

Effects of Individualized Nurse-Led Care Plans on Olaparib Treatment Duration

Denise Tran, PharmD; Haesuk Park, PhD; Jordon Rabey, MS; Seth Killion, BS; S. Bobby Arelli, MD; Elaine Murphy, BS; and Yoona Kim, PharmD, PhD

The landscape of cancer treatment has evolved in recent years, with significant advances in targeted agent regimens and chemotherapy, but cancer is still life-threatening and expensive, with direct annual health care expenditures exceeding \$200 billion in 2020.^{1,2} Faced with a potentially life-threatening illness, patients with cancer require extended inpatient and outpatient care by several health professionals.³ However, during cancer treatment, the care that patients receive may be uncoordinated and fragmented because patients visit many health care providers in multiple health care settings.⁴ This is a problem because many patients with cancer have high levels of physical and psychological distress related to symptom management, considered one of the most important factors in maintaining a patient's quality of life.⁵ In many cases, symptoms can go undetected and undertreated, potentially due to the infrequency of clinic visits, gaps in understanding of treatment, and lack of communication with care teams. Studies have shown that approximately 50% of patients with cancer experience symptoms of fatigue, pain, or distress but largely do not communicate this to their providers,⁶ although 75% of patients found symptom-centric conversations to be beneficial.^{7,8} When symptoms go undetected and unmanaged, the results can be medication nonadherence, early discontinuation, and poor health outcomes.⁹

To provide coordinated, continuous, efficient, and effective care to patients with cancer, case management has been introduced.^{4,10} *Case management* is defined as a "collaborative process of assessment, planning, facilitation, care coordination, evaluation, and advocacy for options and services to meet an individual's and family's comprehensive health needs through communication and available resources to promote quality, cost-effective outcomes."¹¹ Hospital-based, nurse-led case management has been shown to improve patient health-related quality of life and to reduce medical costs and hospital admission rates among patients with cancer.^{3,4,12,13} However, little is known about the effects of nurse-led case management provided by specialty pharmacies; these pharmacies play an important role in the delivery and coordination of complex care in oncology, in which polypharmacy is common and treatment regimens are complicated. With the rapid adoption of oral oncology medications,

ABSTRACT

OBJECTIVE: To assess the effects of a nurse-led personalized care plan on the duration of olaparib therapy among patients with cancer.

STUDY DESIGN: Cohort study conducted from January 2020 to June 2022.

METHODS: Data from an independent specialty pharmacy were used to identify patients 18 years and older with at least 1 olaparib (Lynparza) prescription who were at high risk for olaparib nonadherence as assessed using a pharmacy intake survey. We compared olaparib therapy duration between patients with and without a nurse-led personalized care plan. Multivariable Cox proportional hazards regression was used to estimate adjusted HRs (aHRs) for therapy discontinuation.

RESULTS: Of 560 patients at high risk for olaparib nonadherence, 163 received a care plan and 397 did not. Commonly reported symptoms included fatigue, nausea, gastrointestinal tract problems, depression, anxiety, and pain. The care plan group had significantly longer olaparib therapy (median [IQR], 6.7 [2.5-14.3] months vs 4.9 [1.9-10.4] months; $P < .001$) and a lower risk of discontinuing treatment (aHR, 0.77; 95% CI, 0.64-0.94) than the controls. Within the care plan group, patients experiencing resolution of at least 1 symptom (median therapy duration [IQR], 10.3 [4.8-19.0] months vs 3.9 [1.9-11.4] months; $P < .001$) or at least 1 dose modification (median therapy duration [IQR], 11.9 [6.7-17.8] months vs 4.7 [1.9-11.8] months; $P < .001$) had approximately 2.5 times longer olaparib therapy duration than patients who did not.

CONCLUSIONS: A nurse-led personalized care approach effectively increased medication persistence among patients receiving olaparib for treatment of cancer, and the effect was more apparent among care plan patients who experienced symptom resolution or dose modification.

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such as PARP inhibitors, use of these agents is becoming increasingly prevalent, and more patients are receiving cancer treatment at home. Thus, it is important to understand whether, and to what extent, case management provided by specialty pharmacies improves outcomes among patients with cancers.

The aim of this study was to evaluate the effects of a nurse-led personalized care plan provided through a specialty pharmacy for patients who were identified through a risk stratification questionnaire as having high risk for nonadherence and who received olaparib (Lynparza) therapy, an oral PARP inhibitor used to treat advanced ovarian cancer, metastatic prostate cancer, metastatic pancreatic cancer, and early or metastatic breast cancer.¹⁴ Within the care plan group, we further assessed duration of olaparib therapy by the presence of at least 1 dose reduction or symptom resolution during the care program.

METHODS

Intervention

In January 2020, a specialty pharmacy implemented a risk-based care program, a personalized health care approach that utilized a multidisciplinary clinical team of nurses, pharmacists, and care coordinators and sought to leverage the nurse-patient relationship to provide customized care for each patient's unique needs. A specialty

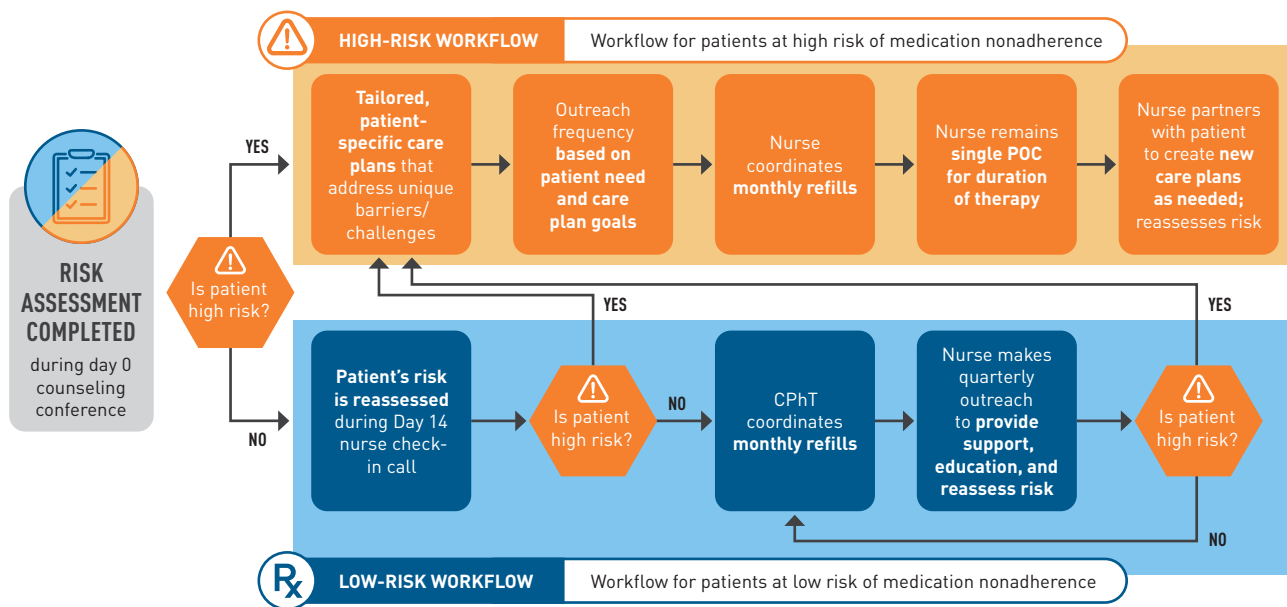
TAKEAWAY POINTS

Patients with cancer need comprehensive case management, but cancer care services are often fragmented or uncoordinated and associated with poor symptom management. Hospital-based nurse-led case management has been shown to improve health-related quality of life and reduce hospital admission rates among patients with cancer. This study investigated whether a nurse-led, risk-based, personalized care program conducted in collaboration with specialty pharmacy services would create value for patients and the health care system, which is the foundation of value-based care. Specifically, the study assessed whether a care plan would increase medication persistence with olaparib (Lynparza), an oral cancer medication that can be taken at home.

- ▶ This nurse-led personalized care program conducted through a specialty pharmacy was effective in prolonging medication persistence for patients receiving olaparib.
- ▶ The effect of the nurse-led personalized care approach was more apparent for patients with symptom resolution or dose modification during the care program.

pharmacist conducted an initial risk assessment using a survey administered to understand each patient's baseline characteristics and risk of medication nonadherence before initiating olaparib therapy. All patients were administered the same survey. A score was calculated based on patients' responses to all the survey questions. Patients were then stratified into low-risk and high-risk medication adherence groups if their total score was below or above a set value, respectively. Patients in the high-risk group were automatically enrolled in the program and were paired with a dedicated nurse who served as their point of contact throughout their course of treatment (Figure). Risk was reassessed periodically after a patient initiated therapy. Nurses created personalized, symptom-focused care plans and facilitated in-depth conversation with the patient

FIGURE. Representative Risk-Based Care Workflow



CPhT, certified pharmacy technician; POC, point of contact; Rx, prescription.

about symptoms and support—not just clinical support but also emotional and educational—as often as the patient required (eg, daily, weekly). Patients in the care plan group had a mean (SD) of 2.4 (1.39) documented care plans, with a median of 2.

Study Design and Population

We used a cohort study design to compare the duration of olaparib therapy for patients in the care plan group and patients with no care plan (control) by using data obtained from an independent specialty pharmacy (Biologics by McKesson). This data set included demographic characteristics and information on olaparib prescriptions dispensed, indication for olaparib, patient high- or low-risk level for medication nonadherence, care plan status, free-text care plan details (eg, symptoms, resolution), treatment discontinuation, and free-text adverse events. Patients included in the study were 18 years and older, received the first prescription of olaparib regardless of indication between January 2020 and June 2022, and were categorized as being at high risk of medication nonadherence as assessed by the administered survey. For patients categorized as being at high risk of medication nonadherence, those who received a care plan were in the intervention group, whereas the control group comprised patients who did not receive a care plan (for instance, patients who did not engage with the program after enrollment). The Castle Institutional Review Board exempted this study from review and waived the requirement for obtaining written informed consent due to the type of data set used in the study.

Outcomes

The primary outcome was the length of time the patient received therapy, which was calculated as the number of days between the first fill and the last fill, plus days' supply of the last fill. Differences in the median duration of therapy were compared between patients with care plans (care plan group) and patients without care plans (no care plan group). The date of the first dispense of olaparib was defined as the index date. Patients were followed up from the index date until treatment discontinuation or the end of the study period (June 2022), whichever occurred first. Treatment discontinuation was defined by a flag recorded in the data set indicating that the patient had discontinued treatment with olaparib. Because the date of treatment discontinuation was not available, it was defined as the last dispense date of medication plus days' supply of the last fill. To examine the potential heterogeneity of care plan effects in selected subgroups of patients, we conducted a subgroup analysis by age (< 65 vs ≥ 65 years). Within the care plan group, we conducted an exploratory analysis to assess data from patients who received a dose reduction vs patients who did not and from patients who were identified as having a care plan symptom resolution vs no resolution as indicated by a nurse.

Statistical Analysis

Descriptive statistics included the mean, median, and SD for continuous data and relative frequencies for categorical data.

Patient demographic (age, sex, plan type, and prescriber region) and clinical (indication, maximum and mean daily olaparib dose) characteristics were compared between the 2 groups (care plan vs no care plan). Categorical variables were compared using χ^2 tests. Continuous variables were compared using Mann-Whitney tests, a nonparametric alternative to 2-sample *t* tests. We also report the difference in restricted mean survival time for duration of therapy, an alternative measure to median survival time that is the area under the survival curve within a specific time window.¹⁵

We used a Cox proportional hazards model to compare the relative risk of treatment discontinuation between the care plan and no care plan groups, adjusting for covariates, including age and sex. Kaplan-Meier survival curves were used to depict the percentage of patients who continued to receive therapy among the cohorts. A logistic regression was used to identify factors associated with continuing therapy for more than 6 months. Covariates in this model included care plan status, age, and mean sentiment scores from an exploratory sentiment analysis. An exploratory sentiment analysis was conducted on nurse-documented free-text notes from internal adverse event data. Sentiment analysis is contextual text mining often used in marketing to evaluate sentiment (eg, positivity, negativity, or neutrality) from written or spoken language.¹⁶ We used the Python Natural Language Toolkit, a suite of libraries and programs for statistical natural language processing, on free-text clinical notes to assess whether any textual relationships could be extracted and associated with longer duration of therapy. The main scores were calculated using free-text notes in advance reporting data. Scores ranged from -1 to 1, with 1 being the most positive sentiment. A positive mean score indicated that emotions, attitudes, or opinions were positive, and a negative score indicated the opposite.

RESULTS

Patient Characteristics

A total of 2096 patients had at least 1 fill of olaparib at Biologics by McKesson between January 2020 and June 2022. Of them, 560 (26.7%) patients were at high risk of medication nonadherence and were included in the risk-based care program. Of these patients, 163 received at least 1 care plan (care plan group) and 397 did not receive a care plan (no care plan group). No statistical differences in demographic or clinical characteristics were observed between the 2 groups (Table 1). For patients in the care plan group, the most frequently reported symptoms were fatigue, nausea, gastrointestinal tract problems (eg, diarrhea and bowel changes), depression, anxiety, and pain.

Duration of Olaparib Therapy Among Patients With and Without a Care Plan

Patients in the care plan group received olaparib treatment for 1.8 months longer than patients in the no care plan group (median [IQR], 6.7 [2.5-14.3] months vs 4.9 [1.9-10.4] months; $P < .001$) (Table 2 and eAppendix Figure 1 [eAppendix available at [ajmc.com](#)]).

The restricted mean difference in the duration of therapy receipt between the 2 groups was 2.9 (95% CI, 2.3-3.4) months. In the multivariable Cox proportional hazards regression model comparing patients with vs without care plans, we adjusted for covariates that remained statistically significant in univariate analysis, which was age (< 65 vs ≥ 65 years). In the Cox model controlling for age, the care plan group had a 23% lower risk of discontinuing treatment compared with the no care plan group (adjusted HR, 0.77; 95% CI, 0.64-0.94).

In a subgroup analysis by age (< 65 and ≥ 65 years), individuals in the care plan group had a significantly longer duration of olaparib therapy than individuals in the no care plan group for both age groups (< 65 years: median [IQR], 9.7 [4.0-16.5] months vs 6.0 [2.4-11.6] months; $P < .001$; ≥ 65 years: median [IQR], 4.7 [1.9-11.4] months vs 3.3 [1.8-10.0] months; $P = .009$).

Factors Associated With Continuing Olaparib Treatment

Logistic regression conducted to identify factors associated with olaparib treatment persistence greater than 6 months indicated that as a patient's sentiment score approached 1, the probability of continuing with medication therapy for at least 6 months increased 8-fold (OR, 8.39; 95% CI, 3.65-19.28) (Table 3). Having a care plan increased the probability of continuing with medication therapy 2-fold (OR, 2.04; 95% CI, 1.41-2.95), but patients who were 65 years and older were 45% less likely to continue with medication therapy for more than 6 months (OR, 0.55; 95% CI, 0.40-0.76).

Duration of Olaparib Therapy for Patients With a Care Plan Assessed by the Presence of a Dose Reduction or Symptom Resolution

Because patients in the care plan group had additional data, including details on symptoms experienced and whether they were resolved by a nurse, we further assessed the impact of symptom resolution and dose decreases during receipt of therapy. We found that 52.8% and 30.7% of patients in the care plan group experienced at least 1 resolved symptom or dose decrease, respectively. In the care plan group, patients who had at least 1 symptom resolved (median therapy duration [IQR], 10.3 [4.8-19.0] months vs 3.9 [1.9-11.4] months; $P < .001$; differences in restricted mean survival time, 8.1 [95% CI, 7.1-9.3] months) or at least 1 dose

TABLE 1. Baseline Demographic and Clinical Characteristics of Patients With Cancer at High Risk of Medication Nonadherence Who Received Olaparib With vs Without a Care Plan

Characteristic	All (N = 560)	Care plan (n = 163)	No care plan (n = 397)	P
Age in years, mean (SD)	61.7 (12.8)	62.2 (12.9)	61.5 (12.8)	.574
Age in years, median (IQR)	62.0 (54.0-71.0)	61.0 (53.0-70.0)	63.0 (55.5-71.0)	.252
Sex, n (%)				
Female	473 (84.5%)	146 (89.6%)	327 (82.4%)	.058
Male	85 (15.2%)	17 (10.4%)	68 (17.1%)	
Unspecified	2 (0.4%)	0 (0.0%)	2 (0.5%)	
US prescriber region, n (%)				
Midwest	119 (21.3%)	30 (18.4%)	89 (22.4%)	.693
Northeast	89 (15.9%)	27 (16.6%)	62 (15.6%)	
South	188 (33.6%)	59 (36.2%)	129 (32.5%)	
West	162 (28.9%)	46 (28.2%)	116 (29.2%)	
US territories	2 (0.4%)	1 (0.6%)	1 (0.3%)	
Caregiver, n (%)				
Yes	474 (84.6%)	133 (81.6%)	341 (85.9%)	.249
No	86 (15.4%)	30 (18.4%)	56 (14.1%)	
Cancer type, n (%)				
Breast	69 (12.3%)	15 (9.2%)	54 (13.6%)	.156
Female reproductive organ (nonovarian)	37 (6.6%)	10 (6.1%)	27 (6.8%)	
Gastrointestinal tract	17 (3.0%)	6 (3.7%)	11 (2.8%)	
Ovarian	271 (48.4%)	93 (57.1%)	178 (44.8%)	
Pancreatic	16 (2.9%)	3 (1.8%)	13 (3.3%)	
Prostate	51 (9.1%)	10 (6.1%)	41 (10.3%)	
Other cancer or not specified	99 (17.7%)	26 (16.0%)	73 (18.4%)	
Payer type, n (%)				
Commercial	235 (42.0%)	69 (42.3%)	166 (41.8%)	.544
Medicaid	73 (13.0%)	19 (11.7%)	54 (13.6%)	
Medicare	248 (44.3%)	75 (46.0%)	173 (43.6%)	
Other	4 (0.7%)	0 (0.0%)	4 (1.0%)	
Maximum daily olaparib dose, n (%)				
< 600 mg	483 (86.3%)	15 (9.2%)	62 (15.6%)	.062
600 mg	77 (13.8%)	148 (90.8%)	335 (84.4%)	
Mean daily olaparib dose, n (%)				
< 600 mg	194 (34.6%)	98 (60.1%)	129 (32.5%)	.116
600 mg	366 (65.4%)	65 (39.9%)	268 (67.5%)	

modification (median therapy duration [IQR], 11.9 [6.7-17.8] months vs 4.7 [1.9-11.8] months; $P < .001$; differences in restricted mean survival time, 8.3 [95% CI, 7.2-9.4] months) had 2 to 3 times longer duration of therapy than patients who did not (Table 4).

DISCUSSION

The findings of this study suggest that a risk-based care nursing model is effective in improving the duration of therapy for patients

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TABLE 2. Differences in Duration of Olaparib Therapy Among 560 Patients With Cancer at High Risk of Medication Nonadherence With vs Without a Care Plan

Outcomes	Care plan (n = 163)	No care plan (n = 397)	Differences in restricted mean survival time (95% CI) ^a	P ^b
Duration of therapy in months, median (IQR)	6.7 [2.5-14.3]	4.9 [1.9-10.4]	2.9 [2.3-3.4]	< .001
Subgroup analysis by age for duration of therapy				
Patients ≥ 65 years (n = 235): duration of therapy in months, median (IQR)	4.7 [1.9-11.4]	3.3 [1.8-10.0]	4.0 [3.2-4.8]	.009
Patients < 65 years (n = 325): duration of therapy in months, median (IQR)	9.7 [4.0-16.5]	6.0 [2.4-11.6]	2.6 [1.9-3.4]	< .001
Regression model^c				
Adjusted HR (95% CI)	0.77 (0.64-0.94)	Reference	NR	.01

NR, not relevant.

^aThe restricted mean difference was used to compare duration of olaparib therapy between patients with and without a care plan.

^bThe Mann-Whitney test was used to compare duration of olaparib therapy between patients with and without a care plan.

^cCox model controlling for age assessing the risk of discontinuing treatment between the care plan groups.

TABLE 3. Factors Associated With Remaining Adherent to Olaparib Treatment for More Than 6 Months Among Patients at High Risk of Medication Nonadherence (N = 560)

Factor	OR	95% CI
Care plan vs no care plan	2.04	1.41-2.95
Mean sentiment score	8.39	3.65-19.28
Aged ≥ 65 years vs < 65 years	0.55	0.40-0.76

TABLE 4. Duration of Olaparib Therapy by Symptom Resolution or Dose Decrease Among Patients With a Care Plan (n = 163)

Care plan group	Duration of olaparib therapy (months)		Differences in restricted mean survival time (95% CI) ^b
	Median (IQR)	P ^a	
≥ 1 symptom resolved (n = 86)	10.3 [4.8-19.0]	< .001	8.1 [7.1-9.3]
No symptoms resolved (n = 77)	3.9 [1.9-11.4]		
Dose decrease (n = 50)	11.9 [6.7-17.8]	< .001	8.3 [7.2-9.4]
No dose decrease (n = 113)	4.7 [1.9-11.8]		

^aThe Mann-Whitney test was used to compare duration of olaparib therapy between patients with and without a symptom resolution or dose decrease.

^bThe restricted mean difference was used to compare duration of olaparib therapy between patients with and without a symptom resolution or dose decrease.

at high risk of medication nonadherence receiving an oral oncology medication. The duration of therapy was statistically significantly longer for patients in the care plan group than for patients in the no care plan group. In addition, the risk of treatment discontinuation was statistically significantly lower in the care plan group than in the no care plan group (HR, 0.77; 95% CI, 0.64-0.94). Among patients in the care plan group, those experiencing symptom resolution or dose modification during their participation in the care program received therapy for approximately 2.5 times as long as

those who did not. This finding is particularly salient because increased symptom burden and medication-related toxic effects, such as those commonly reported in this population, can lead to early treatment discontinuation among patients with cancer.¹⁷

We also found that patients 65 years and older were less likely to continue olaparib therapy than patients younger than 65 years after controlling for the receipt of care plans. This finding was unsurprising, given that older patients are known to have more risk factors for medication nonadherence and may be affected by age-related factors, such as functional or visual impairments, cognitive deficits, polypharmacy, or comorbidities. These findings suggest that patients 65 years and older may have age-related risk factors that may be less modifiable through symptom-focused care plans. As a patient's sentiment score (recorded in the nurses' notes) increased, indicating positive emotions, attitudes, or opinions, the probability of continuing with medication therapy significantly increased, suggesting that improving patient-centered care, patient optimism, and patient satisfaction led to better health outcomes.

The findings from this study showed that within the care plan group, the duration of therapy for patients who experienced symptom resolution or dose modification was approximately 2.5 times as long as that for patients who did not, suggesting that symptom resolution and dose modification may be key factors for prolonging medication persistence in nurse-led personalized care programs among patients with cancer. Our findings aligned with those from a previous study conducted at Memorial Sloan Kettering Cancer Center, in which patients who frequently reported their symptoms to their care teams via questionnaires were more likely to be alive at 1 year, had a longer mean duration of therapy, and had fewer emergency department visits.¹⁸

A recent meta-analysis also reported that nurse-led case management intervention among patients with cancer was associated with shorter times from diagnosis to treatment and improved treatment completion rates compared with the regular care group.¹⁹ Because nurses contacted patients and followed up on care plans, patient symptoms were more likely to be addressed during the current care plan program. Although symptoms may not always be completely resolved, the severity of symptoms may be reduced, and patients may be able to self-manage symptoms with better mitigation strategies.

We note a few study challenges and areas for improvement. First, a risk questionnaire was administered to assess risk of medication nonadherence prior to starting treatment using a static questionnaire in which each response option had an assigned weight. After a total risk score was calculated, patients were placed into low- or high-risk medication nonadherence categories. The existing risk questionnaire assessed factors that impact medication adherence, such as the patient's functional status, emotional distress, and financial barriers, but these factors may not be comprehensive. Thus, more comprehensive risk assessment (eg, using intelligent technology and advances in artificial intelligence) to more precisely and proactively identify patients who may need additional support is warranted for a successful risk-based care program. This risk assessment should be dynamic—based on all available and recent data—to ensure timely care is provided. Second, there was an opportunity for patient-reported symptoms to be systematically categorized in accordance with academic and clinical consensus. The current program records symptoms using free text rather than set categorizations. Patients with cancer experience a common set of symptoms, such as those specified in the core symptom set from the National Cancer Institute's Symptom Management and Health-Related Quality of Life Steering Committee.^{18,20} Such categorization along with clinical decision support technologies may enhance nurse workflow by ensuring that guideline-based recommendations are automatically provided for a particular symptom, enabling nurses to work more efficiently and spend more time having in-depth conversations with patients. Third, the accuracy and validity of sentiment analysis for this use case warrant further exploration, such as utilizing natural language processing and sentiment analysis to assess a patient's sentiment during each interaction and incorporating these data into their risk score in real time.

The evidence provided in this study highlights the importance of accurate risk stratification to ensure that patients receive the level of care they need and of personalized care plans that address each patient's unique needs. The current program, as designed, demonstrated positive outcomes, suggesting that delivery of a medication nonadherence risk-based care approach through a specialty pharmacy is effective for prolonging duration of therapy and lowering treatment discontinuation rates. As the adoption of oral oncology medication increases and newer therapies become available, finding ways to scale these types of risk-based care programs through specialty pharmacy services will be key to supporting adherence to therapy and improved health outcomes.

Limitations

The first and main limitation of the present study is that the study population was derived from a single specialty pharmacy and thus may not be representative of all patients receiving olaparib for the treatment of cancer. Because data on olaparib prescriptions dispensed at other pharmacies were not available, it is possible that patients were considered to have discontinued treatment when they filled olaparib prescriptions at other pharmacies. However, we

analyzed the Decision Resources Group (now Clarivate) pharmacy claims data set for patients receiving olaparib from January 2020 to June 2022. We found that very few patients filled olaparib at more than 1 pharmacy and that the mean duration of olaparib therapy was 6.4 months (data not shown), approximately 2 months less than that in our care plan group. Second, eligibility data were not available; thus, medication discontinuation due to loss or change of insurance coverage was unknown. Third, sample sizes were relatively small, particularly among patients with care plans, which did not allow for further subgroup analyses. Fourth, some of the data relied on documentation by the nurses, such as resolution of care plans and notes used for the sentiment analysis. Variations in nurse documentation practices were possible.

CONCLUSIONS

This study provides evidence for the effectiveness of a personalized, risk-based care approach to helping patients with cancer manage their symptoms. Patients at high risk of medication nonadherence who had personalized care plans remained persistent on their medication for longer than patients with no care plan, despite having risk factors associated with treatment nonadherence. This effect was more apparent for patients with a care plan who experienced a symptom resolution or dose modification. ■

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Author Affiliations: Arine Inc (DT, JR, YK), San Francisco, CA; University of Florida (HP), Gainesville, FL; McKesson Corporation (SK, EM), Las Colinas, TX; AstraZeneca (SBA), Wilmington, DE.

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Address Correspondence to: Yoona Kim, PharmD, PhD, Arine, 595 Market St #2550, San Francisco, CA 94105. Email: ykim@arine.io.

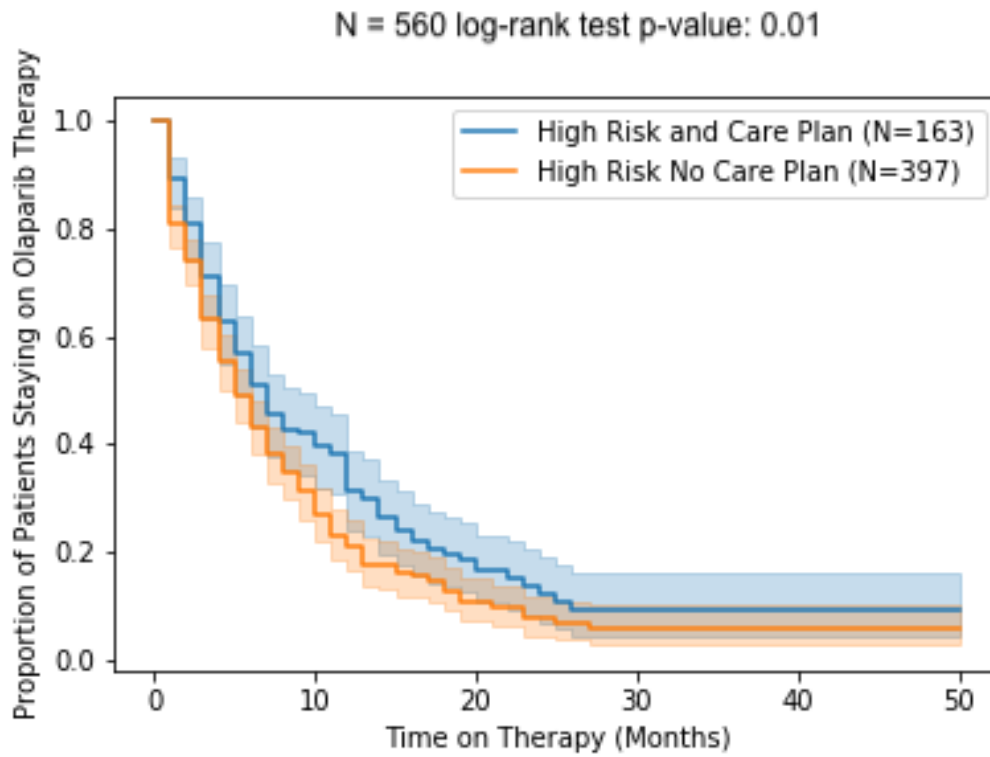
REFERENCES

1. Pérez-Herrero E, Fernández-Medarde A. Advanced targeted therapies in cancer: drug nanocarriers, the future of chemotherapy. *Eur J Pharm Biopharm.* 2015;93:52-79. doi:10.1016/j.ejpb.2015.03.018
2. Mariotto AB, Enewold L, Zhao J, Zeruto CA, Yabroff KR. Medical care costs associated with cancer survivorship in the United States. *Cancer Epidemiol Biomarkers Prev.* 2020;29(7):1304-1312. doi:10.1158/1055-9965.EPI-19-1534
3. Wu C, Bannister W, Schumacker P, Rosen M, Ozminkowski R, Rosoff A. Economic value of a cancer case management program. *J Oncol Pract.* 2014;10(3):178-186. doi:10.1200/JOP.2014.001384
4. Joo JY, Liu MF. Effectiveness of nurse-led case management in cancer care: systematic review. *Clin Nurs Res.* 2019;28(8):968-991. doi:10.1177/1054773818773285
5. Steinhilber KE, Christakis NA, Clipp EC, McNeilly M, McIntyre L, Tulskey JA. Factors considered important at the end of life by patients, family, physicians, and other care providers. *JAMA.* 2000;284(19):2476-2482. doi:10.1001/jama.284.19.2476

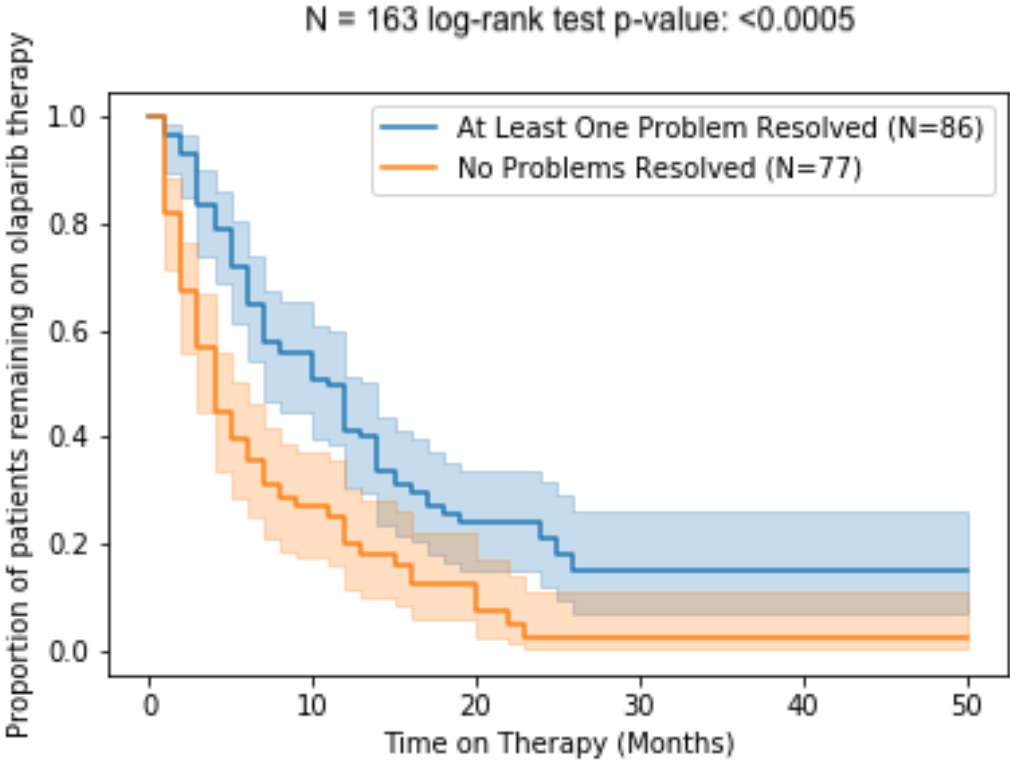
6. Vogelzang NJ, Breitbart W, Cella D, et al. Patient, caregiver, and oncologist perceptions of cancer-related fatigue: results of a tripart assessment survey: the Fatigue Coalition. *Semin Hematol*. 1997;34(3 suppl 2):4-12.
7. Butt Z, Wagner LI, Beaumont JL, et al. Longitudinal screening and management of fatigue, pain, and emotional distress associated with cancer therapy. *Support Care Cancer*. 2008;16(2):151-159. doi:10.1007/s00520-007-0291-2
8. Stover AM, Basch EM. Implementation of symptom questionnaires into oncology workflow. *J Oncol Pract*. 2016;12(10):859-862. doi:10.1200/JOP.2016.015610
9. Anhang Price R, Elliott MN, Zaslavsky AM, et al. Examining the role of patient experience surveys in measuring health care quality. *Med Care Res Rev*. 2014;71(5):522-554. doi:10.1177/1077558714541480
10. Hsu YH, Chai HY, Lin YF, Wang CH, Chen SC. Health-related quality of life and satisfaction with case management in cancer survivors. *J Clin Nurs*. 2017;26(23-24):4597-4604. doi:10.1111/jocn.13805
11. What is a case manager? Case Management Society of America. Accessed May 13, 2023. <https://cmsa.org/who-we-are/what-is-a-case-manager/>
12. Chen YC, Chang YJ, Tsou YC, Chen MC, Pai YC. Effectiveness of nurse case management compared with usual care in cancer patients at a single medical center in Taiwan: a quasi-experimental study. *BMC Health Serv Res*. 2013;13:202. doi:10.1186/1472-6963-13-202
13. Wulff CN, Vedsted P, Søndergaard J. A randomised controlled trial of hospital-based case management to improve colorectal cancer patients' health-related quality of life and evaluations of care. *BMJ Open*. 2012;2(6):e001481. doi:10.1136/bmjopen-2012-001481
14. Lynparza. Package insert. AstraZeneca; 2023. Accessed November 20, 2024. https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/208558s025lbl.pdf
15. Kloecker DE, Davies MJ, Khunti K, Zaccardi F. Uses and limitations of the restricted mean survival time: illustrative examples from cardiovascular outcomes and mortality trials in type 2 diabetes. *Ann Intern Med*. 2020;172(8):541-552. doi:10.7326/M19-3286
16. Sentiment analysis and how to leverage it. Qualtrics. Accessed May 13, 2023. <https://www.qualtrics.com/experience-management/research/sentiment-analysis/>
17. Walker MS, Masaquel AS, Kerr J, et al. Early treatment discontinuation and switching in first-line metastatic breast cancer: the role of patient-reported symptom burden. *Breast Cancer Res Treat*. 2014;144(3):673-681. doi:10.1007/s10549-014-2892-z
18. Basch E, Deal AM, Kris MG, et al. Symptom monitoring with patient-reported outcomes during routine cancer treatment: a randomized controlled trial. *J Clin Oncol*. 2016;34(6):557-565. doi:10.1200/JCO.2015.63.0830
19. Wu YL, Padmalatha KMS, Yu T, et al. Is nurse-led case management effective in improving treatment outcomes for cancer patients? a systematic review and meta-analysis. *J Adv Nurs*. 2021;77(10):3953-3963. doi:10.1111/jan.14874
20. Reeve BB, Mitchell SA, Dueck AC, et al. Recommended patient-reported core set of symptoms to measure in adult cancer treatment trials. *J Natl Cancer Inst*. 2014;106(7):dju129. doi:10.1093/jnci/dju129

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eAppendix Figure 1. Kaplan-Meier Survival Curves describing the proportions of patients remaining persistent to olaparib therapy among patients with cancer at high risk of medication nonadherence with vs. without a care plan (n=560)



eAppendix Figure 2. Kaplan-Meier Survival Curves describing proportions of patients remaining persistent to olaparib therapy with vs. without symptom resolution in the Care Plan group (n=163).



eAppendix Figure 3. Kaplan-Meier Survival Curves describing proportions of patients remaining persistent to olaparib therapy with vs. without dose modification in the Care Plan group (n=163)

