

Community Oncologists' Decision-Making for Treatment of Older Patients With Cancer

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Abstract

Background: This study's objectives were to describe community oncologists' beliefs about and confidence with geriatric care and to determine whether geriatric-relevant information influences cancer treatment decisions. **Methods:** Community oncologists were recruited to participate in 2 multisite geriatric oncology trials. Participants shared their beliefs about and confidence in caring for older adults. They were also asked to make a first-line chemotherapy recommendation (combination vs single-agent vs no chemotherapy) for a hypothetical vignette of an older patient with advanced pancreatic cancer. Each oncologist received one randomly chosen vignette that varied on 3 variables: age (72/84 years), impaired function (yes/no), and cognitive impairment (yes/no). Other patient characteristics were held constant. Logistic regression models were used to identify associations between oncologist/vignette-patient characteristics and treatment decisions. **Results:** Oncologist response rate was 61% (n=305/498). Most oncologists agreed that "the care of older adults with cancer needs to be improved" (89%) and that "geriatrics training is essential" (72%). However, <25% were "very confident" in recognizing dementia or conducting a fall risk or functional assessment, and only 23% reported using the geriatric assessment in clinic. Each randomly varied patient characteristic was independently associated with the decision to treat: younger age (adjusted odds ratio [aOR], 5.01; 95% CI, 2.73–9.20), normal cognition (aOR, 5.42; 95% CI, 3.01–9.76), and being functionally intact (aOR, 3.85; 95% CI, 2.12–7.00). Accounting for all vignettes across all scenarios, 161 oncologists (52%) said they would offer chemotherapy. All variables were independently associated with prescribing single-agent over combination chemotherapy (older age: aOR, 3.22; 95% CI 1.43–7.25, impaired cognition: aOR, 3.13; 95% CI, 1.36–7.20, impaired function: aOR, 2.48; 95% CI, 1.12–5.72). Oncologists' characteristics were not associated with decisions about providing chemotherapy. **Conclusion:** Geriatric-relevant information, when available, strongly influences community oncologists' treatment decisions.

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Mohile et al

As the baby boomer generation in the United States ages, the number of older patients with cancer is increasing. A 67% increase in cancer incidence is projected in those individuals aged ≥ 65 years, compared with an 11% increase among younger adults.^{1,2} Older patients with cancer have a higher prevalence of comorbidities, geriatric syndromes, and disabilities than younger patients and older patients without cancer.^{3,4} Older patients with conditions other than cancer also carry a high risk of developing significant chemotherapy toxicity, functional and cognitive loss, and physical decline while on treatment.^{5,6} The underrepresentation of older adults in clinical trials places them at risk of receiving inappropriate under-treatment or overtreatment for their cancer, leading to disparities in outcomes.^{5,7-9} For example, fit older patients are less likely to receive evidence-based standard-of-care cancer treatment than younger patients, whereas older patients with both cancer and comorbid conditions are too often treated with therapies with high toxicity rates and low likelihood of benefit.¹⁰

A recent Institute of Medicine report acknowledged that our current systems are ill-prepared to care for the most vulnerable patients with cancer—those who are older (especially those aged ≥ 80 years) and those who have health conditions other than cancer.¹¹ Because older patients with cancer receiving treatment are often seen by their oncology teams more frequently than by their primary care providers (PCPs),¹² community oncology practices should be equipped to recognize common age-related concerns. Despite the rapidly increasing population of older patients with cancer, most oncologists have received little geriatrics training, and therefore common aging-related conditions that influence outcomes are rarely detected.¹³⁻¹⁶

In this study, community oncologists were recruited to participate in 2 nationwide, geriatric oncology clinical trials in the University of Rochester Cancer Center's NCI Community Oncology Research Program (URCC NCORP). During enrollment, they completed a survey regarding their beliefs about and confidence in providing geriatric care.¹⁷ Similar to other studies,¹⁸⁻²¹ randomized vignettes were used to assess whether clinical factors influenced their cancer treatment decision-making. This study, however, is the first that assesses how common geriatric factors (ie, function and cognition) affect

decisions related to first-line chemotherapy in older patients with advanced cancer.

Methods

Participants

Participants were community oncologists recruited for 2 geriatric oncology studies (URCC 13059 [ClinicalTrials.gov identifier: NCT02054741] and/or URCC 13070 [NCT02107443]). Both studies involve a geriatric assessment (GA), which is a battery of validated tools to evaluate health status in multiple domains, including function, physical performance, depression, falls, and cognition,²² and evaluate whether providing a GA summary and targeted recommendations to community oncologists can improve outcomes in older patients with cancer.

Community oncologists were eligible to participate if they practiced at an NCI-funded NCORP affiliate site, their NCORP affiliate had IRB approval for either study, and they were not planning on leaving the practice. Oncologists were provided with a link to a survey via e-mail, using REDCap, a secure Web-based electronic data capture tool. If not completed, a paper survey option was offered. Oncologists were required to complete the baseline survey before participating in procedures of the main study. A waiver of consent was approved by the University of Rochester IRB for enrollment of oncologists.

Survey Design

The "Physician Baseline Survey" had 3 components: (1) oncologist demographics and practice characteristics, (2) oncologist ratings of their beliefs about and confidence with management of common geriatric issues, and (3) 1 of 8 randomly assigned clinical vignettes. The beliefs and confidence questions were developed by Cancer and Aging Research Group investigators (A.M., S.G.M., W.D.) and were modeled on a previously published survey.¹⁷ In accordance with prior studies,^{18,21} a vignette with a shared scenario was created describing an older female patient with metastatic pancreatic cancer presenting to her oncologist for a decision regarding first-line chemotherapy. A vignette of a patient with metastatic disease was selected to assess how geriatric factors may influence the weighing of risks and benefits of chemotherapy for frail older patients with limited life expectancies. The patient was an older woman who

Treatment Decision-Making for Older Patients

lived alone with a history of well-controlled hypertension, hyperlipidemia, and osteoarthritis; moderate fatigue (ECOG performance status [PS], 1); and an estimated life expectancy of ≤ 6 months, with no other symptoms from her cancer. Using this information as a base, 8 patient vignettes were created with 3 varied factors: age (72 vs 84 years), cognitive status (no impairment vs moderate impairment requiring assistance with finances and low Mini-Mental State Examination [MMSE; score of 15]), and functional status (no impairment vs impairment that included falls and deficits in instrumental activities of daily living [IADLs]). These factors were chosen because they are among the most important predictors of poor outcomes in older patients and are associated with frailty.^{5,23–27} In order to reduce bias (eg, physician answer for one vignette influences responses to others), a randomization scheme was developed so that each enrolled physician would receive 1 of the 8 vignettes.

Statistical Analysis

Descriptive statistics were used to describe physician demographics. Descriptive statistics were also used for the Likert scale questions regarding beliefs about and confidence with geriatrics, with interquartile range, mean, and median reported for each item. Bivariate associations between patient and physician characteristics and decision to treat with chemotherapy were analyzed with chi-square tests for categorical variables and *t*-tests for continuous variables. A total summary score was calculated for physician beliefs and physician confidence, and each score was categorized into tertiles due to a skewed distribution.

Logistic regression was performed to determine the independent association of the 3 varied vignette-patient characteristics (age, cognitive status, functional status) with primary outcome: whether oncologists would recommend treatment with first-line chemotherapy (yes/no) (Model A). In cases when chemotherapy was recommended, a second regression was conducted, predicting whether oncologists recommended single-agent chemotherapy or combination chemotherapy (Model B). Both models controlled for physician characteristics. Physician characteristics included sex (male/female), race (white/nonwhite), number of patients seen per day, and years in practice. A *P* value of $<.05$ was considered

significant for all analyses. Analyses were performed using SAS 9.4 (SAS Institute, Cary NC).

Results

Of 498 surveys sent to eligible community oncologists in the URCC NCORP network, 305 consented to one or both of the studies (61% response rate). The oncologists were associated with 58 individual practice sites.

Oncologist Demographics and Practice Characteristics

Participants (N=305) had a mean age of 49 years, and most were male (71%), white (65%), and non-Hispanic (94%) (Table 1). Most were board certified in oncology (95%) and had a mean of 15 years in practice post-oncology fellowship. On average, oncologists saw 17 patients per day and were clinically active 4 days of the week.

Oncologist Perspectives Regarding Geriatrics Care

Most oncologists agreed that “there should be more clinical trials designed specifically for the elderly” (90%) and “the medical care of older adults

Table 1. Physician Characteristics (N=305)

Characteristic	
Mean age (range), y	48.6 (29–76)
Sex	
Male	70.8%
Female	29.2%
Race	
White	65.0%
African American/Black	2.7%
American Indian/Alaskan Native	0.3%
Asian	31.3%
Native Hawaiian/Other Pacific Islander	0.7%
Ethnicity	
Hispanic/Latino	2.0%
Non-Hispanic	94.4%
Unknown	3.6%
Board certified in oncology	
Yes	95.1%
Mean years in practice (range)	14.6 (0.5–44)
Mean number of patients seen per day (range)	17.3 (2–45)

Mohile et al

with cancer needs to be improved” (89%) (Table 2). Many agreed that they would “appreciate additional training in topics related to the care of older adults with cancer” (79%). Most reported routinely asking patients about falls (70%). Much less commonly, oncologists agreed that they “frequently order home safety evaluations” (41%) or “enlist the help of a social worker with specialized geriatrics training” (31%). Only 23% agreed they “use standardized GA tools to help make decisions about treatment.”

Oncologist Ratings of Confidence in Geriatric Care

Most oncologists felt “quite to very confident” when it came to discussing advanced directives (84%), preventing and managing osteoporosis (72%), and

determining patients’ social support/living experiences (53%) (Table 3). Confidence was lower for other skills: $\leq 25\%$ were “quite to very confident” in conducting and evaluating a functional assessment; recognizing, evaluating, and treating dementia; and conducting an assessment and intervention for falls.

Vignette Responses

Chemotherapy Choices: Accounting for all vignettes across all scenarios, 161 oncologists (52%) said they would offer at least some form of chemotherapy. Of these, 64.6% ($n=104$) would offer single-agent chemotherapy, such as gemcitabine or capecitabine, and 35.4% ($n=57$) would offer multiagent chemotherapy, such as FOLFIRINOX or gemcitabine/nab-paclitaxel.

Bivariate Analyses: A consistent relationship was seen between vignette-patient characteristics and the decision to recommend chemotherapy (Table 4 and Figure 1). The proportion of oncologists who recommended any chemotherapy decreased with older patient age, cognitive impairment, and functional impairment. At the extremes, most oncologists (97%) randomized to vignette 1 (younger age and no functional or cognitive impairment) would recommend chemotherapy, whereas only a minority (14%) randomized to vignette 8 (older age, functional impairment, and cognitive impairment) would recommend chemotherapy. There was a general “dose-response” relationship, with older age and greater geriatric deficits leading to less aggressive therapy choices.

For the patients for whom chemotherapy was recommended, doublet chemotherapy was preferred over monotherapy only for the vignette-patient who was aged 72 years without functional or cognitive impairment (63% vs 38%). For the remainder of the vignette-patients, monotherapy was strongly preferred.

Older age (84 years), impaired function, and cognitive impairment were all associated with the decision to not recommend chemotherapy ($P<.01$ for all). For vignette-patients for whom chemotherapy was recommended, there was a significant relationship between older age and a higher likelihood of recommending single-agent therapy ($P<.01$). There was also a significant association between impaired functional and cognitive status of the vignette-patient and the likelihood of recommendation for single-agent therapy ($P<.01$).

	Agree ^c	Disagree ^d	Neutral ^e
I believe there should be more clinical trials designed specifically for older patients with cancer	90%	3%	7%
I believe that the medical care of older adults with cancer needs to be improved	89%	3%	8%
I strive to reduce the number of medications that my older patients are taking	81%	4%	15%
I would appreciate additional training in topics related to the care of older adults with cancer	79%	4%	17%
I believe that geriatric training is essential for the care of older adults with cancer	72%	9%	18%
I routinely ask my patients if they have a history of recent falls	70%	14%	16%
I frequently order home safety evaluations for my older patients	41%	35%	25%
I frequently enlist the help of a social worker with specialized geriatrics training	31%	37%	32%
I use standardized geriatric assessment tools to help make decisions about treatment	23%	49%	29%

Based on a Likert scale, where 1 = strongly disagree, 2 = somewhat disagree, 3 = neutral, 4 = somewhat agree, and 5 = strongly agree.

^aSome percentages may not total 100% due to rounding.

^bAll questions with <5 missing values.

^cPercent “agree” was calculated using the sum of physicians who chose a 4 or 5 on the Likert scale.

^dPercent “disagree” was calculated using the sum of physicians who chose a 1 or 2 on the Likert scale.

^ePercent “neutral” was calculated using physicians who chose a 3 on the Likert scale.

Treatment Decision-Making for Older Patients

Table 3. Oncologist Ratings of Confidence in Geriatrics^{a,b}

	Quite to Very Confident ^c	Slightly to Moderately Confident ^d	Not at all Confident ^e	Mean (median), n
Discuss advance directives	84%	15%	0%	4.3 (4)
Prevent and manage osteoporosis	72%	26%	2%	3.9 (4)
Determine patient's social support/living experiences	53%	45%	2%	3.5 (4)
Recognize, evaluate, and treat depression	47%	49%	4%	3.4 (3)
Make recommendations for rehabilitation	41%	54%	5%	3.2 (3)
Recognize, evaluate, and treat delirium	39%	54%	6%	3.2 (3)
Assess nutritional status	37%	61%	2%	3.2 (3)
Conduct and evaluate a functional assessment	25%	65%	10%	2.8 (3)
Recognize, evaluate, and treat dementia	23%	69%	8%	2.8 (3)
Conduct an assessment of and an intervention for falls	21%	65%	14%	2.6 (3)
Recognize, evaluate, and treat urinary incontinence	21%	64%	15%	2.7 (3)

Based on a Likert scale, where 1 = not at all confident, 2 = slightly confident, 3 = moderately confident, 4 = quite confident, and 5 = very confident.

^aSome percentages may not total 100% due to rounding.

^bAll values with <3 missing values.

^cPercent "quite to very confident" was calculated using the sum of physicians who chose a 4 or 5 on the Likert scale.

^dPercent "slightly to moderately confident" was calculated using the sum of physicians who chose a 2 or 3 on the Likert scale.

^ePercent "not at all confident" was calculated using physicians who chose a 1 on the Likert scale.

No association was found between physician beliefs about and confidence in caring for older adults and the decision to treat with chemotherapy. Total summary scores of beliefs (Table 2) and confidence (Table 3) were not associated with chemotherapy decisions (decision to treat with chemotherapy or intensity of treatment in those for whom chemotherapy was recommended).

Multivariable Analyses: Oncologist demographic and practice characteristics were not associated with the decision to treat with chemotherapy (Table 5). Varied patient characteristics were independently and strongly associated with the decision to give chemotherapy: younger age (adjusted odds ratio [aOR], 5.01; 95% CI, 2.73–9.20), no cognitive impairment (aOR, 5.42; 95% CI 3.01–9.76), and no functional impairment (aOR, 3.85; 95% CI, 2.12–7.00). Older age (aOR, 3.22; 95% CI, 1.43–7.25), impaired cognition (aOR, 3.13; 95% CI, 1.36–7.20), and functional impairment (aOR, 2.48; 95% CI, 1.12–5.46) were independently associated with prescribing single-agent over multiagent chemotherapy.

Discussion

In this study, we found that community oncologists incorporate patient age, functional impairment, and cognitive impairment into the decision-making process for cancer treatment in older adults. Despite the high prevalence of cognitive and functional decline

in older adults with cancer,⁴ ≤25% of community oncologists rated themselves as "very confident" in assessment and interventions for function, falls, and dementia. To our knowledge, this is the first study to show that, whereas only a minority of community oncologists feels confident in assessing and intervening on geriatric issues, most use this information in clinical decision-making. However, this study also shows that there is significant variability in how geriatric issues are incorporated into decision-making for older patients who are not clearly fit or frail.

Older age was independently associated with chemotherapy decisions, which may result from limited evidence of the risks and benefits of chemotherapy for older patients. For advanced pancreatic cancer, multidrug chemotherapy regimens (eg, FOLFIRINOX, gemcitabine/nab-paclitaxel) have shown survival benefits.^{28–30} The phase III trial of FOLFIRINOX versus gemcitabine alone only included patients with an ECOG PS of 0 or 1 and excluded those aged ≥76 years,²⁸ with age >65 years being significantly associated with worse survival.²⁹ Although the phase III trial of gemcitabine/nab-paclitaxel versus gemcitabine alone did not have an upper age limit (42% of patients enrolled were ≥65 years, with only 10% of patients ≥75 years), older age was associated with worse survival.³¹ In addition, the grade 3/4 toxicity rate for these regimens in the clinical trial population is >50%.^{28–31} Toxicities are more severe and prevalent in the non-clinical trial population; in one study of 46 patients who received FOLFIRINOX, 54% were hos-

Mohile et al

Table 4. Percentage of Oncologists Recommending Chemotherapy for Each Patient Vignette^a**Patient Vignette**

The patient (initials) is a _____-year-old woman with a history of well-controlled hypertension, hyperlipidemia, and osteoarthritis, who is referred for evaluation of metastatic pancreatic cancer. She has a 3-cm pancreatic adenocarcinoma with metastatic disease to the liver. Based on her cancer diagnosis, her estimated life expectancy is ≤ 6 months. She currently reports moderate fatigue, which is impacting her daily activities (ECOG PS 1), but denies any other symptoms from her cancer. She currently lives alone.

Vignette Number (N=303) ^b	Varied Factors	Explanation of Varied Factors	Oncologists Recommending Chemotherapy ^c	
Vignette 1 (n=34)	A.M. is a 72-year-old woman. She independently performs all ADLs and IADLs. She denies any memory problems or history of dementia.	Younger No functional impairment No cognitive impairment	97%	Multiagent: 63% Monotherapy: 38%
Vignette 2 (n=39)	B.L. is a 72-year-old woman. She independently performs all ADLs but requires assistance with some IADLs, including housekeeping and grocery shopping. She has had 3 falls in the past 6 months, and sustained an injury requiring an ER visit during one episode. She denies any memory problems or history of dementia.	Younger Functional impairment No cognitive impairment	74%	Multiagent: 41% Monotherapy: 59%
Vignette 3 (n=31)	C.K. is a 72-year-old woman. She independently performs all ADLs and most IADLs. She requires assistance with managing household finances due to memory problems. Cognitive testing is performed and her cognition is found to be impaired (MMSE 15).^d	Younger No functional impairment Cognitive impairment	61%	Multiagent: 39% Monotherapy: 61%
Vignette 4 (n=27)	D.J. is a 72-year-old woman. She independently performs all ADLs but requires assistance with some IADLs, including housekeeping, grocery shopping, and managing finances. She has had 3 falls in the past 6 months, and sustained an injury requiring an ER visit during one episode. Cognitive testing is performed and her cognition is found to be impaired (MMSE 15).^d	Younger Functional impairment Cognitive impairment	56%	Multiagent: 13% Monotherapy: 87%
Vignette 5 (n=39)	E.K. is an 84-year-old woman. She independently performs all ADLs and IADLs. She denies any memory problems or history of dementia.	Older No functional impairment No cognitive impairment	85%	Multiagent: 38% Monotherapy: 62%
Vignette 6 (n=41)	F.H. is an 84-year-old woman. She independently performs all ADLs but requires assistance with some IADLs, including housekeeping and grocery shopping. She has had 3 falls in the past 6 months, and sustained an injury requiring an ER visit during one episode. She denies any memory problems or history of dementia.	Older Functional impairment No cognitive impairment	44%	Multiagent: 18% Monotherapy: 82%
Vignette 7 (n=43)	G.S. is an 84-year-old woman. She independently performs all ADLs and most IADLs. She only requires assistance with managing household finances due to memory problems. Cognitive testing is performed and her cognition is found to be impaired (MMSE 15).^d	Older No functional impairment Cognitive impairment	37%	Multiagent: 19% Monotherapy: 81%
Vignette 8 (n=49)	H.T. is an 84-year-old woman. She independently performs ADLs but requires assistance with some IADLs, including housekeeping, grocery shopping, and managing finances. She has had 3 falls in the past 6 months, and sustained an injury requiring an ER visit during one episode. Cognitive testing is performed and her cognition is found to be impaired (MMSE 15).^d	Older Functional impairment Cognitive impairment	14%	Multiagent: 0% Monotherapy: 100%

Bolded items are characteristics that were varied systematically between vignettes.

Abbreviations: ADLs, activities of daily living; ER, emergency room; IADLs, instrumental activities of daily living; MMSE, Mini-Mental State Examination; PS, performance status.

^aEach physician was randomized to one vignette as part of the survey; 2 physicians did not provide a response.

^bPhysician who complete vignette questions.

^cDoublet versus monotherapy answer may not total 100% due to missing data.

^dA MMSE score of 15 is indicative of problems with learning new information, recognizing close relatives, personality changes, and behavior disorders.

Treatment Decision-Making for Older Patients

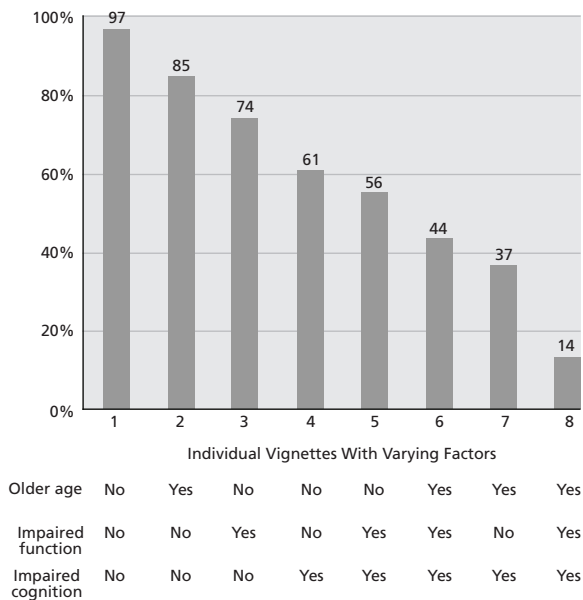


Figure 1. Percentage of oncologists who recommended chemotherapy by varied factors in vignettes.

pitalized for sepsis and 7% died from treatment.³² Hesitancy to provide multiagent chemotherapy regimens to older patients, even those who are fit, likely stems from oncologists' concerns about the ability of older adults to tolerate these regimens.³³ Conversely, many oncologists continue to offer single-agent regimens to older patients with cognitive or functional impairments (often unrecognized without a formal GA)¹⁵ despite modest benefit. This study demonstrates that lack of evidence-based data to support cancer treatment plans in older patients leads to significant variability in treatment decision-making.^{21,34–37}

In this study, physician beliefs about or confidence in their evaluation and management of age-related health issues did not influence chemotherapy decisions. However, most oncologists believe that geriatric training is essential for the care of older patients with cancer and would appreciate additional training in age-related topics. Most oncologists reported lower levels of confidence in assessing and intervening in certain geriatric syndromes—particularly dementia, functional decline, and risk for falls—precisely the areas that were found in the vignettes to influence treatment choices. These results mirror those from other studies. Among 758 PCPs, there was significant interest in learning more about dementia, urinary incontinence, and functional assessment.¹⁷ A study by Maggiore et al¹⁶ investigated perceptions toward ge-

riatrics among University of Chicago hematology/oncology fellows. Underrecognition of geriatric syndromes was identified as a gap in knowledge, as well as underappreciation of the complexity of geriatric oncology cases. Most perceived a lack of dedicated formal instruction on older patients with cancer during their fellowship. In a study by Moy et al,¹⁴ oncologist members of ASCO reported that the mandatory integration of key principles of geriatrics into oncology training was a high priority. The investigators made recommendations to include geriatric training in the fellowship curriculum and to develop geriatric oncology modules for maintenance of certification training.

Only 23% of community oncologists report using standardized GA tools in clinical practice. GA assists with the capture of age-related factors (ie, cognitive impairment and functional status) known to affect morbidity and mortality in older patients with cancer that are often not recognized in clinical practice.^{15,22,38} In addition, GA has been shown to predict tolerance to treatment and overall survival, and specific variables captured by GA can predict chemotherapy toxicity in older patients with cancer.^{5,26,39,40} Consequently, multiple guidelines, including those by NCCN, support the use of a GA in older patients with cancer to identify patients at risk for adverse outcomes.⁴¹ Falls and cognitive impairment are associated with chemotherapy toxicity in older patients.^{5,26} Although GA has demonstrated feasibility in the clinical oncology setting,^{42–45} oncologists have been slow to adopt it, which may reflect lack of knowledge, training, and systematic barriers.

In this study, GA information (eg, IADL impairments, falls, low MMSE score indicating significant cognitive impairment), when provided in vignettes, was used to guide cancer treatment recommendations. Other studies have demonstrated that GA information can influence an oncologist's treatment decisions in older patients with cancer.^{46–48} In 6 of the 10 studies in a systematic review by Hamaker et al,⁴⁷ the initial cancer treatment plan was modified in 39% of patients after GA evaluation. Nononcologic interventions based on the GA were recommended for a median of 83% of patients.⁴⁷ Nononcologic interventions included nutritional interventions, further evaluation and management of cognitive status, interventions for mobility and falls, and interventions for minimizing polypharmacy.⁴⁷ Oncologists use of geriatric factors in treatment decisions for patients in the

Mohile et al

Table 5. Multivariable Models		
Variables	aOR	95% CI
Model A^a: Decision to recommend chemotherapy vs no chemotherapy		
Physician characteristics		
Age, y	1.00	0.93–1.08
Sex		
Female	1 (Ref)	
Male	0.85	0.43–1.66
Race		
Nonwhite	1 (Ref)	
White	0.76	0.39–1.46
Number of years in practice	1.01	0.94–1.09
Number of patients seen per day	1.01	0.97–1.06
Number of days per week seeing patients	1.24	0.87–1.76
Vignette-patient characteristics		
Age, y		
72	5.01 ^b	2.73–9.20
84	1 (Ref)	
Cognitive impairment		
No	5.42 ^b	3.01–9.76
Yes	1 (Ref)	
Functional impairment		
No	3.85 ^b	2.12–7.00
Yes	1 (Ref)	
Model B^c: Decision to recommend single-agent vs combination therapy		
Physician characteristics		
Age (years)	1.01	0.92–1.11
Sex		
Female	1 (Ref)	
Male	1.00	0.39–2.60
Race		
Nonwhite	1 (Ref)	
White	1.28	0.54–3.08
Number of years in practice	1.00	0.91–1.10
Number of patients seen per day	1.01	0.95–1.08
Number of days per week seeing patients	0.75	0.46–1.24
Vignette-patient characteristics		
Age, y		
72	1 (Ref)	
84	3.22 ^b	1.43–7.25
Cognitive impairment		
No	1 (Ref)	
Yes	3.13 ^b	1.36–7.20
Functional impairment		
No	1 (Ref)	
Yes	2.48 ^b	1.12–5.46

Abbreviation: aOR, adjusted odds ratio.

^aModel A, n=279; 26 observations not included due to missing information for response and exploratory variables.^bP<.05.^cModel B, n=161; model includes only those observations where chemotherapy was recommended.

vignettes, despite their limited confidence in assessing for functional and cognitive issues in clinical practice, suggest the importance of routine use of GA in clinical practice to guide management decisions for cancer treatment and nononcologic interventions.

Limitations should be considered when evaluating the results of this study. This was a decision-making study using hypothetical vignettes, not decisions for real patients. Nevertheless, studies have shown that decisions made for vignettes were highly correlated with decisions made during patient encounters.^{18,49,50} Use of vignettes can help elucidate decision-making processes that may not be easily studied in routine practice due to ethical or practical considerations.^{18,49,50} Systematic control of variables of interest provides insight into the specific role of these selected patient factors in the decision to initiate chemotherapy, but does limit inferences for actual practice. Although the response rate for the survey was higher than that of other studies, it was still just >60%. Because oncologists completed the baseline survey as part of the recruitment procedures for geriatric oncology trials, oncologists who participated may be more sensitive to geriatric issues than those who did not participate. We did not collect detailed information on practice characteristics (eg, access to geriatricians). Despite limitations, this study has a significant strength in that it involved community oncologists from different practices and regions of the country, which improves generalizability.

Conclusions

With the use of randomized vignettes, we found that chronologic age was associated with treatment decisions. Despite their lack of confidence in certain areas of geriatric assessment and evaluation, the oncologists incorporated geriatric factors into treatment decision-making. Because the current investigation was nested in larger, ongoing multisite geriatric oncology studies, future research will examine community oncologists' decision-making for treatment of "real-world" older patients recruited into the trials. Further work is necessary to evaluate and improve geriatrics education for oncologists. As our population ages, it is increasingly important for oncologists to be able recognize geriatric issues so that appropriate evidence-based treatment is provided to patients who will be helped and not harmed.

Treatment Decision-Making for Older Patients

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