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Comorbid Condition Care Quality in Cancer Survivors: Role of Primary Care and Specialty Providers and Care Coordination

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Abstract

Purpose—To investigate provider specialty, care coordination, and cancer survivors' comorbid condition care.

Methods—This retrospective cross-sectional Surveillance, Epidemiology and End Results (SEER)-Medicare study included cancer survivors diagnosed in 2004, 2–3 years post-cancer-diagnosis, in fee-for-service Medicare. We examined (1) provider specialties (primary care [PCPs], oncology specialists, other specialists) visited post-hospitalization; (2) role of provider specialties in chronic and acute condition management; and (3) an ambulatory care coordination measure. Outcome measures covered (1) visits post-hospitalization for nine conditions; (2) chronic disease management (lipid profile, diabetic eye exam, diabetic monitoring); (3) acute condition management (electrocardiogram [EKG] for congestive heart failure [CHF], imaging for CHF, EKG for transient ischemic attack, cholecystectomy, hip fracture repair).

Results—Among 8661 cancer survivors, patients were more likely to visit PCPs than oncologists or other specialists following hospitalizations for 8/9 conditions. Patients visiting a PCP (vs. not) were more likely to receive recommended care for 3/3 chronic and 1/5 acute condition indicators. Patients visiting an other specialist (vs. not) were more likely to receive recommended care for 3/3 chronic and 2/5 acute condition indicators. Patients visiting an oncology specialist (vs. not) were

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more likely to receive recommended care on 2/3 chronic indicators and less likely to receive recommended care on 1/5 acute indicators. Patients at greatest risk for poor coordination were more likely to receive appropriate care on 4/6 indicators.

Conclusions—PCPs are central to cancer survivors' non-cancer comorbid condition care quality.

Implications for Cancer Survivors—PCP involvement in cancer survivors' care should be promoted.

Keywords

cancer survivorship; comorbidity; quality of care

INTRODUCTION

The estimated number of cancer survivors in the US is growing rapidly, from 10 million in 2001 to 12 million in 2007 and almost 14 million by 2012 [1–2]. These cancer survivors require surveillance for recurrence, general primary and preventive care, and often, care for comorbid conditions [3], as well as having psychosocial issues addressed [3–5]. Previous research investigating care in cancer survivors has consistently shown that patients visiting a primary care provider (PCP) are most likely to receive recommended preventive care [6–12]. A study in the UK suggests an important role for the “robust primary care system” in providing quality care in long-term cancer survivors [13]. Research has also shown that PCP visits are associated with recommended cancer surveillance [14]. However, approximately 20% of breast and colorectal cancer survivors did not see a PCP in the second year after their cancer diagnosis [8, 11]. Further, some cancer survivors do not recognize the value provided by a PCP's participation in their care [15–17].

The role of different provider specialties in comorbid condition care for cancer survivors is even more complex and has received less attention. Because cancer is particularly common in older individuals, with 60% of cancer survivors over age 65 [2], many cancer survivors also have comorbid conditions. In a population-based sample, 58% of cancer survivors had at least one comorbidity [18]. These comorbid conditions may have important implications for patient outcomes. Patients with certain early stage cancers (e.g., breast cancer) are more likely to die of causes other than cancer [19]. Further, the survival of breast cancer patients with comorbidity is equivalent to breast cancer patients with one stage worse disease without comorbidity (i.e., patients with stage 1 cancer with comorbidity survive at rates similar to patients with stage 2 cancer without comorbidity) [20].

The care for cancer survivors with multiple comorbid conditions is further complicated by the design of the US health care delivery system. In the US, the Medicare program is the insurer for individuals age 65 and over [21]. Traditionally, Medicare was a public insurer, which paid providers on a fee-for-service basis, covering basic health services, including inpatient care (Part A) and outpatient care (Part B, with an additional premium), subject to deductibles and co-insurance. Starting in 2006, outpatient prescription drug coverage was available (Part D), also with an additional premium through the traditional program.

Because traditional Medicare pays providers on a fee-for-service basis, there is no requirement for a primary care provider ‘gatekeeper’ or, until recently, any payment for care coordination. Medicare Advantage (Part C) is an alternative to the traditional program and provides coverage through private health maintenance organizations, preferred provider organizations, or fee-for-service insurance, and may include additional benefits. In 2004, 87% of Medicare beneficiaries were covered by traditional Medicare, but by 2010, this number had decreased to 76% [22].

Given the prevalence and importance of comorbid conditions for cancer survivors and the complexities of the US health care delivery system, research investigating the quality of care cancer survivors receive for their non-cancer conditions is critical. While previous investigations have demonstrated the PCP’s central role in preventive care for older cancer survivors in traditional Medicare fee-for-service, the role of the PCP in providing comorbid condition care for cancer survivors is less clear. Because survivors with comorbid conditions may be seeing both cancer specialists and other specialists, it is unknown whether PCPs’ involvement promotes quality comorbid condition care or simply adds another provider to the mix. Thus, we investigated the association between comorbid condition care quality indicators, involvement by different provider specialties, and risk of poor care coordination in cancer survivors.

METHODS

Study Design and Research Questions

Using published indicators [23] applied in previous studies [7], this retrospective cross-sectional study investigated the quality of acute and chronic comorbid condition care for survivors of breast, prostate, or colorectal cancer during Years 2–3 post-cancer diagnosis (assuming that cancer treatment would occur during Year 1). We investigated (1) which provider specialties cancer survivors visited after hospitalizations for nine different conditions: depression, diabetes, hypertension, gastrointestinal bleeding, transient ischemic attack (TIA), cerebrovascular accident (CVA), angina, myocardial infarction, and congestive heart failure (CHF); (2) the association between provider specialties visited and 3 chronic (lipid profile, diabetic eye exam, diabetic monitoring) and 5 acute (electrocardiogram [EKG] for CHF, imaging for CHF, EKG for TIA, cholecystectomy, hip fracture repair) comorbid condition quality indicators; and (3) the association between an ambulatory care coordination risk measure and the 6 ambulatory comorbid condition quality indicators. The first two sets of analyses were descriptive. For the third, we hypothesized that patients at greatest risk for poor coordination would be less likely to receive appropriate comorbid condition care. The Johns Hopkins School of Medicine Institutional Review Board deemed this analysis exempt.

Data Sources

We used the Surveillance, Epidemiology and End Results (SEER)-Medicare linked database [24], which links the SEER population-based cancer registries with Medicare claims. At the time of this study, SEER registries covered approximately 25% of the US population. For provider specialty, the unique provider identification numbers from the SEER-Medicare

dataset were linked with the American Medical Association (AMA) provider database by a third-party. For the care coordination risk measure, which uses Medicare specialty codes, we mapped the AMA physician specialty codes to the Medicare specialty codes.

Study Subjects

This analysis included cancer survivors diagnosed with loco-regional breast, prostate, or colorectal cancer in 2004 and followed through 2007. Survivors were 66 years old, survived 3 years, and continuously enrolled in fee-for-service Medicare (Parts A and B) from one year prior through three years following their cancer diagnosis. As noted above, in 2004, 87% of Medicare beneficiaries were covered by traditional fee-for-service Medicare [22]. Because we were interested in care for cancer survivors who had completed active treatment and had no evidence of disease, we excluded subjects who received chemotherapy, radiation, or hospice care during the survivorship period (i.e., Years 2–3 post-diagnosis).

Variables

Outcome Variables—The outcome variables were previously applied [7] indicators of quality comorbid condition care developed by RAND [23] (Box 1). We used two separate groups of indicators (see Study Design and Box 1). The first group of quality indicators addressed visits within specified time periods following discharge for patients who had been hospitalized for one of nine conditions. We examined incident hospitalizations during the survivorship period (Years 2–3). The second group of quality indicators addressed 3 care processes for chronic conditions and 5 care processes for acute conditions. For the three chronic condition indicators, we used the Medicare claims from Year 1 post-cancer-diagnosis to identify subjects with the relevant conditions who were therefore eligible for the process measures. For the acute care indicators, we examined incident events during Years 2–3 post-cancer-diagnosis.

Box 1

Quality Indicators [23]

Visits Following Hospitalizations

- Visit 2 weeks after discharge for patients hospitalized with depression
- Visit 4 weeks after discharge for patients hospitalized with diabetes
- Visit 4 weeks after discharge for patients hospitalized with malignant or otherwise severe hypertension
- Visit 4 weeks after discharge for patients hospitalized with gastrointestinal bleeding
- Visit 4 weeks after discharge for patients hospitalized with transient ischemic attack
- Visit 4 weeks after discharge for patients hospitalized with cerebrovascular accident
- Visit 4 weeks after discharge for patients hospitalized with unstable angina
- Visit 4 weeks after discharge for patients hospitalized with acute myocardial infarction
- Visit 4 weeks after discharge for patients hospitalized with congestive heart failure

Chronic Care Indicators

- Lipid profile 1 year after initial diagnosis of angina

- Eye examination every year for patients with diabetes
- Glycosylated hemoglobin or fructosamine every 6 months for patients with diabetes

Acute Care Indicators

- Electrocardiogram 3 months after initial diagnosis of congestive heart failure
- Chest radiograph 3 months after initial diagnosis of congestive heart failure
- Electrocardiogram within 2 days of initial diagnosis of transient ischemic attack
- Cholecystectomy (open or laparoscopic) for patients with cholelithiasis and 1 of the following: cholecystitis, cholangitis, gallstone pancreatitis^a
- Arthroplasty or internal fixation of hip during hospital stay for hip fracture^a

^aExcluded from the coordination risk measure analysis because the coordination risk measure is limited to ambulatory conditions.

Independent Variables—Physician specialty was categorized as PCP, oncology specialist, and other specialist, using the same categories applied in previous studies [6–11]. PCPs included specialties such as family medicine, internal medicine, and obstetrics/gynecology. Oncology specialists included specialties such as oncologists, hematologists, cancer surgeons, and general surgeons. All other specialty types were categorized as other specialists. We used three dichotomous variables to indicate visits to each provider category (yes/no). This categorization enabled us to compare, for example, care received by patients with PCP visits to care received by patients without PCP visits.

We also examined the association between chronic and acute care receipt and the Adjusted Clinical Groups[®] (ACG) Coordination Markers[™], which categorize the likelihood of ambulatory care coordination issues as Likely, Possible, or Unlikely [25]. The coordination risk measure factors in the number of unique providers, the number of specialties involved, the majority source of care visit percentage, and whether a generalist (PCP, physician assistant, or nurse practitioner) was seen. Patients with more unique providers, more specialties involved, lower percentage of care from the majority source, and no generalist visit are considered to be at greater risk for coordination issues. Only evaluation and management visits with providers who could be involved in the overall management of the patient's care are counted. The coordination risk measure has demonstrated validity, with greater coordination risk associated with higher costs and higher rates of asthma emergency department visits [25].

Covariates—Multivariable models included age 75+ (vs. <75), race (non-white vs. white), cancer type (breast or prostate vs. colorectal), urban residence (vs. rural), state buy-in participation (vs. not), and pre-cancer-diagnosis comorbidity score 1+ (vs. 0) [26–28]. State buy-in reflects whether a Medicare beneficiary's state was responsible for paying the Part B premium, thus providing an indication of socio-economic status. The categorical pre-cancer-diagnosis comorbidity score grouped patients into those with a comorbidity score of 0 versus 1 or greater. Eligibility for given quality indicators was determined using the specific criteria from the published quality indicators [23].

Analyses

After describing the sample characteristics, we performed three sets of analyses. First, we examined which provider specialties (PCP, oncology specialist, other specialist) patients visited following hospitalization for nine conditions. We included all physician specialties visited during the post-discharge period specified by the indicator (4 weeks for all, except 2 weeks for depression), so patients may be counted as having visits in multiple provider categories.

Second, we used logistic regression, adjusting for the covariates, to examine whether visits to the three provider specialties were associated with receipt of quality comorbid condition care. We developed separate models for each of the 8 quality indicators (3 chronic and 5 acute).

Third, we used logistic regression, adjusting for the covariates, to examine the association between the 3 chronic and 3 of the 5 acute care indicators and the care coordination risk measure. Two acute care indicators related to inpatient care (cholecystectomy and hip fracture repair) were not included in these analyses as the coordination risk measure addresses ambulatory care. Analyses used SAS 9.1.3.

RESULTS

The sample included 8661 cancer survivors, mean age 75 years, 65% male, and 85% White (Table 1). The majority of the sample had survived prostate cancer (53%), with 22% surviving breast cancer, and 26% colorectal cancer. The vast majority (90%) resided in an urban setting, and 10% ever participated in state buy-in (indicating lower socioeconomic status).

The analysis of provider specialties visited after hospitalizations found substantial PCP involvement (Figure 1). For 8 of 9 conditions, patients were most likely to visit a PCP, ranging from 67% for acute myocardial infarction (tying other specialists) to 85% for malignant/severe hypertension. The only condition for which patients were not most likely to see a PCP was unstable angina (39% visiting PCP vs. 85% visiting other specialists). Oncology specialists were infrequently visited following hospitalizations for these non-cancer conditions (<22% of patients).

The second analysis examined the association between provider specialties visited and 3 chronic and 5 acute quality indicators (Figure 2a). Compared to patients who did not visit other specialists, patients with other specialist visits were more likely to receive recommended care on all three chronic and two acute (EKG for CHF, chest imaging for CHF) indicators. Compared to patients who did not visit PCPs, patients with PCP visits were more likely to receive recommended care on all chronic and one acute (chest imaging for CHF) indicators. Compared to patients who did not visit oncology specialists, patients with oncology specialist visits were more likely to receive recommended care on two chronic (diabetic eye exam, diabetes monitoring) but less likely to receive recommended care on one acute (EKG for TIA) indicators. No other associations between the quality indicators and provider specialty visited were statistically significant.

The third analysis examined the association between the care coordination risk measure and the three chronic condition indicators and three acute condition indicators focused on ambulatory care (Figure 2b). Compared to patients with an unlikely coordination risk, patients with a likely coordination risk were more likely to receive recommended care on four indicators (lipid profile, diabetic eye exam, diabetic monitoring, EKG for CHF) and patients with a possible coordination risk were more likely to receive recommended care on diabetic eye exam. The findings did not support our hypothesis that patients with a greater coordination risk would be less likely to receive recommended care.

To explore this unexpected finding, we repeated the models using the individual components of the coordination risk measure. Specifically, we used logistic regression models with performance on each indicator (yes/no) as a function of unique provider count (1, 2–6, 7+, other [meaning no visits to an eligible provider]), specialty count (<5 or ≥5), majority source of care (<28% or ≥28%), and generalist seen (yes/no) while adjusting for the same covariates. These post-hoc analyses demonstrated that having more unique providers was consistently associated with more appropriate care based on the indicators (Table 2). For example, compared to patients with 1 unique provider, patients with 7 or more unique providers were more likely to receive recommended care on four indicators (diabetic eye exam, diabetic monitoring, EKG for CHF, chest imaging for CHF). Because the coordination risk measure considers more unique providers to be a higher coordination risk and because the post-hoc analysis demonstrated that more unique providers was associated with more appropriate comorbid condition care, the findings contradicted our initial hypothesis that patients at greater coordination risk would be less likely to receive recommended care.

DISCUSSION

Many cancer survivors have comorbid conditions, but there has been little research investigating the quality of comorbid condition care they receive. Earle & Neville [7] examined comorbid condition care quality in five-year colorectal cancer survivors diagnosed in 1991–1992 and found that having both a PCP and oncology specialist involved in the survivor's care was associated with higher quality. Our study builds on this previous research by investigating care in survivors of three different cancer types, using more recent data, and focusing on the critical period when cancer treatment is ending and patients are transitioning to survivorship. We not only examined which provider specialties are involved in care but also investigated a coordination risk measure.

There were two key findings from this research. First, in addition to the expected importance of other specialists' involvement in cancer survivors' comorbid condition care, PCPs also played a pivotal role. PCP and other specialist visits were associated with all three indicators of chronic comorbid condition care and one (chest imaging for CHF) and two (EKG for CHF, chest imaging for CHF) indicators of acute condition care, respectively. That the statistically significant findings were all in the same direction (and the non-significant estimates tended to follow this trend) suggests that these associations are not the result of random variation. Further, on almost all of the post-hospitalization visit indicators, patients were most likely to see a PCP. In contrast, the results regarding oncology specialists'

involvement were less consistent, suggesting no association with comorbid condition care quality. While it may be unsurprising that these non-cancer condition-specific indicators may not be addressed by oncologists, a previous study demonstrated that, for 21% of oncology patients, oncologists are providing more non-cancer-related care than cancer-related care [29]. Taken together, these findings suggest that certain specialty types may play important roles in specific areas but PCPs are critical across chronic and post-hospitalization comorbid condition care. Given that previous research has found differences in comorbid condition care quality by the type of cancer survived [30], interventions that promote PCP involvement in survivors' follow-up care may be effective.

The second important finding from this research is the relationship between the care coordination risk measure and the quality indicators. While one might expect a higher risk of poor coordination to be associated with worse comorbid condition care, in this analysis, higher risk of poor coordination was associated with more appropriate care. This finding was explained by the role of the unique provider count. Patients with more unique providers and likely risk for coordination issues were more likely to receive recommended care. Upon closer examination, this finding is explained by the fact that several of the quality indicators used in this analysis require more unique providers to be involved (e.g., eye exam for diabetics). This would explain why patients assigned to the likely coordination risk group would be more, rather than less, likely to receive appropriate care. It is also possible that the severity of the comorbid condition could be confounding the association. Another consideration is that we used the same study period to assign patients to coordination risk category and to evaluate the quality indicators. A prospective analysis in which the coordination risk category is assigned based on claims prior to the study period may be more effective.

Notably, the measure used in our analysis to assess coordination of care is described as a metric of risk for poorly coordinated care. It was validated using cost and asthma emergency department visits [25]. Because cancer survivors with comorbid conditions may have a complex array of providers involved in their care, the motivation for this analysis was to explore whether coordination risk was associated with recommended care receipt. For the reasons described above, it did not perform effectively for this purpose. Alternative metrics that assess care coordination – rather than coordination risk – are needed to provide a more complete evaluation of care quality. As defined by McDonald et al., care coordination is “the deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient’s care to facilitate the appropriate delivery of health care services” [31 p.41]. Because our analysis relied on claims data, we could only assess “the appropriate delivery of health care services” -- not the more complex aspects of coordination such as whether there was a “deliberate organization” of care. Supplementing these claims-based process measures by surveying patients and providers would provide a more complete picture of care coordination. Given the challenges of measuring care coordination, future research would benefit from developing improved metrics of care coordination and from using multiple metrics (e.g., patient and provider surveys and claims data) simultaneously.

The study's limitations also inform interpretation of the findings. SEER-Medicare only includes the population over age 65 in fee-for-service Medicare. Although these quality indicators were developed specifically for use with claims data [23], claims analysis only captures whether covered services were billed to Medicare -- not why services were or were not provided. Further, these quality indicators are limited to selected process-of-care measures and do not address the important psychosocial elements of survivorship care. Notably, based on the categorical comorbidity score, 29% of our sample had at least one comorbidity. This claims-based estimate is not directly comparable to the 58% estimate based on self-report from the population-based sample of cancer survivors [18] because (1) it was assessed based on claims data prior to the cancer diagnosis to estimate pre-cancer comorbidity burden, rather than in cancer survivors and (2) used a different approach to measure comorbidity [32]. As noted in the Methods, eligibility for given comorbid condition quality indicators was determined using the specific criteria from the published quality indicators [23], not from the comorbidity score reported in Table 1. Further, our sample might represent a healthier population because it only included subjects who survived a full three years following their cancer diagnosis. Examination of care quality among survivors who died during follow-up would be informative but confounds the determination of eligibility for the quality indicators.

Despite these limitations, this analysis addresses the important issue of comorbid condition care in cancer survivors. SEER-Medicare enables analysis of a large population-based sample from geographically diverse regions of the US. That we used the AMA provider file to determine physician specialty is another strength, as the data in the AMA file contain more detail regarding provider specialty. These findings support the critical role of PCPs in providing comorbid condition care even for complex cancer survivors.

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Figure 1.

Percentage of patients visiting each of the three provider specialty types (primary care providers [PCPs], other specialists, and oncology specialists) following hospitalization for 9 different conditions. Time period for the visits is 4 weeks from discharge for all but the depression indicator, which is 2 weeks from discharge. (HTN=hypertension, GI=gastrointestinal, TIA=transient ischemic attack, CVA=cerebrovascular accident, AMI=acute myocardial infarction, CHF=congestive heart failure)

Figure 2(a):

Figure 2(b):

Figure 2.

(a) Odds ratios and 95% confidence intervals for the association between physician specialties visited and comorbid condition quality indicators. Odds ratios greater than 1.0 indicate greater odds of recommended care receipt compared to no visit to the provider type.

(b) Odds ratios and 95% confidence intervals for the association between the coordination risk measure and comorbid condition quality indicators. Odds ratios greater than 1.0 indicate greater odds of recommended care receipt compared to the reference group (unlikely coordination risk). Chronic condition indicators are denoted with diamonds; acute condition indicators are denoted with squares. Models are adjusted for age (75+ vs. <75), race (Non-white vs. White), cancer type, comorbidity score (1+ vs 0), state buy-in, and urban residence (vs. rural). (EKG=electrocardiogram, CHF=congestive heart failure, TIA=transient ischemic attack)

Table 1

Sample Characteristics

Characteristic	Cases Overall (n=8661)	Colorectal Cases (n=2231)	Breast Cases (n=1871)	Prostate Cases (n=4559)
Age				
Mean (SD)	74.8 (6.55)	77.2 (7.02)	76.9 (7.16)	72.8 (5.25)
Sex n(%)				
Male	5614 (64.8)	1055 (47.3)	0 (0.0)	4559 (100.0)
Race n(%)				
White	7330 (84.6)	1926 (86.3)	1656 (88.5)	3748 (82.2)
Black	721 (8.3)	149 (6.7)	113 (6.0)	459 (10.1)
Other	610 (7.0)	156 (7.0)	102 (5.5)	352 (7.7)
Comorbidity Score n(%)^a				
0	6114 (70.6)	1376 (61.7)	1306 (69.8)	3432(75.3)
1+	2547 (29.4)	855 (38.3)	565 (30.2)	1127(24.7)
Ever in State Buy-In n(%)^b				
Yes	883 (10.2)	280 (12.6)	245 (13.1)	358 (7.9)
Urban/Rural Residence n(%)				
Urban	7824 (90.3)	1963 (88.0)	1679 (89.7)	4182 (91.7)
SEER Region n(%)				
Connecticut	621 (7.2)	179 (8.0)	171 (9.1)	271 (5.9)
Detroit	586 (6.8)	156 (7.0)	112 (6.0)	318 (7.0)
Hawaii	131 (1.5)	37 (1.7)	19 (1.0)	75 (1.7)
Iowa	620 (7.2)	229 (10.3)	163 (8.7)	228 (5.0)
New Mexico	215 (2.5)	54 (2.4)	41(2.2)	120 (2.6)
Seattle	633 (7.3)	119 (5.3)	130 (7.0)	384 (8.4)
Utah	356 (4.1)	62 (2.8)	56 (3.0)	238 (5.2)
Atlanta & Rural Georgia	233 (2.7)	43 (1.9)	50 (2.7)	140 (3.1)
California ^c	2905 (33.5)	662 (29.7)	581 (31.1)	1662 (36.5)
Kentucky	579 (6.7)	177 (7.9)	138 (7.4)	264 (5.8)
Louisiana	572 (6.6)	118 (5.3)	137 (7.3)	317 (7.0)
New Jersey	1210 (14.0)	395 (17.7)	273 (14.6)	542 (11.9)

^aThe pre-cancer-diagnosis categorical comorbidity score grouped patients into those with a comorbidity score of 0 versus 1 or greater.

^bState buy-in reflects whether a Medicare beneficiary's state was responsible for paying the beneficiary's Part B premium, and thus provides an indication of socio-economic status.

^cIncluding Greater California, San Francisco, San Jose, and Los Angeles registries.

Table 2

Post-Hoc Analyses of the Association between the Care Coordination Risk Measure Individual Components and Comorbid Condition Quality Indicators

Quality Indicator	Odds Ratios (95% Confidence Intervals) ^a						Generalist Seen (Y vs. N)
	Unique Provider Count 2-6 (vs. 7)	Unique Provider Count 1 (vs. 7)	Unique Provider Count Other (vs. 7)	Specialty Count 5 (vs. <5)	Majority Source of Care>28% (vs. 28%)		
Lipid Profile	0.77 (0.37, 1.63)	0.46 (0.16, 1.30)	0.30 (0.05, 1.75)	1.38 (0.70, 2.72)	0.67 (0.25, 1.76)		2.91 (1.62, 5.21)
Eye Exam for Diabetes	0.86 (0.63, 1.18)	0.31 (0.19, 0.52)	0.21 (0.10, 0.46)	1.57 (1.20, 2.05)	0.96 (0.65, 1.43)		0.94 (0.70, 1.27)
Diabetic Monitoring	0.82 (0.58, 1.16)	0.42 (0.23, 0.77)	0.42 (0.16, 1.13)	1.27 (0.94, 1.72)	1.48 (0.95, 2.31)		1.18 (0.83, 1.69)
EKG for CHF	0.90 (0.60, 1.35)	0.48 (0.25, 0.92)	0.48 (0.20, 1.15)	1.09 (0.74, 1.59)	0.70 (0.43, 1.15)		1.17 (0.79, 1.73)
Chest Imaging for CHF	0.63 (0.42, 0.96)	0.42 (0.22, 0.82)	0.55 (0.23, 1.31)	0.65 (0.44, 0.96)	0.74 (0.46, 1.20)		1.24 (0.83, 1.84)
EKG for TIA	0.89 (0.44, 1.78)	1.40 (0.37, 5.29)	1.79 (0.28, 11.55)	0.79 (0.42, 1.50)	1.16 (0.52, 2.59)		2.17 (0.92, 5.13)

^a Logistic regression models with performance on each indicator (yes/no) as a function of unique provider count (1, 2-6, 7+, other [meaning no visits to an eligible provider]), specialty count (<5 or ≥5), majority source of care (<28% or ≥28%), and generalist seen (yes or no) while adjusting for age (75+ vs. <75), race (Non-white vs. White), cancer type, comorbidity score (1+ vs 0), state buy-in, and urban residence (vs. rural)

EKG=electrocardiogram, CHF=congestive heart failure, TIA=transient ischemic attack

BOLD=p<0.05