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Oncology and primary care involvement in breast cancer survivorship care more than 5 years after initial treatment

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Abstract

Purpose: Very little is known about primary care involvement in the care of cancer survivors beyond the initial five years post-treatment when transitioning to primary care is guideline-recommended for many survivors.

Patients and Methods: The iCanCare study is a longitudinal survey of women diagnosed with breast cancer in 2014–15 identified in the Georgia and Los Angeles Surveillance, Epidemiology and End Results registries. Women were surveyed during initial treatment and again ~6 years later in survivorship (2021–22) (N=1412, 60% response rate). Respondents were asked which provider led their survivorship care (oncology, shared care, primary care provider (PCP)) and PCP management of eight common survivorship issues (range 0–32). Multivariable-adjusted associations of participant characteristics with survivorship care delivery and PCP management of survivorship issues were evaluated using logistic and linear regression models, respectively.

Results: Over half of the women (57.2%) reported oncologist-led survivorship care delivery, 20.5% shared-care and 22.4% PCP-led. PCP management of survivorship issues was moderate (mean 11.4, 95% CI 11.0–11.8), and was highest (often/always discussed) for medication management (50.1%), improving physical activity (49.1%), and chronic disease management (43.6%). Greater confidence in PCP's ability to manage survivorship care (vs. no or little confidence) was associated with PCP-led delivery (p=0.01) and more PCP management of survivorship issues (p<0.0001).

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Conclusion: In this diverse cohort of breast cancer survivors, primary care involvement in survivorship care delivery and management of common survivorship issues remains low even more than 5 years after completing treatment and little variation was seen across survivor sociodemographic or clinical characteristics. Confidence in PCP ability to manage survivorship care was found to be important and may represent an opportunity to foster transition to primary care-led survivorship care delivery.

Introduction

There are currently over 18 million cancer survivors in the US; breast cancer survivors account for almost a quarter of this population at 4.1 million¹. Over 20 years ago, the National Academy of Medicine released its report, *From Cancer Patient to Cancer Survivor: Lost in Transition*², calling for improving care and quality of life for cancer survivors. Yet, even today, receipt of high-quality survivorship care remains elusive; in part due to an aging patient population, many of whom have ongoing treatment-related issues (e.g., pain, fatigue) and unmet physical and psychosocial needs (e.g., recurrence worry, issues related to finances and employment) that persist during survivorship^{3–5}.

National organizations have called for more primary care provider (PCP) involvement to meet the challenges of survivorship care delivery, especially for survivors with low risk of cancer recurrence^{6, 7}. There is strong evidence that suggests that survivorship care primarily delivered by PCPs as compared to oncologists results in increased receipt of preventive care services, higher patient satisfaction, and reduced costs, all without compromising cancer-specific outcomes (recurrence, quality of life)^{8, 9}. Despite this, implementation of primary care-led models of survivorship care delivery has lagged. Challenges include uncertainty around PCP knowledge about survivorship care, lack of clarity around provider roles in survivorship care delivery, and poor communication and coordination of survivorship care between primary and oncology care teams^{10–12}. Prior research has primarily focused on the immediate phase after completing definitive treatment for cancer or has solely characterized utilization in the survivorship period.¹³ Very little is known at the population level about primary care involvement later into the survivorship period, particularly beyond the initial five years post-treatment when transitioning to primary care is recommended for many survivors.^{7, 14}

To address this gap, we surveyed early-stage breast cancer survivors who were >5 years out from having completed their initial cancer treatment. We aimed to describe primary care involvement in the delivery of survivorship care and the management of common survivorship-related issues and examine variation in primary care involvement by survivor characteristics. We hypothesized that primary care involvement in survivorship care may be greatest in vulnerable populations of survivors at risk of poor outcomes, where continuity between primary care providers and patients may help mitigate disparities in receipt of high-quality survivorship care^{15–17}.

Methods

Study Population

The iCanCare Study is a population-based, longitudinal survey study of women with early-stage breast cancer and their providers. Women ages 20–79 who were newly diagnosed with early-stage breast cancer (stages 0-II) in 2014–2015 as reported to the SEER registries of Georgia and Los Angeles County were surveyed (median time from diagnosis to baseline survey completion = 7 months). Black, Asian and Latina women were oversampled.¹⁸ Women were ineligible if they had stage III or IV disease, had tumors >5cm, or could not complete a questionnaire in English or Spanish (N= 258). A total of 2502 women completed surveys (68% baseline response rate).

Eligible respondents were then sent a follow-up survey approximately 6 years after their initial diagnosis in 2021–2022 (N=2361). Women were ineligible for the follow-up study if they were deceased (N=108) or were too ill or incompetent to participate (N=33). Eligible women were sent a packet of follow-up survey materials, with an option to complete the survey online. We excluded an additional 281 women from our analytic sample due to breast cancer recurrence (N=58), second primary cancer diagnosis (N=204), not having a PCP (N=48), and missing data (N=25) (categories not mutually exclusive; Figure 1). Responses to the surveys were merged with SEER clinical data and baseline survey data, and a de-identified analytic dataset was created. The study was approved by the University of Michigan Institutional Review Board and the state and institutional IRBs of the SEER registries.

Measures: Questionnaire content was developed based on the NCI Quality of Survivorship Care Framework, prior literature, and our prior work^{19–21}. We used standard techniques to assess content validity, including systematic review by design experts, cognitive pretesting with 19 breast cancer survivors, and pilot studies in a sample of 67 women who participated in the baseline iCanCare study.

Outcomes

We were interested in two outcomes: patient-reported survivorship care delivery and PCP management of survivorship issues. This distinction was purposeful: first, this allowed us to characterize the extent to which primary care is involved in the delivery of survivorship care >5 years after initial treatment, and second, beyond addressing provision of services such as follow-up mammograms and general preventive services, providers are often responsible for addressing several other issues during survivorship, such as management of physical side effects, psychosocial needs, and chronic diseases.

Patient-reported survivorship care delivery: Patients were asked, “Since you finished your primary treatment of breast cancer, which provider has been most responsible for providing your follow-up care?”, with response categories that included “almost always my PCP”, “usually my PCP”, “both providers have been equally responsible”, “usually my oncology provider”, and “almost always my oncology provider”. Responses were categorized as oncologist-led (combining “usually” and “almost always my oncology

provider”) vs. shared-care (“both providers have been equally responsible”) vs. PCP-led (combining “usually” and “almost always my PCP”) for analyses.

Patient-reported PCP management of survivorship issues: Patients were asked to report how often (5-point Likert type scale from “never” to “always”) their PCP discussed eight common survivorship issues with them: a) symptoms related to recurrence, b) managing physical side effects of cancer treatment, c) emotional issues related to cancer, d) financial problems related to cancer, e) medication management, f) ongoing medical problems (chronic disease management), g) improving physical activity, and h) other lifestyle changes. A summary scale was then created, with an overall response range from 0–32. Responses were categorized into tertiles corresponding to low (0–10.7), moderate (10.8–21.4), and high (21.5–32) levels of PCP management of survivorship issues.

Patient characteristics

Sociodemographic characteristics were obtained from patient-report at follow-up except for race/ethnicity, which was from baseline: race/ethnicity, education, insurance status, and marital status. Clinical variables obtained from patient-report at baseline included receipt of breast cancer treatment and at follow-up included endocrine therapy and number of comorbidities which included heart disease, chronic obstructive pulmonary disease, diabetes, blood clots, connective tissue disease, stroke, and depression. Age at diagnosis, stage at diagnosis and site were ascertained from the SEER registry.

Patient-reported attitudes and experiences

Prior literature shows that confidence in PCP ability to provide cancer follow-up care is low by both patients and providers^{22–25}. Patient-perception of PCP ability was ascertained by asking respondents, ‘How confident are you in your primary care provider’s overall ability to handle your follow-up care after your breast cancer diagnosis and treatment?’ with responses on a 5-point Likert type scale from ‘not at all confident’ to ‘extremely confident’. Responses were categorized as not at all/little confident vs. somewhat confident vs. very/extremely confident. We also assessed continuity with their PCP (“How long have you been seeing your current primary care provider?”), and frequency of visits to their PCP (“In the past 2 years, how many times have you had a visit with your PCP?”), both which could influence PCP involvement during survivorship.

Statistical Analysis

Patient sociodemographic and clinical characteristics were summarized using descriptive statistics. The distribution of patient-reported survivorship care delivery and PCP management of survivorship issues was estimated using proportions or means. Using Rao-Scott chi-squared tests and ANOVA, we compared patient-reported survivorship care delivery and PCP management of survivorship issues across patient characteristics (age, race/ethnicity, education, insurance status, and comorbidities). We then used weighted multivariable regression models to examine variation in the association of patient characteristics with patient-reported survivorship care delivery and PCP management of survivorship issues, adjusting for patient demographic and clinical characteristics as described above and SEER site. We fit a weighted generalized logit regression model for the

patient-reported survivorship care delivery outcome with three levels (oncologist-led, shared care, and PCP-led) and a weighted linear regression model for the PCP management of survivorship issues scale outcome. Lastly, we explored the influence of patient-perception of PCP ability on survivorship care delivery and PCP management of survivorship issues.

Despite item-level missingness being low, 15% of respondents were excluded from our models due to missing data. To account for the potential impact of missing data, values for missing items were imputed using sequential regression multiple imputation using IVEware in SAS.²⁶ We generated ten independently imputed datasets. Multivariable regression models were used to estimate associations for each imputed dataset separately, and the results were combined for inference using PROC MIANALYZE in SAS. The multivariable modeling results using the imputed data are presented and results using the observed complete-case data were similar (Supplemental Tables 1, 2). To confirm the robustness of the specification of our survivorship care delivery outcome, we also conducted sensitivity analyses grouping this outcome as PCP-led vs shared care/oncologist-led, and fit multivariable models using imputed data. The results were similar (Supplemental Table 3).

All multivariable statistical analyses incorporated weights to account for differential probabilities of sample selection and non-response and to assure that the distributions of our sample resemble those of the target population. All analyses were performed by using SAS 9.4 (SAS Institute, Cary, NC).

Results

A total of 1,412 out of 2,361 eligible women completed the follow-up survey (follow-up response rate 60%). Compared to responders, non-responders were older (31% 70+ years vs. 23.3%; $p<0.01$), Black or Latina (19.4% Black and 24.5% Latina vs. 17.9% and 17.6% respectively; $p<0.01$), with Medicaid or Medicare insurance (14.4% Medicaid and 17.7% Medicare vs. 9.0% and 12.7% respectively; $p<0.01$), had 2+ comorbidities (51.9% vs 43.0%; $p<0.01$) and a subsequent cancer diagnosis (6.8% vs. 3.8%; $p<0.01$) (Supplemental Table 4). Table 1 describes our cohort characteristics. On average, women were 59.5 years, were diagnosed with stage I (56.8%) or II (24.0%) breast cancer, were treated initially with breast conserving surgery (64.4%), radiation therapy (64.0%), and endocrine therapy (74.6%), and were over 6 years into their survivorship (mean 6.90, SD 0.35). At follow-up, 27.3% were currently on endocrine therapy. The majority had at least 2+ comorbidities (58.3%). The cohort included a diverse population of white (51.2%), Black (18.7%), Asian (9.7%) and Latina (18.5%) women with varying levels of education (26.3% high school graduate or less, 29.0% some college/technical school, 25.0% college graduate, and 19.7% graduate degree or more). The majority of patients reported seeing their current PCP for > 5 years (53.3%) and seeing their PCP at least 3 times over the past 2 years (38.0% 3–5 times/2 years, 18.1% 6+ times/2 years). The majority also reported being very/extremely confident (64.7%) in their PCP's ability to manage survivorship care.

Patient-reported survivorship care delivery

Over half of the respondents reported their oncologist was most responsible for providing their survivorship care (57.2%), while 20.5% reported shared-care between the oncologists

and PCP, and 22.4% reported PCP-led delivery. We did not see statistically significant differences by patient factors in patient-reported survivorship care delivery in the multivariable models (Table 2).

Patient-reported PCP management of survivorship issues

Overall, PCP management of survivorship issues was moderate (mean summary score 11.4 (range 0–32), 95% CI 11.0–11.8). Patient report of PCP management was highest (often/always discussed) for medication management (50.1%), improving physical activity (49.1%), chronic disease management (43.6%), and other lifestyle changes (40.3%) (Figure 2). In bivariate analyses, women with 2+ comorbidities (vs. 0 comorbidity; mean summary score 12.4 vs. 10.3, $p<0.0001$), women with high school degree/GED (vs. graduate degree or higher; mean summary score 12.4 vs. 11.2, $p=0.03$) and Black women (vs. white women; mean summary score 12.6 vs. 10.8, $p=0.03$) were more likely to report more PCP management of survivorship issues. We did not see statistically significant differences by patient factors in patient-reported PCP management of survivorship issues in the multivariable models (Table 3).

Patient attitudes and experiences

In bivariate analyses, women who reported PCP-led or shared-care were more likely to report they were very/extremely confident in their PCP's ability to manage survivorship care (67.4% and 73.4%, respectively) compared to women who reported oncologist-led delivery (60.8%) ($p=0.01$) (Table 4a). Similarly, patients who reported being very/extremely confident in their PCP's ability to manage survivorship care were also more likely to report more PCP management of survivorship issues (mean summary score 13.3 vs 6.8 for those with not/a little confidence; $p<0.0001$) (Table 4b).

Discussion

In this population-based study of early-stage breast cancer survivors >5 years out from initial treatment, we found that primary care involvement in survivorship care delivery remains low and PCP management of common survivorship issues was only moderate. The majority of women reported their oncologist was still largely responsible for survivorship care delivery. This is despite nearly two-thirds of patients reporting high confidence in the ability of their PCP to manage survivorship care. While national organizations recommend transitioning survivorship care to primary care for many of these patients after the 5-year mark, our results show primary care involvement remains low, and little variation was seen across survivor sociodemographic or clinical characteristics.

Prior studies to date assessing survivorship care delivery have mainly focused on the immediate period after treatment. Extensive data has shown which providers patients see for their survivorship care in the early phase after completing cancer treatment^{20, 22, 27}. Recent findings from Birken et al found that most survivors being followed at a single cancer center were lost to PCP follow-up 5–7 years post-diagnosis.¹³ Our findings build upon these by characterizing provider involvement in survivorship care delivery more than 5 years out from treatment and across diverse care delivery settings, including community practices.

Taken together, the results from Birken et al and our study suggest that transitioning survivorship care to PCPs for lower risk survivors at the 5-year mark is not routinely happening. Thus, transitioning patients to primary care for survivorship requires concerted efforts at a policy/system level. While there have been consensus statements encouraging risk-stratified survivorship care pathways (i.e., patients at low risk of cancer recurrence can be followed by primary care), there are no clear guidelines that recommend transitioning survivors to primary care for continued survivorship care.^{7, 14} This likely contributes to the lack of systematic implementation of care pathways, i.e., transitioning the appropriate patients to primary care for survivorship. This is also despite prior literature showing PCPs' willingness to participate in survivorship care.^{22, 28–31} Failing to transition appropriate patients to primary care has real-world practice implications as it exacerbates well known current capacity constraints within oncology. Indeed, Sussman et al. showed that ~25% of breast cancer survivors who were > 5 years post diagnosis continue to see a cancer specialist.³² An important next step to improving the efficiency in survivorship care delivery in the US is determining how to best operationalize and implement risk-stratified care models clinically.

Women in this cohort reported varying levels of PCP management of common survivorship issues. Not surprisingly, more frequent PCP management was reported for issues routinely managed in primary care (e.g., medications, chronic diseases). But very few patients reported often or always discussing more typical cancer-related issues such as symptoms related to recurrence or managing physical side effects of treatment or emotional issues; this was true even for those who reported PCP-led survivorship care delivery (data not shown). As national organizations recommend transitioning low-risk survivors to primary care during survivorship, we need to ensure that *all* essential components of high-quality survivorship care—which includes managing long-term and late effects from treatment and psychosocial needs—are effectively addressed. To achieve this, it will be important to ensure PCPs are knowledgeable about survivorship and confident in managing survivorship-related issues, both commonly reported barriers to primary care involvement^{33, 34}. Indeed, survivorship care guidelines have been shown to improve PCP confidence in providing care³⁵. Developing guidelines that are primary care focused and targeted to a primary care audience is an important next step.

Women who reported confidence in PCP ability to manage survivorship care were more likely to report both PCP-led survivorship care delivery and PCP management of survivorship issues. While two thirds of women reported being very/extremely confident in their PCP's ability to manage survivorship care, primary care involvement still was low. This suggests a need to translate patient confidence about the ability of PCPs to provide survivorship care to clinically operationalizing PCP-led survivorship care delivery. Despite rich data showing primary care involvement in survivorship leads to improved patient-reported outcomes and decreased costs without compromising detection of cancer recurrence, some cancer specialists and patients remain hesitant about transitioning survivorship to primary care. For example, the majority of oncologists²² do not perceive that PCPs have the skills to provide survivorship follow-up. Patients also have reported lack of confidence in PCP knowledge around their cancer-related issues²³. Especially for women who remain on endocrine therapy for their breast cancer beyond the initial 5 years, they

may view this as continued cancer treatment and thus, prefer to still see oncology. Cancer specialists should discuss with their patients their changing role as well as the increasing role of primary care during survivorship. This will be helped by encouraging patients to continue seeing their PCP throughout their cancer care as well as communicating with PCPs to keep them informed about their patient's care, including issues that the PCP should follow. This will help facilitate setting expectations for both patients and PCPs transitioning to primary care when appropriate. Indeed, our prior work in this cohort showed that women who reported high PCP engagement in their cancer care during treatment were less likely to prefer oncology-led survivorship care after initial treatment¹⁹.

There are potential limitations to acknowledge. Our results summarize patient report of provider involvement in survivorship care delivery. It may be that patient perception differs from actual care delivery, but our study builds upon those focused on utilization by elucidating patient perceptions about provider involvement in survivorship care.^{13, 32} Additionally, the measure of provider involvement was not specifically anchored on the timing of the expected transition to primary care at year 5, and thus, respondents may have considered a longer time frame in survivorship (from initial treatment until time of survey) and not just after the expected transition at year 5. While this cohort is comprised of a diverse sample of women who are cared for across different practice settings, the cohort was sampled from two geographic areas of the US. Thus, generalizability to other settings may be limited.

In conclusion, most women with a history of early-stage breast cancer reported their oncologist was primarily responsible for their survivorship care >5 years after completing initial treatment and PCP involvement in the management of common survivorship issues was only moderate. Our results underscore the importance of patient confidence in PCP ability to manage survivorship care as this was positively associated with greater PCP-led delivery and management of survivorship issues. With a growing population of cancer survivors who need ongoing care, efforts should focus on transitioning appropriate patients (e.g., early-stage disease, low risk for recurrence) to primary care for follow-up.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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REFERENCES

1. American Cancer Society. Cancer Treatment & Survivorship Facts & Figures 2022–2024. Atlanta: American Cancer Society; 2022. <https://www.cancer.org/research/cancer-facts-statistics/survivor-facts-figures.html>
2. Institute of Medicine, National Research Council. From Cancer Patient to Cancer Survivor: Lost in Transition. The National Academies Press; 2006:534.
3. Fan R, Wang L, Bu X, Wang W, Zhu J. Unmet supportive care needs of breast cancer survivors: a systematic scoping review. *BMC Cancer*. Jun 26 2023;23(1):587. doi:10.1186/s12885-023-11087-8 [PubMed: 37365504]
4. Harrison JD, Young JM, Price MA, Butow PN, Solomon MJ. What are the unmet supportive care needs of people with cancer? A systematic review. *Support Care Cancer*. Aug 2009;17(8):1117–28. doi:10.1007/s00520-009-0615-5 [PubMed: 19319577]
5. Mayer DK, Nasso SF, Earp JA. Defining cancer survivors, their needs, and perspectives on survivorship health care in the USA. *Lancet Oncol*. Jan 2017;18(1):e11–e18. doi:10.1016/s1470-2045(16)30573-3 [PubMed: 28049573]
6. Medicine Io. Delivering high-quality cancer care: Charting a new course for a system in crisis. . Washington, DC: The National Academies Press. 2013;doi:10.17226/18359
7. Alfano CM, Mayer DK, Bhatia S, et al. Implementing personalized pathways for cancer follow-up care in the United States: Proceedings from an American Cancer Society-American Society of Clinical Oncology summit. *CA Cancer J Clin*. May 2019;69(3):234–247. doi:10.3322/caac.21558 [PubMed: 30849190]
8. Vos JAM, Wieldraaijer T, van Weert H, van Asselt KM. Survivorship care for cancer patients in primary versus secondary care: a systematic review. *J Cancer Surviv*. Feb 2021;15(1):66–76. doi:10.1007/s11764-020-00911-w [PubMed: 32815087]
9. Chan RJ, Crawford-Williams F, Crichton M, et al. Effectiveness and implementation of models of cancer survivorship care: an overview of systematic reviews. *J Cancer Surviv*. Feb 2023;17(1):197–221. doi:10.1007/s11764-021-01128-1 [PubMed: 34786652]
10. Collaço N, Lippiett KA, Wright D, et al. Barriers and facilitators to integrated cancer care between primary and secondary care: a scoping review. *Support Care Cancer*. Jan 22 2024;32(2):120. doi:10.1007/s00520-023-08278-1 [PubMed: 38252169]
11. Love M, Debay M, Hudley AC, et al. Cancer Survivors, Oncology, and Primary Care Perspectives on Survivorship Care: An Integrative Review. *J Prim Care Community Health*. Jan-Dec 2022;13:21501319221105248. doi:10.1177/21501319221105248 [PubMed: 35678264]
12. Lawrence RA, McLoone JK, Wakefield CE, Cohn RJ. Primary Care Physicians' Perspectives of Their Role in Cancer Care: A Systematic Review. *Journal of General Internal Medicine*. 2016/10/01 2016;31(10):1222–1236. doi:10.1007/s11606-016-3746-7 [PubMed: 27220499]
13. Birken SA, Peluso AG, Shalowitz DI, et al. Primary Care Provider Visits Among Cancer Survivors 5–7 Years Postdiagnosis. *JCO Oncol Pract*. May 22 2024;Op2300699. doi:10.1200/op.23.00699
14. McCabe MS, Partridge AH, Grunfeld E, Hudson MM. Risk-based health care, the cancer survivor, the oncologist, and the primary care physician. *Semin Oncol*. Dec 2013;40(6):804–12. doi:10.1053/j.seminoncol.2013.09.004 [PubMed: 24331199]
15. Salloum RG, Hornbrook MC, Fishman PA, Ritzwoller DP, O'Keeffe Rossetti MC, Elston Lafata J. Adherence to surveillance care guidelines after breast and colorectal cancer treatment with curative intent. *Cancer*. Nov 15 2012;118(22):5644–51. doi:10.1002/cnrc.27544 [PubMed: 22434568]

16. Lipsyc-Sharf M, Ballman KV, Campbell JD, et al. Age, Body Mass Index, Tumor Subtype, and Racial and Ethnic Disparities in Breast Cancer Survival. *JAMA Network Open*. 2023;6(10):e2339584–e2339584. doi:10.1001/jamanetworkopen.2023.39584 [PubMed: 37878313]
17. Research AAFc. AACR Cancer Disparities Progress Report: Disparities in Cancer Survivorship. Accessed 3/1/2024, <https://cancerprogressreport.aacr.org/disparities/cdpr22-contents/cdpr22-disparities-in-cancer-survivorship/>
18. Hamilton AS, Hofer TP, Hawley ST, et al. Latinas and breast cancer outcomes: population-based sampling, ethnic identity, and acculturation assessment. *Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*. Jul 2009;18(7):2022–9. doi:10.1158/1055-9965.EPI-09-0238
19. Radhakrishnan A, Li Y, Furgal AKC, et al. Provider Involvement in Care During Initial Cancer Treatment and Patient Preferences for Provider Roles After Initial Treatment. *J Oncol Pract*. Apr 2019;15(4):e328–e337. doi:10.1200/jop.18.00497 [PubMed: 30856036]
20. Wallner LP, Li Y, Furgal AKC, et al. Patient Preferences for Primary Care Provider Roles in Breast Cancer Survivorship Care. *J Clin Oncol*. Sep 1 2017;35(25):2942–2948. doi:10.1200/jco.2017.73.1307 [PubMed: 28700276]
21. Wallner LP, Abrahamse P, Uppal JK, et al. Involvement of Primary Care Physicians in the Decision Making and Care of Patients With Breast Cancer. *J Clin Oncol*. Nov 20 2016;34(33):3969–3975. doi:10.1200/jco.2016.67.8896 [PubMed: 28440678]
22. Cheung WY, Aziz N, Noone AM, et al. Physician preferences and attitudes regarding different models of cancer survivorship care: a comparison of primary care providers and oncologists. *J Cancer Surviv*. Sep 2013;7(3):343–54. doi:10.1007/s11764-013-0281-y [PubMed: 23526165]
23. Hudson SV, Miller SM, Hemler J, et al. Adult cancer survivors discuss follow-up in primary care: ‘not what i want, but maybe what i need’. *Ann Fam Med*. Sep-Oct 2012;10(5):418–27. doi:10.1370/afm.1379 [PubMed: 22966105]
24. Potosky AL, Han PK, Rowland J, et al. Differences between primary care physicians’ and oncologists’ knowledge, attitudes and practices regarding the care of cancer survivors. *J Gen Intern Med*. Dec 2011;26(12):1403–10. doi:10.1007/s11606-011-1808-4 [PubMed: 21785923]
25. Chubak J, Aiello Bowles EJ, Tuzzio L, et al. Perspectives of cancer survivors on the role of different healthcare providers in an integrated delivery system. *Journal of cancer survivorship : research and practice*. 2014/06// 2014;8(2):229–238. doi:10.1007/s11764-013-0335-1 [PubMed: 24352871]
26. Ragunathan TBP, Solenberger PW. *Multiple Imputation in Practice with Examples Using IVEware*. 1st ed. Chapman & Hall; 2018.
27. Friesse CR, Martinez KA, Abrahamse P, et al. Providers of follow-up care in a population-based sample of breast cancer survivors. *Breast Cancer Res Treat*. Feb 2014;144(1):179–84. doi:10.1007/s10549-014-2851-8 [PubMed: 24481682]
28. Radhakrishnan A, Chandler McLeod M, Hamilton AS, et al. Preferences for Physician Roles in Follow-up Care During Survivorship: Do Patients, Primary Care Providers, and Oncologists Agree? *J Gen Intern Med*. Feb 2019;34(2):184–186. doi:10.1007/s11606-018-4690-5 [PubMed: 30284174]
29. Cheung WY, Neville BA, Cameron DB, Cook EF, Earle CC. Comparisons of patient and physician expectations for cancer survivorship care. *J Clin Oncol*. May 20 2009;27(15):2489–95. doi:10.1200/jco.2008.20.3232 [PubMed: 19332716]
30. Klabunde CN, Ambs A, Keating NL, et al. The role of primary care physicians in cancer care. *J Gen Intern Med*. Sep 2009;24(9):1029–36. doi:10.1007/s11606-009-1058-x [PubMed: 19597893]
31. Dossett LA, Hudson JN, Morris AM, et al. The primary care provider (PCP)-cancer specialist relationship: A systematic review and mixed-methods meta-synthesis. *CA: A Cancer Journal for Clinicians*. 2017;67(2):156–169. doi:10.3322/caac.21385 [PubMed: 27727446]
32. Sussman J, Cerasuolo JO, Pond GR, Bainbridge D, Seow H. Patterns of Survivorship Follow-Up Care Among Patients With Breast Cancer: A Retrospective Population-Based Cohort Study

in Ontario, Canada, Between 2006 and 2016. *JCO Oncol Pract.* Jul 25 2024;Op2300813.
doi:10.1200/op.23.00813

33. Chan RJ, Agbejule OA, Yates PM, et al. Outcomes of cancer survivorship education and training for primary care providers: a systematic review. *J Cancer Surviv.* Apr 2022;16(2):279–302. doi:10.1007/s11764-021-01018-6 [PubMed: 33763806]
34. Hayes BD, Young HG, Atrchian S, et al. Primary care provider-led cancer survivorship care in the first 5 years following initial cancer treatment: a scoping review of the barriers and solutions to implementation. *J Cancer Surviv.* Nov 15 2022;doi:10.1007/s11764-022-01268-y
35. Townsend JS, Rohan EA, Sabatino SA, Puckett M. Use of Cancer Survivorship Care Guidelines by Primary Care Providers in the United States. *J Am Board Fam Med.* Oct 11 2023;36(5):789–802. doi:10.3122/jabfm.2023.230036R1 [PubMed: 37775322]

Context Summary

Key Objective:

Which providers—oncologists or primary care providers (PCPs)—are survivors seeing for their follow-up survivorship care beyond the initial five years after completing cancer treatment when transitioning to PCP is recommended?

Knowledge Generated:

57% of survivors reported their oncologist was still largely managing their follow-up survivorship care whereas only 22% reported their PCP was. When survivors did report their PCP was managing survivorship issues, it was most often for discussing issues routinely managed by primary care—medication management (50%), improving physical activity (49%), and chronic disease management (44%)—and less so for cancer-related issues such as managing side effects from treatment.

Relevance

Early-stage breast cancer survivors continue to see their oncologists for their follow-up survivorship care even more than 5 years after completing their initial treatment. Failing to transition the appropriate survivors to primary care exacerbates current oncology workforce constraints.

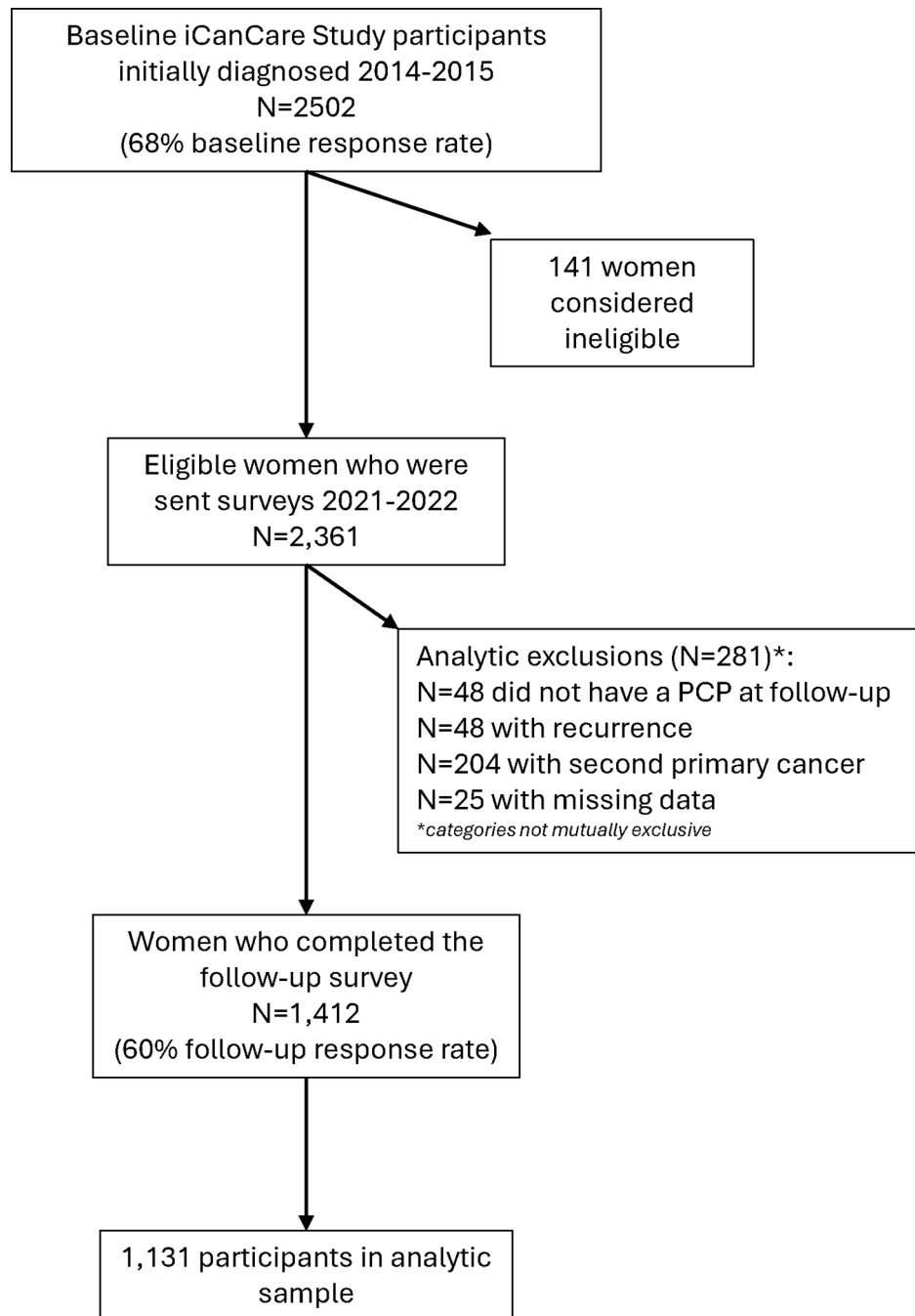


Figure 1:
iCanCare Follow-up Study Population (N=1,131)

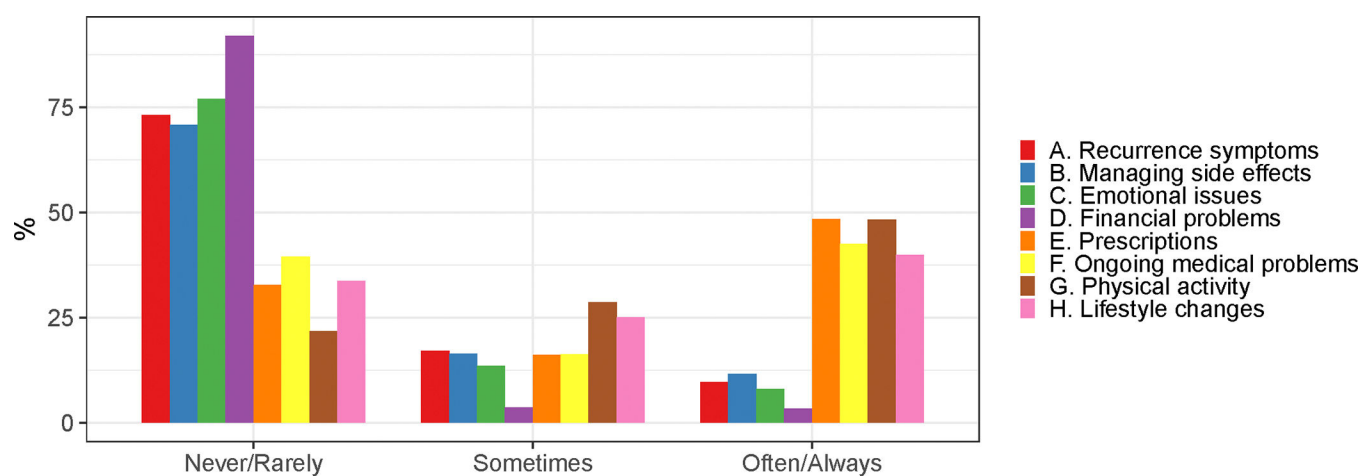


Figure 2:
Patient-reported PCP management of survivorship issues (weighted percentages)

Table 1:
Patient demographic and clinical characteristics (N=1,131)

Characteristic	N	Unweighted (%)
Age at diagnosis		
<40	22	1.95
40 – 49	136	12.02
50 – 59	296	26.17
60 – 69	423	37.40
70+	254	22.46
Race/Ethnicity		
White	579	51.19
Black	212	18.74
Latina	209	18.48
Asian	110	9.73
Other/Unknown/Missing	21	1.86
Education		
High school/GED or less	287	26.31
Some college or technical school	316	28.96
College graduate (Bachelor's degree)	273	25.02
Graduate degree or higher	215	19.71
Insurance		
None	19	1.74
Medicaid	48	4.41
Medicare or VA	557	51.15
Private/Other	465	42.70
Marital status		
Married	617	56.50
Divorced	207	18.96
Separated	16	1.47
Living with partner	20	1.83
Widowed	154	14.10
Never married	78	7.14
Number of comorbidities		
0	214	18.92
1	258	22.81
2+	659	58.27
Stage at diagnosis		
0	211	19.13
1	627	56.84
2	265	24.03

Characteristic	N	Unweighted (%)
Surgery treatment		
Breast Conserving Surgery	719	64.43
Unilateral Mastectomy	192	17.20
Bilateral Mastectomy	205	18.37
Radiation therapy		
No	402	36.05
Yes	713	63.95
Endocrine therapy at baseline		
No	280	25.36
Yes	824	74.64
Endocrine therapy at follow-up		
Never	280	26.02
Previous	502	46.65
Current	294	27.32
Chemotherapy		
No	771	69.65
Yes	336	30.35
Confidence in PCP's ability to manage survivorship care		
Not/A little confident	147	13.47
Somewhat confident	238	21.81
Very/Extremely confident	706	64.71
PCP continuity		
< 1 year	188	16.86
1–3 years	221	19.82
4–5 years	112	10.04
>5 years	594	53.27
Frequency of PCP visits		
0 times in the past 2 years	36	3.28
1–2 times	445	40.57
3–5 times	417	38.01
>5 times	199	18.14
Site		
Emory	590	52.17
USC	541	47.83

Table 2:

Multivariable-adjusted odds ratios (ORs) and 95% CIs comparing patient-reported survivorship care delivery by patient characteristics. Results using imputed data, average N=1150.

	PCP-led	Shared care	Oncologist-led
Age			
<40	Ref	Ref	Ref
40–49	Ref	1.84 (0.34–9.81)	0.71 (0.20–2.58)
50–59	Ref	1.40 (0.28–6.99)	0.63 (0.18–2.16)
60–69	Ref	1.01 (0.19–5.31)	0.63 (0.17–2.32)
70+	Ref	0.90 (0.16–4.96)	0.69 (0.18–2.65)
Race			
White	Ref	Ref	Ref
Black	Ref	1.14 (0.66–1.98)	0.90 (0.55–1.49)
Latina	Ref	0.62 (0.31–1.25)	0.93 (0.53–1.63)
Asian	Ref	0.88 (0.40–1.91)	0.96 (0.50–1.81)
Other	Ref	1.16 (0.28–4.83)	0.88 (0.25–3.10)
Education			
High school/GED or less	Ref	Ref	Ref
Some college	Ref	0.78 (0.43–1.40)	1.08 (0.66–1.78)
College graduate	Ref	0.87 (0.46–1.66)	1.22 (0.72–2.06)
Graduate deg or higher	Ref	1.42 (0.70–2.85)	1.68 (0.93–3.04)
Insurance			
None	Ref	2.29 (0.67–7.84)	0.90 (0.22–3.68)
Government (Medicaid, Medicare, VA)	Ref	1.03 (0.57–1.87)	1.33 (0.78–2.28)
Private/other	Ref	Ref	Ref
Comorbidities			
0	Ref	Ref	Ref
1	Ref	1.01 (0.51–1.99)	1.14 (0.66–1.96)
2+	Ref	1.27 (0.68–2.39)	1.31 (0.80–2.13)
Marital Status			
Married/Living with partner	Ref	Ref	Ref
Divorced/Separated/ Widowed/Never married	Ref	0.74 (0.47–1.17)	0.64 (0.43–0.95)

Models also adjusted for: SEER site, income, marital status, receipt of breast cancer treatment (surgery, radiation, chemotherapy, endocrine therapy at baseline, endocrine therapy at follow-up), rural/urban, continuity with PCP, and frequency of visits to PCP

Table 3:

Multivariable-adjusted differences in mean patient-reported PCP management of survivorship issues by patient characteristics. Results using imputed data, average N=1150.

	Estimate	SE	p-value
Age			
<40	Ref	Ref	Ref
40–49	0.76	1.58	0.63
50–59	1.41	1.54	0.36
60–69	0.31	1.61	0.85
70+	0.12	1.64	0.94
Race/Ethnicity			
White	Ref	Ref	Ref
Black	1.13	0.64	0.07
Latina	1.24	0.68	0.07
Asian	0.63	0.77	0.42
Other	−0.32	1.74	0.85
Education			
High school/GED or less	Ref	Ref	Ref
Some college	0.21	0.60	0.73
College graduate	−0.59	0.65	0.37
Graduate degree or higher	0.20	0.74	0.79
Insurance			
None	−0.72	1.65	0.66
Government (Medicaid, Medicare, VA)	0.31	0.67	0.64
Private/other	Ref	Ref	Ref
Comorbidities			
0	Ref	Ref	Ref
1	−0.26	0.69	0.70
2+	1.14	0.65	0.08

Models also adjusted for: SEER site, income, marital status receipt of breast cancer treatment (surgery, radiation, chemotherapy, endocrine therapy at baseline, endocrine therapy at follow-up), rural/urban, continuity with PCP, and frequency of visits to PCP

Table 4:

a) Patient-reported survivorship care delivery (weighted column %) by confidence in PCP ability to manage survivorship care				
	PCP-led	Shared care	Oncologist-led	p-value
PCP confidence				
Not/a little confident	25 (10.6)	21 (9.6)	95 (15.8)	0.01
Somewhat confident	52 (22.0)	37 (17.0)	141 (23.4)	
Very/extremely confident	159 (67.4)	160 (73.4)	366 (60.8)	

b) Patient-reported PCP management of survivorship issues (mean) by confidence in PCP ability to manage survivorship care			
	Mean	Mean 95% CI	p-value
PCP confidence			
Not/a little confident	6.84	5.95–7.73	<0.0001
Somewhat confident	9.24	8.57–9.90	
Very/extremely confident	13.31	12.78–13.84	