61	134	39	
Attitude: less likely to have the cancer come back if you have chemotherapy			140	17					< .001
Very much	243	37			174	72	69	28	
Somewhat	245	37			100	41	145	59	
Very little	59	9			12	22	47	80	
Not at all	114	17			27	24	87	76	
Attitude: adverse effects of chemotherapy are worse than the disease			137	17					< .001
Not at all	203	30			128	63	75	37	
Very little	134	20			79	59	55	41	
Somewhat	223	34			72	32	151	68	
Very much	104	16			27	26	77	74	
Provider factors									
Years since medical school graduation (to 2007)	21	8.1	31	4	20	8.1	21	8.0	.02
Provider sex			0	0					.14
Female	371	46			164	44	207	56	
Male	430	54			168	39	262	61	
Patient-provider interactions									
Perceptions of patient-provider communication, score†			95	12					< .001
Mean	30				31		28		
Standard deviation	5.0				4.9		4.8		
Saw a medical oncologist			15	2					.09
Yes	747	95			314	42	433	58	
No	39	5			11	28	28	72	
Clinical factors									
Tumor size, cm			1	0.1					< .001
< 2 cm (T1)	460	58			145	32	315	69	
2 to < 3 cm (T2)	195	24			92	47	103	53	
≥ 3 cm (T3)	145	18			94	64	51	35	
Nodal status			0	0					< .001
Positive	300	37			214	71	86	29	
Negative	501	63			118	24	383	76	

(continued on following page)

Table 1. Demographic and Clinical Characteristics of Older Patients With Breast Cancer by Chemotherapy Use and Provider Factors (continued)

Characteristic	Total		Missing Data		Chemotherapy Use*				
					Yes (n = 332)		No (n = 469)		
	No. of Patients	%	No. of Patients	%	No. of Patients	%	No. of Patients	%	*P*
Estrogen receptor status			2	0.2					< .001
Negative	141	18			108	79	33	29	
Positive	658	82			223	34	383	76	
Clinical indications			2	0.2					< .001
Indicated	379	47			263	69	116	31	
Possibly indicated	420	53			68	16	352	84	
Most extensive primary surgery			3	0.4					< .001
Mastectomy	248	31			135	54	113	46	
Breast conservation	550	69			196	36	354	64	
Comorbidity score (OARS)			1	0.1					< .001
0-2	348	43			170	49	178	51	
> 2	452	57			161	36	291	64	
Cognitive function score (Blessed test)			0	0					.12
Perfect score	389	49			172	44	217	56	
≥ 1 error	412	51			160	39	252	61	
Physical function (PCS)‡			59	7					.01
Mean	52				52		51		
Standard deviation	7.1				6.8		7.3		
Setting of care									
HMO			53	7					.24
Yes	130	17			59	45	71	55	
No	618	83			246	40	372	60	
NCI-designated cancer center			0	0					.07
Yes	254	32			117	46	137	54	
No	547	68			215	39	332	61	
No. of patients per site			0	0					.001
Mean	57				65		51		
Standard deviation	56				64		50		

NOTE. All variables were used in multiple imputations together with living situation, caretaker, home ownership, religious/spiritual help, decision-making style, Medical Outcomes Study emotional and tangible support, physician attitude toward patient participation, axillary dissection, impairment in activities of daily living function, months from diagnosis to interview, year of diagnosis, region, and chemotherapy use.

Abbreviations: HS, high school; OARS, Older Americans Resources and Services; PCS, physical component score; HMO, health maintenance organization; NCI, National Cancer Institute.

*Chemotherapy was defined as any systemic regimen, including neoadjuvant and adjuvant therapies, based on responses to baseline and 6-month interview. Indicated chemotherapy includes women with any positive nodes and/or those with estrogen receptor–negative tumors; possibly indicated chemotherapy includes all other women. Only 11 women (1.4%) were enrolled onto a clinical treatment trial.

†Perceptions of communication score ranges from 7 to 42, with higher scores representing perceptions of best communication.

‡PCS ranges from 0 to 100, with higher scores representing better physical function.

Instrumental Activities of Daily Living scale[39] and categorized into no limitations versus ≥ one limitation. Functional status was based on the physical components score from the Medical Outcomes Study Short Form-12.[39] Cognition was dichotomized as no impairment (score of 0) versus very mild impairment (score of 1 to 10) based on score distribution; patients with scores ≥11 were excluded.

Controlling Variables

We considered several patient sociodemographic and other factors as potential confounders of the relationships between preferences and/or communication and chemotherapy use. Race/ethnicity was based on self-report and categorized as white and nonwhite. Other demographic variables included age, education (< or ≥ high school), and insurance.

We used two subscales of the Medical Outcomes Study social support instrument to measure perceived availability of emotional/informational support and tangible support.[40] Marital status (currently *v* not married) was another indicator of social support.

Because the timing of the interview could have affected responses, we controlled for the time from diagnosis to the interview. We also controlled for health maintenance organization versus non–health maintenance organization care, National Cancer Institute–designated cancer center versus other, and geographic region. Physician sex and time since medical school graduation were included. Finally, we controlled for the year of diagnosis.

Statistical Analysis

We evaluated the associations between chemotherapy use and study variables using *t* tests and χ^2 tests. Next, we used multiple imputation methods to impute values for missing data; most variables were missing up to 5% of values, and only two variables had 17% missing values (Table 1). IVEware (University of Michigan, Ann Arbor, MI) was used to generate 10 imputed data sets using variables from the data set.[41]

We used logistic regression to model chemotherapy use. Variable selection was based on the significance ($P = .05$ level) of univariate associations with chemotherapy; variables that were not significant in the final model were removed. However, factors included in a priori hypotheses or having face validity (eg, race, region) were retained even if not significant. The estimates from the logistic regression models corresponding to the 10 imputed data sets were combined according to the method of Rubin.[42] We also used logistic regression models with generalized estimating equations to account for the potential clustering of chemotherapy use by accrual site or by physician.

Table 2. Rates of Chemotherapy Use in Older Women by Clinical Subgroup

Chemotherapy Use	Chemotherapy Possibly Indicated (n = 420) ER Positive, Node Negative	Chemotherapy Indicated (n = 379)*		
		ER Positive, Node Positive	ER Negative	
			Node Negative	Node Positive
No. of patients	420	238	79	62
Received chemotherapy, %	16	65	63	94
95% CI	13 to 20	59 to 71	52 to 72	91 to 97

NOTE. Chemotherapy was defined as any systemic regimen, including neoadjuvant and adjuvant therapies, based on medical record audits at registration and the 6-month follow-up. Two women are excluded as a result of missing hormonal receptor status. Among the 318 women who received chemotherapy and had available chemotherapy dates, 16 (5%) received this modality as neoadjuvant treatment. The unadjusted overall rate of chemotherapy was 42% (95% CI, 38% to 45%).

Abbreviation: ER, estrogen receptor.

*The unadjusted overall rate of chemotherapy for the three subgroups of the indicated group was 69% (95% CI, 65% to 74%).

Because the results were similar, we report only the results from the logistic regression models. We also constructed regression models among the subset of women with complete data for all variables. The results were similar, so we report the imputation-based results. Last, we tested for possible interactions between the main predictors and strength of indications for chemotherapy. Because interactions were present, we conducted stratified analyses by whether chemotherapy was indicated or possibly indicated. We report C statistics for the logistic regression models; pseudo-R^2 values were also calculated to estimate the percentage of variance in chemotherapy use explained by the models.

RESULTS

Use of chemotherapy was significantly associated with several patient, clinical, and provider factors in univariate analyses (Table 1). On the basis of hormone receptor and nodal status, chemotherapy was indicated for 47% and was possibly indicated for 53% of the cohort. Unadjusted chemotherapy rates were 69% (95% CI, 65% to 74%) in the indicated group and 16% (95% CI, 13% to 20%) in the possibly indicated group, for an overall rate of 42% (Table 2).

In the regression model, tumor factors (ie, tumor size, nodal status, and ER status) were strongly associated with chemotherapy use. Preferences were also significantly associated with chemotherapy (Table 3). Women who would choose chemotherapy for an increase in survival of ≤ 12 months (high preference) were 3.9 times (95% CI, 2.4 to 6.3 times; $P < .001$) more likely to receive chemotherapy than women who would only choose chemotherapy if it added more than 12 months (low preference), controlling for covariates. Ratings of patient-physician communication were also related to chemotherapy, with women who rated communication most highly having higher odds of receiving chemotherapy than women who rated communication less favorably (odds ratio [OR] = 1.6 per 5-point increase in communication score; 95% CI, 1.2 to 2.0; $P < .001$). Younger patient age was also significantly associated with chemotherapy use. Overall, the variables included explained 68% of the variance in chemotherapy use; the majority of explained variance was accounted for by tumor factors (41%); 12% was explained by age, and 4% was explained by communication and preferences. When we considered women separately by clinical indications for chemotherapy, the effects of age and other variables were similar across the two groups. However, we saw higher associations between high (*v* low) preferences and chemotherapy among women with indications for chemotherapy (OR = 7.7; 95% CI, 3.8 to 16; $P < .001$) than among women in whom it was possibly indicated (OR = 1.9; 95% CI, 1.0 to 3.8; $P = .06$; Table 3; *P* for interaction = .004). Also, higher patient rating of communication was related to chemotherapy use among the possibly indicated group (OR = 1.9; 95% CI, 1.4 to 2.8; $P < .001$) but not among the indicated

Table 3. Adjusted Odds of Receiving Chemotherapy in Older Women With Breast Cancer

Factor	Overall (N = 799)			Chemotherapy Indicated (n = 379)			Chemotherapy Possibly Indicated (n = 420)		
	OR	95% CI	*P*	OR	95% CI	*P*	OR	95% CI	*P*
Preference: ≤ *v* > 12 months	3.9	2.4 to 6.3	< .001	7.7	3.8 to 16	< .001	1.9	0.97 to 3.8	.06
Communication score: 5-point increase	1.6	1.2 to 2.0	< .001	1.3	0.9 to 1.9	.15	1.9	1.4 to 2.8	< .001
You are less likely to have the cancer come back if you have chemotherapy: agree *v* disagree	5.4	2.9 to 10	< .001	5.7	2.5 to 13	< .001	4.8	1.8 to 13	.002
The adverse effects are worse than the disease: agree *v* disagree	0.3	0.2 to 0.5	< .001	0.2	0.1 to 0.5	< .001	0.3	0.2 to 0.7	.003
Tumor size									
2-2.9 *v* < 2 cm	2.4	1.4 to 4.1	.002	1.8	0.8 to 4.0	.13	3.2	1.5 to 6.9	.003
≥ 3 *v* < 2 cm	3.5	1.8 to 6.7	< .001	4.5	1.9 to 11	.001	2.5	0.9 to 7.2	.09
Nodal status: positive *v* negative	17	9.7 to 28	< .001						
ER status: positive *v* negative	0.1	0.1 to 0.3	< .001						
OARS: > 2 *v* 0-2	0.7	0.5 to 1.1	.16	0.8	0.4 to 1.6	.61	0.7	0.4 to 1.3	.27
Surgery: mastectomy *v* conservation	1.9	1.1 to 3.2	.01	3.7	1.7 to 8.0	.001	0.9	0.4 to 2.0	.84
Cognitive function: ≥ 1 error *v* perfect score	0.9	0.6 to 1.4	.64	0.9	0.5 to 1.8	.80	0.9	0.5 to 1.8	.80
Age: 5-year increase	0.5	0.4 to 0.6	< .001	0.4	0.3 to 0.6	< .001	0.5	0.4 to 0.7	< .001

NOTE. Controlling for race, time from diagnosis to interview, diagnosis year, region, and years from provider medical school graduation in the table was performed using logistic regression models. Results are based on 10 multiple imputed data sets. Chemotherapy was defined as any systemic regimen, including neoadjuvant therapy, based on medical records. Indicated includes women with any positive nodes and/or those with ER-negative tumors; possibly indicated includes all other women. Two women missing ER status are excluded. Women (n = 40, 4.9%) who gave "unsure" as a response for preferences were coded as missing. Results including these women and imputing their results or excluding them were similar, so they were included in final models.

Abbreviations: OR, odds ratio; ER, estrogen receptor; OARS, Older Americans Resources and Services.

group (OR = 1.3; 95% CI, 0.9 to 1.9; $P = .15$), although this was not statistically significant (P for interaction = .12). These relationships were qualitatively similar when we defined indicated as having four or more nodes among ER-positive women. However, the OR for preferences was of greater magnitude in the possibly indicated group of women (< four nodes or node negative) than before (node negative), suggesting that as the choice became more equivocal, utilities played more of a role in chemotherapy use (data not shown).

Among the subset of 509 women who stated that they saw an oncologist and discussed chemotherapy, 67% who had a companion accompany them received chemotherapy compared with 45% who were not accompanied. In multivariable analysis, the odds of chemotherapy were 2.1 times higher (95% CI, 1.2 to 3.7 times; $P = .01$) among women who were accompanied (*v* not) after adjusting for age, clinical factors, comorbidity, and cognition.

DISCUSSION

In this cohort of older breast cancer patients, we demonstrate that chemotherapy use varies by clinical indications and confirmed that age is associated with decreasing chemotherapy use.[2,3,5] We also find that having a stronger preference for chemotherapy is associated with greater odds of receiving chemotherapy. Furthermore, we observe that when chemotherapy indications are less strong, higher ratings of physician-patient communication are an important determinant of use. Of interest, we also found that patients who were accompanied to visits were more likely to receive chemotherapy than those attending alone.

In this study, 42% of women received chemotherapy, a rate that is higher than what is observed in the Surveillance, Epidemiology, and End Results–Medicare data set; Du and Goodwin[2] reported rates of chemotherapy in older patients with breast cancer of approximately 11% in the early 1990s, and rates have been increasing over time in this age group.[43-45] However, within clinical subgroups, our rates are more similar to prior reports. For instance, we found a 16% rate among women with node-negative, ER-positive tumors, which is greater than the 5% rate reported by Du Du and Goodwin[2] for similar patients diagnosed a decade earlier. Higher chemotherapy rates were found by us and others in women with nodal involvement or negative hormone receptors.[2,43]

The observation that patient preferences are more strongly associated with chemotherapy among older women with the greatest indications also suggests that older women are appropriately judging the benefit-to-risk ratio of chemotherapy. This is similar to the findings of Zimmermann et al,[46] who found that chemotherapy preferences increase as the benefits presented increase. The preference cut point of $\leq$ 12 months of gain from chemotherapy in our sample corresponds to the expected benefit based on extrapolation of clinical trials.[8] In a review conducted by Duric and Stockler,[47] this same cut point was considered sufficient to undergo chemotherapy by 74% of women. In several other studies, older breast cancer patients are willing to select chemotherapy with major toxicity for similar increases in life expectancy.[34,48-51] The strength of the physician recommendation has been found to be a determinant of the strength of patients' preferences for chemotherapy.[19] Taken together, these results suggest that women's preferences reflect a good understanding of their disease as conveyed by their physicians.

In situations where chemotherapy could be possibly indicated, women reporting greater communication are more likely to undergo chemotherapy than women reporting less communication. However, we do not know the content of actual communication about treatment. Follow-up research using transcripts of encounters could be used to understand this result more fully. In other settings, good communication is associated with higher satisfaction with care and treatment choices and better quality of life.[27,52]

In our study, it appears that women who had a companion present during consultations were more likely to receive chemotherapy. This result was unexpected and may be related to several factors, including the influence of family on decisions, the presence of social support, help in recording and processing information, greater need for concrete support related to disease severity, or the influence of a third person on the interaction. Several investigators have noted that companions affect the dynamic of medical encounters by facilitating communication, asking clarifying questions, and bridging barriers.[53-55] In other research, Wolff and Roter[56] found that older individuals who were accompanied to visits were older and sicker than those attending alone. In an Italian study with older patients receiving chemotherapy, 79% indicated that they desired having a family member present during consultations.[57] Thus, there are several alternative explanations for our result. This will be an important area for additional research. In the interim, our results suggest that there may be several routes for improving communication, including the presence of a third person or providing a written or audiotape summary of the visit.

There are several caveats that should be considered in evaluating our results. Although the study was designed to measure preferences before oncology consultations, this was not always feasible given the large number of sites and variable staffing. Our results suggest that preferences were based on realistic appraisals of risks and benefits. However, we cannot rule out the possibility that actual treatment affected ratings of preference.[58,59]

We analyzed results by level of clinical indication for chemotherapy based on the data we had available. We recognize that more refined measures of recurrence risk have recently come into practice (eg, Oncotype DX, Genomic Health, Redwood City, CA; MammaPrint, Agendia, Huntington Beach, CA)[31,60] and that we did not have data on tumor grade or human epidermal growth factor receptor 2 status. We also did not have data on actual treatment recommendation by clinicians, including whether physicians judged chemotherapy to be indicated or possibly indicated for a particular patient.

This cohort includes women treated for their cancer in settings that participate in cooperative trial research. Our sample had a greater proportion of poor prognosis tumors than older women in the general population, suggesting referral bias. Also, nearly all women in the study reported seeing an oncologist, reflecting either the institutional culture or how patients were ascertained. Seeing an oncologist is a strong predictor of treatment.[61] These factors limit the external generalizability of our results, although internal comparisons are valid. Finally, although the racial/ethnic breakdown of the sample is representative of older patients seen at participating sites and their proportions in the older US breast cancer population,[62] the absolute number of minorities is too small for separate analysis. It will be important to enhance minority recruitment in our ongoing accrual efforts.

This is one of the largest primary observational data sets of older women to examine determinants of chemotherapy use in the United

States.[63] The detailed data available may help explain some of the patterns of care observed in secondary data sets such as the Surveillance, Epidemiology, and End Results–Medicare data set. This study indicates that older women's preferences and communication with providers are important correlates of chemotherapy use, especially when benefits are more equivocal. These results suggest that physicians can enhance the care of the growing population of older patients with breast cancer through assessment of and communication about chemotherapy risks and benefits and consideration of women's preferences.[17,26,64-66]

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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