



Research Letter to Editor

The association between health care contact days, care experience, and out-of-pocket spending for older adult cancer survivors

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1. Introduction

Health care contact days – in which patients receive health care in an in-person ambulatory or institutional setting – can represent needed care access but also burdens for older adults and their care partners [1]. Both access needs and care burdens may be especially pronounced for older adult cancer survivors, who often manage heightened medical complexity even years after diagnosis or active treatment [2]. For instance, older adult cancer survivors enrolled in traditional Medicare experienced an average of 28 contact days in 2019, compared to 21 days among the general traditional Medicare population [1,2]. This higher quantity of contact days likely reflects necessary care of cancer-related and non-cancer comorbidities as well as potential care inefficiency. Most of these days were spent in ambulatory care settings and involved a single service (e.g., tests only) per day, suggesting missed opportunities to coordinate care [2,3].

Despite cancer survivors likely having distinct care needs, care use patterns, and perspectives on the tradeoffs between the burdens and benefits of care [4–6], there is limited evidence on how contact days may contribute to care experience for these patients. In qualitative work, cancer survivors have highlighted how medical care can be burdensome and all-consuming (the “time toxicity” of care) while recognizing the value of this care for improving survival and quality of life and providing reassurance [5]. A study of 2019 survey-linked claims data examined the

relationships between contact days and aspects of care experience and financial burden in the general traditional Medicare population [7]. But no research, to our knowledge, has assessed these relationships among cancer survivors specifically. In this study, we used nationally representative survey and Medicare claims data from 2022 to assess the relationship between older adult cancer survivors' contact days and their care satisfaction, ease in managing care, and out-of-pocket spending.

2. Materials and methods

We used data from the 2022 Medicare Current Beneficiary Survey (MCBS), a nationally representative rotating panel survey, linked to traditional Medicare claims and the MCBS Cost Supplement. Among community-dwelling beneficiaries aged ≥65-years-old without end-stage renal disease and continuously enrolled in traditional Medicare and alive for the entire year, we defined cancer survivors as those who self-reported history of any non-skin cancer (Methods A.1). We then examined survey subsamples with data on care satisfaction, ease in managing care, and out-of-pocket spending.

To measure health care contact days during the 2022 calendar year, we used an established, claims-based definition: days spent receiving in-person ambulatory services (i.e., office visits, tests, imaging, procedures, or treatments) or receiving care in an institution (i.e., hospital, emergency department, skilled-nursing facility, or hospice facility) (Methods

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Table 1
Sociodemographic characteristics, clinical factors, care-seeking behaviors, and contact days of respondents in each study cohort.

Characteristics	Care Satisfaction Cohort, No. (Weighted %) N = 1074	Ease Managing Care Cohort No. (Weighted %) N = 863	Out-of-Pocket Spending Cohort No. (Weighted %) N = 574
Age			
65–69	150 (20.2)	111 (18.8)	80 (20.1)
70–74	228 (29.9)	185 (30.5)	135 (32.0)
75–79	231 (22.7)	196 (23.6)	118 (20.8)
80–84	243 (14.4)	199 (14.8)	125 (14.3)
85+	222 (12.8)	172 (12.3)	116 (12.8)
Sex			
Female	601 (54.6)	487 (55.2)	317 (52.4)
Male	473 (45.4)	376 (44.9)	257 (47.6)
Race^a			
African-American	62 (6.9)	46 (6.6)	37 (8.3)
Asian	12 (1.8)	10 (2.0)	5 (1.3)
White	964 (88.6)	781 (89.2)	514 (87.9)
Other	19 (1.4)	14 (1.3)	9 (1.4)
Hispanic Ethnicity^b			
No	1020 (95.7)	826 (96.6)	547 (95.8)
Yes	51 (4.1)	35 (3.2)	25 (3.9)
Income			
≤100% FPL	50 (4.5)	34 (3.4)	25 (3.9)
>100%–≤ 200% FPL	176 (14.6)	141 (15.0)	83 (13.5)
>200% FPL	848 (80.8)	688 (81.7)	466 (82.6)
Education			
Did not graduate high school	64 (5.2)	45 (4.5)	30 (4.7)
High school graduate	217 (21.5)	169 (20.5)	110 (22.8)
Some college, including vocational and associates degrees	316 (27.7)	253 (27.9)	162 (24.3)
Bachelor's degree or above	477 (45.6)	396 (47.1)	272 (48.2)
Beneficiary Residence^c			
Metropolitan	808 (78.7)	654 (79.4)	439 (78.7)
Non-Metropolitan	265 (21.3)	208 (20.5)	134 (21.3)
Years Since Diagnosis			
Fewer than 2	145 (13.8)	107 (12.1)	76 (13.2)
2 or more	574 (48.9)	471 (50.6)	291 (46.8)
No diagnosis in claims	355 (37.3)	285 (37.3)	207 (40.0)
Mean Years Since Diagnosis	4.3 (2.9)	4.4 (2.5)	4.5 (3.1)
Chronic Conditions			
0	52 (9.5)	38 (8.7)	31 (10.3)
1 to 5	281 (27.8)	226 (27.8)	148 (26.5)
6 to 10	553 (47.6)	457 (49.3)	298 (48.5)
>10	188 (15.1)	142 (14.2)	97 (14.8)
Poor Self-Rated Health^d			
No	1027 (95.6)	830 (96.1)	552 (95.8)
Yes	43 (4.1)	30 (3.7)	19 (3.9)
Functional Impairment			
No	773 (74.4)	629 (75.3)	423 (75.4)
Yes	301 (25.7)	234 (24.8)	151 (24.6)
Worry About Health More Than Average^e			
No	887 (81.4)	723 (82.3)	482 (82.1)
Yes	162 (16.4)	121 (15.5)	78 (15.4)
Go to Doctor as Soon as Feel Bad^f			
No	635 (59.3)	525 (60.9)	349 (60.0)
Yes	428 (39.7)	329 (38.2)	220 (39.0)
Avoid Going to Doctor			
No	919 (86.4)	749 (87.6)	500 (87.1)
Yes	155 (13.6)	114 (12.4)	74 (12.9)
Total Contact Days, Mean (SD)	25.3 (24.3)	24.5 (21.8)	26.2 (24.8)
Institutional Contact Days, Mean (SD)	2.8 (9.7)	2.1 (8.2)	2.7 (9.5)
Ambulatory Contact Days, Mean (SD)	22.5 (20.0)	22.3 (18.8)	23.5 (21.0)

Abbreviations: FPL = Federal Poverty Level, SD = standard deviation.

^a Race question refused or answered “don't know” for 17, 12, 9.

^b Ethnicity question refused or answered “don't know” for 3, 2, 2.

^c Beneficiary residence missing for 0, 1, 0.

^d Self-rated health question refused or answered “don't know” for 4, 3, 3.

^e Health worry question refused or answered “don't know” for 25, 19, 14.

^f Doctor soon question refused or answered “don't know” for 11, 9, 5. Miss- ingness was handled using the indicator method.

A.2, Table A.1) [1]. Our outcomes were care satisfaction (survey; high satisfaction in overall care quality in past year vs less than high), ease in managing care (survey; very easy to manage vs not), and out-of-pocket spending in 2022 (survey and claims; including deductibles, coinsurance) (Table A.2). For the first two outcomes, we used logistic regression in which the predictor was deciles of contact days. For spending, we used linear regression with total contact days as the predictor, modeled using linear splines with knots at 11 and 32 contact days (we identified these inflection points using a LOESS plot that showed three distinct linear portions of the relationship). Models were adjusted for socio-demographic and clinical factors and care-seeking behaviors that were previously associated with contact days or could plausibly explain differences in care experience, and run with survey sample and replicate weights that account for geographic clustering (see Definition A.2 for details) [1,2,4]. In a sensitivity analysis, we restricted the sample to beneficiaries with a claims-based cancer diagnosis while controlling for years since cancer diagnosis (based on the date of the first claim with diagnosis; <2 versus ≥2 years).

Mass General Brigham's Institutional Review Board waived review. We used RStudio (v2024.04.2) and considered 2-sided *P*-values <0.05 significant. The study followed STROBE reporting guidelines.

3. Results

Subsamples included 574 to 1074 respondents (weighted: 3,450,939 cancer survivors across subsamples) (Table 1). One-third were between 70 and 74 years old and 79% lived in metropolitan areas. More than 90% had ≥1 chronic condition and more than 60% had ≥6 chronic conditions. Among respondents with recorded cancer diagnosis date, ~80% were diagnosed ≥2 years prior. Across subsamples, 4% reported poor self-rated health, 25%–26% reported functional limitations, 15–16% reported greater than average health worry, and 13–14% reported they avoided going to the doctor.

In 2022, respondents had mean(standard deviation [SD]) 24.5(21.8) to 26.2(24.8) total contact days across subsamples. More than half of the respondents reported care satisfaction (660 [62.5%]) and ease in managing care (483 [55.7%]). Mean (SD) out-of-pocket spending in 2022 was \$4212 (4831).

Care satisfaction was similar across deciles of contact days, with no significant between-decile differences in adjusted predicted proportion reporting satisfaction (Fig. 1). For ease in managing care, the estimated slope was negative across the first eight deciles of contact days, and the relationship was not statistically significant. There was a significant linear relationship between contact days and out-of-pocket spending for individuals with 11–32 contact days (42.9% of the sample); each additional contact day within this range was associated with an additional \$185.33 (95% confidence interval 114.08–256.58) in out-of-pocket spending per beneficiary. In sensitivity analyses, relationships were similar (Fig. A.1).

4. Discussion

In this nationally representative study of older adult cancer survivors, we found that having more contact days was not associated with greater care satisfaction or with significantly lesser ease in managing care, while each additional contact day was associated with \$185 more out-of-pocket spending for many beneficiaries.

Our results build on a prior study of the general traditional Medicare population in 2019 in which patients at the lower and higher ends of the

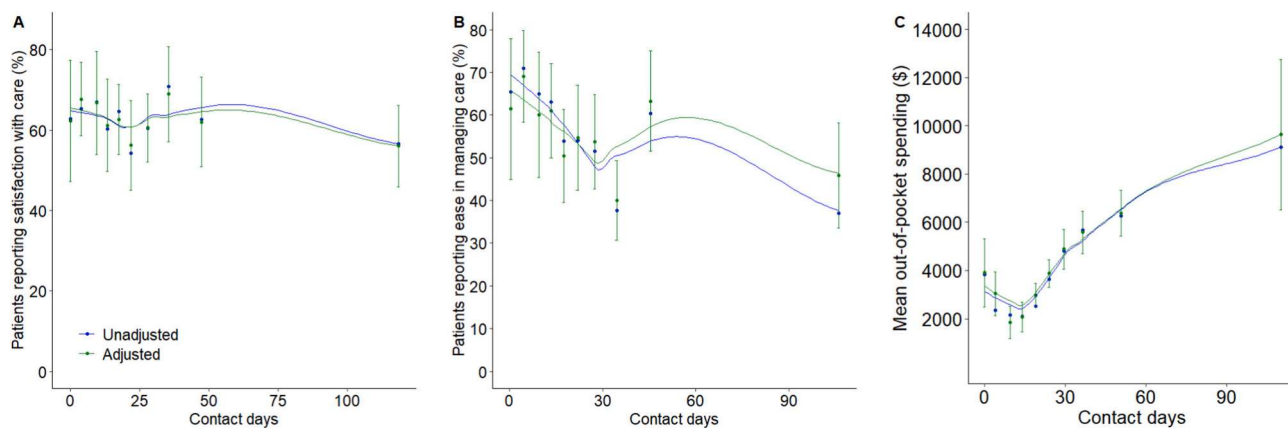


Fig. 1. Unadjusted and adjusted associations between contact days and (A) satisfaction with care, (B) ease in managing care, or (C) out-of-pocket spending. Percentages and means are weighted to be nationally representative according to survey design. We divided respondents into deciles of contact days. Each point on the graph is plotted on the x-axis at the midpoint of the decile it represents (e.g., if the decile spans 1–4 contact days, the point is plotted at 2.5). Deciles in the care satisfaction subsample included 491,077–605,548 weighted respondents (unweighted 62 to 131). Deciles in the ease of managing care subsample included 433,085–560,365 weighted respondents (unweighted 48 to 102). Deciles in the out-of-pocket spending subsample included 440,970–640,398 weighted respondents (unweighted 39 to 74). The unadjusted (blue) data points represent the raw percentage of respondents in each decile reporting satisfaction (A) or ease of managing care (B) or the deciles mean out-of-pocket spending (C). The adjusted (green) data points were obtained by calculating predictive marginal means for each decile from the logistic models in (A) and (B), and by setting each observation to the midpoint of each decile and calculating predictive means at each of those midpoints in (C). LOESS curves were fit using the estimates for each of the 10 deciles. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

contact day distribution reported lower satisfaction with care, while more contact days were associated with decreased ease in managing care and, for a majority of the distribution, an added \$49 in out-of-pocket spending per day [7]. In the current study of cancer survivors, more contact days were associated with greater out-of-pocket spending per day, yet no difference in satisfaction. These findings may be influenced by cancer survivors' unique clinical needs and outlook on care. For instance, compared to the 2019 general traditional Medicare population, cancer survivors were less likely to report avoiding going to the doctor, suggesting that cancer survivors may value health care more than the general population [1]. Though there was likely insufficient power to detect a significant inverse relationship between contact days and ease in managing care, the care patterns we observed may reflect that additional contact days can confer additional challenges in organizing care-related tasks like visit travel, medication management, and insurance paperwork [5].

We estimate that each additional contact day, for almost half of patients, was associated with an additional \$185 in out-of-pocket spending (though this relationship flattens at higher numbers of contact days as patients may increasingly reach catastrophic drug spending levels or out-of-pocket maxima in their supplemental plans). This is nearly four times that of the general population in 2019, though less than those actively receiving intravenous chemotherapy [7,8]. This may be related to receiving more and/or costlier tests and treatments for active cancer, surveillance of a prior cancer, or comorbidities arising from cancer or cancer treatment. This estimate, while high, represents a lower bound of actual patient and caregiver economic costs, given, for example, opportunity costs from missed work and transportation costs such as bus fares or parking (median \$12/day at major cancer centers) [9].

This study has strengths including use of a nationally representative sample. Limitations include the lack of data on Medicare Advantage enrollees and the relatively small sample size, which raises the possibility of underpowering and precludes assessment of differences by cancer type, years since diagnosis, or sociodemographic characteristics. Finally, the cross-sectional, observational study design precludes causal inference; while we control for some measures of medical complexity and care behaviors, unobserved differences in disease burden and other factors could confound the relationship between contact days and care

experience.

Our findings demonstrate the substantial time and financial burdens faced by older adult cancer survivors and the importance of finding ways to minimize these burdens [10], for example by reducing unnecessary services (such as too-frequent cancer surveillance testing [11]), colocalizing and coordinating care so that patients can get multiple needed services at the same visit, and reducing travel burdens by shifting care to the home via home visits and telemedicine when appropriate [12].

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CRedit authorship contribution statement

Nicholas E. Daley: Conceptualization, Methodology, Formal analysis, Writing – original draft. **Arjun Gupta:** Conceptualization, Methodology, Writing – review & editing, Supervision. **Ishani Ganguli:** Conceptualization, Methodology, Resources, Writing – review & editing, Supervision.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jgo.2026.102970>.

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