Lay Health Worker-Led Cancer Symptom Screening Intervention and the Effect on Patient-Reported Satisfaction, Health Status, Health Care Use, and Total Costs: Results From a Tri-Part Collaboration

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QUESTIONS ASKED: Can a lay health worker trained to screen patients' cancer symptoms improve patient-reported satisfaction with their care and self-reported overall and mental or emotional health? What impact does such an intervention have on 12-month health care use and total costs of care?

SUMMARY ANSWER: The intervention was associated with improvements in patient-reported satisfaction with care over time and improvements in self-reported overall health and mental or emotional health. The intervention was also associated with reductions in emergency department visits and hospitalizations and total health care spending.

WHAT WE DID: We collaborated with CareMore Health, a Medicare Advantage Health Plan, and a large, urban community oncology practice, The Oncology Institute for Hope and Innovation, to implement and evaluate this quality improvement intervention. All patients with newly diagnosed stage 3 and 4 solid tumors or hematologic malignancies who were insured by CareMore Health were enrolled in the intervention. We compared changes in patient-reported symptoms among patients in the intervention group from baseline to 12 months post-enrollment. We compared changes in patient-reported satisfaction and self-reported health status, 12-month survival, health care use, and total health care costs with those of a control group composed of similar patients who

were insured by CareMore Health and received cancer care services by the Oncology Institute for Hope and Innovation 1 year before the intervention.

WHAT WE FOUND: Patients in the intervention group had reduced symptom burden over time. As compared with the control group, the intervention was associated with significant improvements in patient-reported satisfaction and self-reported health status. Patients in the intervention group also experienced approximately 30% fewer emergency department visits and hospitalizations and had lower total health care expenditures by approximately US\$10,000 per patient as compared with patients in the control group.

BIAS, CONFOUNDING FACTORS, REAL-LIFE IMPLICATIONS: Our results reflect a unique collaboration among a payer, a large community oncology practice, and an academic center. Our study was limited to one community oncology practice and to a Medicare Advantage population. More data are required, including randomized trials, to demonstrate the generalizability of this intervention among other populations and in other settings. Despite limitations, our findings demonstrate the impact of a narrowly focused intervention on symptom screening delivered by a lay health worker and may represent one solution to improve the delivery of value-based cancer care.

Author affiliations and disclosures are available with the complete article at ascopubs.org/journal/op.

Accepted on August 16, 2019 and published at ascopubs.org/journal/op on September 24, 2019: DOI <https://doi.org/10.1200/JOP.19.00152>

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abstract

PURPOSE Poor patient experiences and increasing costs from undertreated symptoms require approaches that improve patient-reported outcomes and lower expenditures. We developed and evaluated the effect of a lay health worker (LHW)-led symptom screening intervention on satisfaction, self-reported overall and mental health, health care use, total costs, and survival.

METHODS From November 1, 2015, to September 30, 2016, we enrolled in this study all newly diagnosed Medicare Advantage enrollees with stage 3 or 4 solid tumors or hematologic malignancies who were receiving care in a community oncology practice. We evaluated symptom changes from baseline to 12 months for the intervention group. We compared with a control group (a historical cohort of Medicare Advantage enrollees diagnosed with cancer from November 1, 2014, to October 31, 2015) changes in satisfaction and overall and mental health with validated assessments at diagnosis and 5 months postdiagnosis, 12-month health care use, total costs, and survival.

RESULTS Among 186 patients in the intervention group and 102 in the control group, most were female and non-Hispanic white or Hispanic, and the mean age was 79 years. There were no survival differences between the groups. Relative to the control group, the intervention group experienced improvements in satisfaction with care (difference-in-difference: 1.35; 95% CI, 1.08 to 1.63), overall health (odds ratio, 2.23; 95% CI, 1.49 to 3.32), and mental or emotional health (odds ratio, 2.22; 95% CI, 1.46 to 3.38) over time; fewer hospitalizations (mean $\pm$ standard deviation: 0.72 ± 0.96 v 1.02 ± 1.44 ; $P = .03$) and emergency department visits per 1,000 members per year (0.61 ± 0.98 v 0.92 ± 1.53 ; $P = .03$), and lower median (interquartile range) total health care costs (\$21,266 [\$8,102-\$47,900] v \$31,946 [\$15,754-\$57,369]; $P = .02$).

CONCLUSION An LHW-led symptom screening intervention could be one solution to improve value-based cancer care.

JCO Oncol Pract 16:e19-e28. © 2019 by American Society of Clinical Oncology

ASSOCIATED CONTENT

Appendix

Data Supplement

Author affiliations and support information (if applicable) appear at the end of this article.

Accepted on August 16, 2019 and published at ascopubs.org/journal/op on September 24, 2019; DOI <https://doi.org/10.1200/JOP.19.00152>

INTRODUCTION

Acute care use is an important driver of increasing health care spending among patients with cancer.^{1,2} Although much of this use could be avoided with timely management of patient symptoms,^{1,3} important challenges persist in integrating symptom management into routine care.^{2,4,5} Barriers are multifactorial^{6,7} and include professional workforce shortages as well as lack of infrastructure^{4,5,8} and financial incentives^{9,10} that support symptom management approaches.

To date, limited evidence exists on how care delivery and payer organizations can collaborate to reduce symptom burden, especially among elderly and minority patients.^{4,9} In a comprehensive analysis of

barriers faced by providers,⁴ patients, their caregivers,⁵ and payer organizations⁹ regarding how to improve cancer care value, we identified ways in which lay health workers (LHWs) could potentially assist in delivering services, including goals-of-care conversations and symptom screening.¹¹ In a randomized trial in one Veterans Affairs facility, we demonstrated that an LHW effectively improved patient experiences and reduced health care use and total costs by encouraging patients to discuss their care preferences with their oncology providers.¹² Comprehensive lay navigation services, such as transportation coordination and distress screening, also reduce health care use and total costs of care.¹³ However, to our knowledge, it remains unknown if LHWs narrowly focused on screening

patients' symptom burden can also improve patient experiences and reduce acute care use and costs.¹¹ To address this gap, we developed a 12-month, LHW-led, telephonic symptom screening intervention and collaborated with a Medicare Advantage health plan, which provided financial and logistical support, and a community oncology practice to pilot the intervention for patients after a diagnosis of advanced stage of cancer or hematologic malignancy. Here, we present the effects of the intervention on patient satisfaction with care, self-reported overall mental or emotional health status, survival, health care use, and total health care costs.

METHODS

Study Design and Oversight

Our study was based on a quality improvement initiative implemented with CareMore Health (<http://www.caremore.com/>), a Medicare Advantage health plan serving more than 100,000 patients across seven states, and the Oncology Institute of Hope and Innovation (OIHI; <https://theoncologyinstitute.com/>), a community-based oncology practice with 35 oncologists serving 70,000 patients in 26 southern California locations. We enrolled in the intervention, from November 1, 2015 until September 30, 2016, all newly diagnosed patients who met eligibility criteria (described in the next section). Each patient participated for 12 months or until death, whichever came first. We evaluated changes in patient-reported satisfaction with care and self-reported overall, mental, or emotional health status between date of diagnosis and 5 months post-diagnosis and compared 12-month survival, health care use, and total health care costs between patients in the program and a control group of similar patients (described in the next section). The Stanford University Institutional Review Board designated the protocol (Data Supplement) as quality improvement and did not require patient consent.

Study Participants

Intervention group. The intervention eligibility criteria, predetermined by oncology providers, included all patients with newly diagnosed hematologic malignancies or stage 3 or 4 solid tumor malignancies who were enrolled in CareMore Medicare Advantage and planned to receive oncology care at OIHI. All eligible patients were assigned to the intervention (described in a later section). Patients were excluded if they did not require medical oncology services.

Control group. The control group comprised all patients who were enrolled in CareMore Medicare Advantage and newly diagnosed with stage 3 or 4 cancer or hematologic malignancies from November 1, 2014, until October 31, 2015, 1 year before the initiation of the intervention. To identify the control group, we used the OIHI cancer registry that contains patient names, payer, cancer stage, and diagnosis dates. To verify the cohort, we obtained all claims data records of patients with 2016 *International*

Classification of Diseases, Tenth Revision, Clinical Modification codes C00-D49 from the Medicare Advantage health plan to validate that all eligible patients had been accurately identified in the registry and had received cancer services during the time of interest. Patients were excluded from the control group if they did not receive any medical oncology services.

Usual Care

All participants received usual cancer care provided by OIHI and primary interdisciplinary care through CareMore health plan.

LHW-Led Symptom Screening Intervention

The intervention consisted of a 12-month telephonic program in which one LHW, supervised onsite by one physician assistant (PA), assessed patient symptoms after diagnosis using the validated Edmonton Symptom Assessment Scale (ESAS)¹⁴ with the frequency of symptom screening varying on the basis of patient risk (Data Supplement). The supervising PA risk-stratified all patients at enrollment into a high- or low-risk category. The high-risk category included all patients with metastatic cancer, any patient on active chemotherapy, any patient with a symptom score of 4 or above, or any patient with a symptom change of greater than 2 points from a prior assessment. The PA assessed patient risk weekly and reassigned patients into the high- or low-risk group on the basis of any change in these characteristics. For high-risk patients, the LHW conducted screenings by telephone once weekly for 12 months or until patients' risk status changed or until death, whichever was first. For low-risk patients, the LHW conducted screenings at least once monthly by telephone. The LHW recorded all screenings in a note in the electronic health record. The supervising PA reviewed symptom screenings daily with the LHW, initiated usual cancer care (ie, telephone advice, medications, same-day clinic visits, and referral to acute care) in response to moderate, severe, or worsening symptoms (ie, symptom score change of 2 points or more), and notified the oncology provider of the planned intervention through the electronic health record.

The supervising PA reviewed all planned interventions with the LHW, who followed up with patients by telephone one business day after the intervention was completed to reassess patients' symptoms postintervention. The LHW was an Asian/Pacific Islander woman, had a Bachelor of Arts degree, no prior clinical experience, worked 40 hours weekly, and was trained by the PA on how to administer the ESAS. The supervising PA provided 25% effort to the program and 75% effort to other practice activities.

CareMore Health supported the program by providing financial support for the LHW, 25% effort for the supervising PA, and a \$150 per patient per month payment to the oncology provider for each patient enrolled in the program. The payment to the provider was intended to cover anticipated additional costs to the oncology practice in the

form of additional clinic visits and provider time associated with management of symptoms. CareMore Health anticipated that lower health care spending on acute care use would offset its financial support for this intervention.

Outcomes

Prespecified outcomes (defined later in this section) were changes in patient-reported symptoms among patients in the intervention group and, among patients in both groups, changes in patient-reported satisfaction with care and self-reported health status (overall and mental or emotional health), survival, health care use, and total health care costs.

Symptom scores. All intervention patients were invited to complete the ESAS at time of enrollment in the program and at 12 months postenrollment. Symptom scores were measured on a scale of 0 to 10, where 0 is no symptom and 10 is the worst possible symptom.

Patient-reported satisfaction and self-reported health status.

All patients in both groups were invited to complete prospective satisfaction with care and self-reported health status outcome assessments as part of usual care at the first oncology visit after their initial diagnosis and 5 months postdiagnosis. Satisfaction with care was assessed using the “satisfaction with provider item” (question no. 18) of the validated Medicare Advantage and Prescription Drug Consumer Assessment of Health-care Providers and Systems¹⁵ survey. Patients were directed to respond to this question in regard to their oncology provider. Satisfaction was measured on a scale of 0 to 10, where 0 is the worst and 10 is the best possible satisfaction. Self-reported health status was assessed using the “rate your overall health” (question no. 23) and “rate your overall mental or emotional health” (question no. 24) items. Both items used a scale of excellent, very good, good, fair, or poor. A trained research assistant administered all assessments telephonically.

Survival. We collected death dates of each patient through CareMore Health registrars and validated by the OIHI cancer registrars.

Health care use and costs. We compared health care use and total costs (in US dollars) between groups by collecting use of the following services from CareMore Health claims data: dates of all emergency department (ED) visits, hospital admissions, discharges (including readmissions within 30 days and intensive care unit hospitalizations), and the use of hospice services. We measured all health care use within the 12-month postdiagnosis period for the patients in the control and intervention groups, allowing for a 12-month lag in data collection to account for any administrative delays in claims. We measured length of stay in the hospital by subtracting the date of hospital admission from the date

of hospital discharge. Using CareMore Health claims data, we obtained information on total costs, including all inpatient and outpatient services for 12 months after diagnosis for the control group and for 12 months after program enrollment for intervention patients.

Demographic and clinical characteristics. We collected the following additional data from the OIHI electronic health record: age, self-reported race/ethnicity, sex, and cancer diagnosis and stage. We obtained the Centers for Medicare and Medicaid Services Hierarchical Condition Category Risk Adjustment Factor (RAF)¹⁶ from CareMore Health claims data. The RAF is based on patients’ health conditions, demographic factors, Medicaid status, sex, age, and disability status.

Statistical Analysis

We used logistic regression to compare differences between the two groups for clinical and demographic characteristics (ie, sex, race/ethnicity, cancer diagnosis and stage) and dichotomous outcomes (hospice use). We compared differences in symptom scores among intervention patients from baseline to 12 months post-enrollment using one-way analysis of variance. We compared differences in satisfaction with care, self-reported overall health, and mental or emotional health over time between groups using mixed-effect linear and logistic regression models for repeated measures. We compared survival using Kaplan Meier methods and risk of death using Cox proportional hazards regression models. We compared ED visits and hospitalizations (including readmission rates and intensive care admissions) per patient using Poisson regression models with an offset term for length of follow-up and normalized ED visit and hospital admission rates per 1,000 members per year. We compared total health care costs using a generalized linear model with a γ link-log function to account for skewed data with an offset term for length of follow-up. We adjusted all models for age, sex, race/ethnicity, cancer diagnosis (in categories as demonstrated in Table 1), stage, and RAF. We conducted all significance testing at a two-sided *P* value of .05 and performed all statistical analyses with SAS, version 9.3 (SAS Institute, Cary, NC). Results of regression models are presented as between-group differences for linear regression and odds ratios for logistic regression with 95% CIs.

RESULTS

A total of 186 patients participated in the intervention and we identified 102 control subjects (Appendix Fig A1). Table 1 lists baseline characteristics of patients participating in the intervention and control groups. The majority in both groups were women, and a high proportion were non-Hispanic white and Hispanic patients. Patients in both groups had a median age of 79 years. In both groups, the majority had GI malignancies. The intervention group had

TABLE 1. Baseline Characteristics of the Study Participants

Variable	Control (n = 102)	Intervention (n = 186)	P
Male sex, No. (%)	45 (44.1)	85 (45.7)	.07
Age, mean $\pm$ SD, years	79 $\pm$ 7.5	79 $\pm$ 8.0	.42
Race/ethnicity, No. (%)*			.82
Non-Hispanic white	49 (48.1)	88 (47.3)	
Hispanic	42 (41.2)	83 (44.6)	
Non-Hispanic black	4 (3.9)	6 (3.2)	
Asian Pacific Islander	4 (3.9)	5 (2.7)	
Native Hawaiian/Alaskan Native/American Indian	3 (2.9)	4 (2.2)	
Anatomic site of cancer diagnosis, No. (%)			.16
Thoracic	13 (12.7)	29 (15.6)	
GI	29 (28.4)	50 (26.9)	
Genitourinary	15 (14.7)	33 (17.7)	
Malignant hematologic conditions	14 (13.7)	18 (9.7)	
Breast	18 (17.6)	23 (12.4)	
Other (ie, skin, brain, bone, soft tissue, head/neck)	13 (12.7)	33 (17.7)	
Cancer stage at diagnosis, No. (%)			.01
3	47 (46.1)	71 (38.2)	
4	55 (53.9)	115 (61.8)	
RAF score, mean $\pm$ SD†	2.80 $\pm$ 1.43	3.25 $\pm$ 1.78	

Abbreviations: RAF, Risk Adjustment Factor; SD, standard deviation.

*Race and ethnic group were self-reported by patient.

†Assigned by the Center for Medicare and Medicaid Services' Hierarchical Condition Category risk adjustment model to each eligible beneficiary. A beneficiary's RAF is based on health conditions the beneficiary may have, as well as demographic factors such as Medicaid status (defined as having at least 1 month of Medicaid eligibility during the base year), sex, age, and disability status.

a higher proportion of patients diagnosed with stage 4 disease. At study enrollment, 74% of patients in the intervention group were designated as high risk (data not shown).

Symptom Scores

At enrollment, the mean patient-reported symptom score among patients in the intervention group was 11.6 ± 13.2 . Symptom scores significantly decreased over time among patients who were still alive at 12-months, with the mean score being 9.2 ± 11.1 ($P = .01$)

Patient-Reported Satisfaction and Self-reported Health Status

Table 2 lists patient-reported satisfaction and self-reported health status. Patients in the intervention group were more satisfied and had greater improvements with their oncology provider from baseline to 5 months postdiagnosis than did patients in the control group (difference-in-difference, 1.35; 95% CI, 1.08 to 1.63; $P = .002$). Patients in the intervention group were also more likely to report improvements in their overall health (odds ratio [OR], 2.23; 95% CI, 1.49 to 3.32; $P < .001$) and mental or emotional health as compared with patients in the control group (OR, 2.22; 95% CI, 1.46 to 3.38; $P < .001$).

Survival

Median survival was 12 months at 12-month follow-up; 39% of patients in the intervention group and 28% in the control group had died by this follow-up. There were no differences in 12-month survival in Kaplan-Meier curves (data not shown). In the Cox proportional hazard model, we found no difference in risk of death after adjusting for age, stage of cancer, cancer diagnosis, and RAF (intervention v control hazard ratio, 1.21; 95% CI, 0.78 to 1.87; $P = .86$).

Health Care Use and Costs

Table 3 demonstrates differences in health care use and total health care costs of care among patients in the intervention group as compared with the control group. Patients in the intervention group, as compared with the control group, had an approximately 30% reduction in ED visits (number of visits per 1,000 members per year) and hospital admissions, after adjusting for clinical and demographic factors and length of follow-up. Among patients who were hospitalized, there were no differences in length of stay, readmission rates, or intensive care unit use rates between the groups. Hospice use also did not differ between the groups. Median total costs of care were approximately \$10,000 lower for patients in the

TABLE 2. Patient-Reported Satisfaction and Health Status

Variable	Usual Care (n = 100)	Intervention (n = 183)	P
Satisfaction with care, mean $\pm$ SD*†			
Baseline (diagnosis)	8.34 $\pm$ 1.83	8.10 $\pm$ 1.80	
5-month follow-up	8.10 $\pm$ 1.96	9.25 $\pm$ 1.03	
Difference in satisfaction from baseline	-0.23 $\pm$ 1.88	1.15 $\pm$ 1.79	<.001
Overall health status, No. (%)			<.001
Excellent			
Baseline	7 (6.9)	15 (8.1)	
5-month follow-up	5 (5.9)	36 (24.2)	
Very good			
Baseline	36 (35.3)	65 (35.5)	
5-month follow-up	27 (32.1)	88 (59.1)	
Good			
Baseline	44 (43.1)	77 (42.1)	
5-month follow-up	17 (20.2)	25 (16.8)	
Fair			
Baseline	9 (9.0)	21 (11.3)	
5-month follow-up	31 (36.9)	0 (0)	
Poor			
Baseline	4 (4.0)	5 (2.7)	
5-month follow-up	4 (4.8)	0 (0)	
Emotional or mental health status, No. (%)‡			<.001
Excellent			
Baseline	0 (0)	0 (0)	
5-month follow-up	0 (0)	26 (17.5)	
Very good			
Baseline	17 (17.0)	20 (10.9)	
5-month follow-up	14 (16.7)	89 (59.7)	
Good			
Baseline	49 (49.0)	95 (51.9)	
5-month follow-up	29 (34.5)	33 (22.2)	
Fair			
Baseline	30 (30.0)	56 (30.6)	
5-month follow-up	41 (48.8)	1 (0.7)	
Poor			
Baseline	4 (4.0)	12 (6.7)	
5-month follow-up	0 (0)	0 (0)	

Abbreviation: SD, standard deviation.

*Reported *P* values are from linear regression models adjusted for age, sex, race/ethnicity, cancer diagnosis, cancer stage, Risk Adjustment Factor, and length of follow-up (intervention group v control group, difference-in-difference: 1.35, 95% CI, 1.08 to 1.63).

†Ratings were scored as described in Methods.

‡Reported *P* values are from mixed models with random effects adjusted for age, sex, race/ethnicity, cancer diagnosis, cancer stage, Risk Adjustment Factor, and length of follow-up.

intervention group as compared with the control group. Median outpatient and inpatient costs were approximately \$6,000 lower among patients in the intervention group as compared with the control group.

DISCUSSION

This LHW-led symptom screening intervention is a promising approach for improving patient-reported outcomes and reducing health care use and total costs of care among

TABLE 3. Health Care Use and Total Costs of Care

Variable	Usual Care (n = 102)	Intervention (n = 186)	P
Emergency department use*			
No. of visits	0.92 ± 1.53	0.61 ± 0.98	.03
Hospital use*			
No. of admissions	1.02 ± 1.44	0.72 ± 0.96	.03
Length of stay, days	3.72 ± 6.11	3.43 ± 5.49	.69
No. of readmissions	0.10 ± 0.41	0.18 ± 0.47	.15
No. of ICU admissions	0.66 ± 1.23	0.60 ± 1.00	.65
Hospice received, No. (%)†	41 (40.2)	85 (45.7)	.37
Total health care costs, median (IQR), US dollars‡	31,946 (15,754-57,369)	21,266 (8,102-47,900)	.01
Outpatient costs	8,059 (0-23,020)	2,363 (0-18,486)	.04
Inpatient costs	19,214 (9,362-33,837)	12,181 (5,279-26,020)	.03

NOTE. Data are reported as mean ± standard deviation unless otherwise indicated. All data reported are for within 12 months after enrollment. All models were adjusted for age, sex, race/ethnicity, cancer diagnosis, cancer stage, and risk adjustment factor.

Abbreviations: ICU, intensive care unit; IQR, interquartile range.

*P value was estimated using exact Poisson regression models with an offset term for length of follow-up. Values for the number of acute care visits are reported per 1,000 members per year.

†P value was estimated using logistic regression models.

‡P value was estimated using a generalized linear model with γ link-log with offset for length of follow-up.

elderly adults in an outpatient practice. Patients in the intervention group experienced less symptom burden overtime, and, as compared with a historical cohort of similar patients, had associated improvements in satisfaction with care and self-reported overall and mental or emotional health, no differences in survival, significantly less acute care use, and lower total health care expenditures.

We provide evidence, similar to others,¹⁷⁻¹⁹ that proactive symptom screening is associated with improvements in patient-reported outcomes. Although patients in our control group, similar to what has been reported in other studies,^{20,21} experienced declines in their self-reported health status over time, we found notable associated health status improvements among patients in the intervention group. Although we did not assess the specific interventions made in response to worsening symptoms reported by patients to the LHW, patients in the intervention group experienced less symptom burden overtime and an associated reduction in ED use and hospitalizations within 1 year of follow-up, as compared with the control group, suggesting that appropriate clinical responses may have led to the improvements we found.

Unlike prior studies that relied on professionals,^{17,22-24} ours is the first we are aware of to examine the associated effects of using an LHW only to assist with symptom screening. Previously, oncology providers, patients and their caregivers, and health care payer organizations suggested the use of lay personnel to conduct proactive symptom screenings, given their shared cultural and linguistic backgrounds and time required to overcome potential symptom-related communication barriers between patients

and their health care providers.^{4,5,9} In our study, which was composed of a high proportion of elderly and Hispanic patients, populations known to experience higher rates of undertreated cancer symptoms and communication barriers as compared with other populations,²⁵⁻²⁸ it is possible that the LHW may have encouraged patients to discuss their symptom burden and advocate for interventions.⁵ The significant associated improvements in patient satisfaction, self-reported health status, and reductions in acute care use are in agreement with this supposition. As compared with prior studies that reported a 6% to 7% reduction in acute care use,^{13,17} our intervention was associated with a 30% reduction in these services. It is unclear if our intervention, which relied on a high-touch, narrowly focused approach, may have led to the findings among this elderly and racially/ethnically diverse patient population. Studies are indicated to understand the best approach for symptom identification and management.

The associated reductions in total, inpatient, and outpatient health care spending, in a setting representative of how cancer care is predominantly delivered in the United States,²⁹ is an important finding depicting the practical applicability of this approach in community-based practices. Although we expected outpatient costs to increase, given the likely possibility of additional outpatient clinic visits for identified symptoms and based on prior reports, it is possible that these findings may reflect our telephonic approach. Almost all the identified symptoms were managed by telephone by the practicing PA, thus preventing the need for additional outpatient visits. More investigation is required to better understand this finding.

This study should be interpreted in the context of limitations. First, this intervention was conducted among patients enrolled in a Medicare Advantage health plan who received oncology care in an urban community-based outpatient practice. Therefore, the generalizability of this approach to other populations and settings requires additional investigation. Our findings are important, however, because more than 80% of cancer care is delivered in community-based practices such as the one in our study.²⁹ Furthermore, this intervention was conducted with only one LHW supervised by one PA. It remains unknown if the results may be due to the intervention or the individuals conducting the intervention. Additional research is needed to understand the generalizability of the intervention when implemented by multiple LHWs. Second, our evaluation of the effects of the intervention was limited by comparison with a historic cohort and, although we are unaware of any changes in the way care was delivered for patients in the historical cohort to the end of the intervention period,

changes in care processes independent of the intervention could bias our findings. Furthermore, to minimize potential discrepancies in the identification of the historical cohort, we verified all patients in the study with claims data for all patients diagnosed with cancer during the years of study from the CareMore Medicare Advantage health plan. Finally, we did not adjust for multiple comparisons; therefore, the *P* values could be larger than reported.

In conclusion, this LHW-led symptom screening intervention among patients with advanced stages of cancer was associated with improved patient-reported outcomes, no differences in survival, and reduced acute care use and total health care costs. This intervention may represent one approach to address patients' cancer symptoms and improve the value of care. Additional research, including randomized trials, is needed to assess the generalizability of this approach in other settings.

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SUPPORT

Supported, in part, by the National Institute on Minority Health and Health Disparities of the National Institutes of Health (Grant No. K23MD013474, M.I.P.) and the California Health Care Foundation National Institutes of Health KL2 provided by the Stanford Clinical and Translational Science Award to Spectrum (Grant No. UL1 TR001085). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST AND DATA AVAILABILITY STATEMENT

Disclosures provided by the authors and data availability statement (if applicable) are available with this article at DOI <https://doi.org/10.1200/JOP.19.00152>.

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ACKNOWLEDGMENT

We thank Arnold Milstein, MD, for assisting with program design; Caroline Hagan, PhD, for assisting with claims and cost data collection and analysis; Mila Voskanyan for providing lay health workers services; Tania Vartanians, PA, for providing practitioner oversight; CareMore Health for providing support for the program; and we thank all the patient participants.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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No other potential conflicts of interest were reported.

APPENDIX

FIG A1. Assessment for eligibility and follow-up.