The National Cancer Institute Community Cancer Centers Program (NCCCP): Sustaining Quality and Reducing Disparities in Guideline-Concordant Breast and Colon Cancer Care

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ABSTRACT

Background. The National Cancer Institute Community Cancer Centers Program (NCCCP) pilot was designed to improve quality of care and reduce disparities at community hospitals. The NCCCP’s primary intervention was the implementation of the Commission on Cancer Rapid Quality Reporting System (RQRS). The RQRS is a hospital-based data collection and evaluation system allowing near real-time assessment of selected breast and colon cancer quality of care measures. Building on previous NCCCP analyses, this study examined whether improvements in quality cancer care within NCCCP hospitals early in the program were sustained and whether improvements were notable for minority or underserved populations.

Methods. We compared changes in concordance with three breast and two colon cancer quality measures approved by the National Quality Forum for patients diagnosed at NCCCP hospitals from 2006 to 2007 (pre-RQRS), 2008 to 2010 (early-RQRS), and 2011 to 2013 (later-RQRS). Data were obtained from NCCCP sites participating in the Commission on Cancer Rapid Quality Reporting System. Logistic regression analyses were performed to identify predictors of concordance with breast and colon cancer quality measures.

Results. The sample included 13,893 breast and 5,546 colon cancer patients. After RQRS initiation, all five quality measures improved significantly and improvements were sustained through 2013. Quality of care measures showed sustained improvements for both breast and colon cancer patients and for vulnerable patient subgroups including black, uninsured, and Medicaid-covered patients.

Conclusion. Quality improvements in NCCCP hospitals were sustained throughout the duration of the program, both overall and among minority and underserved patients. Because many individuals receive cancer treatment at community hospitals, facilitating high-quality care in these environments must be a priority. The Oncologist 2017;22:910–917

Implications for Practice: Quality improvement programs often improve practice, but the methods are not maintained over time. The implementation of a real-time quality reporting system and a network focused on improving quality of care sustained quality improvement at select community cancer centers. The NCCCP pilot increased numbers of patients receiving guideline-concordant care for breast and colon cancer in community settings, and initial improvements noted in earlier years of RQRS were sustained into later years, both overall and among minority and underserved patients. National initiatives that improve care for diverse patient groups are important for reducing and eliminating barriers to care.

INTRODUCTION

In 2007, the National Cancer Institute (NCI) funded the NCI Community Cancer Centers Program (NCCCP) pilot, an initiative at hospital-based community cancer centers designed to help build a community-based research platform with the goals of improving quality of care, reducing cancer disparities, and increasing participation in clinical trials. As the NCCCP sites developed over time, they began to function as a network, collaborating to improve patient care, share best practices, and develop new tools to achieve program goals [1]. The NCCCP implemented an intervention that involved sites participating in the Commission on Cancer (CoC) Rapid Quality Reporting System (RQRS). The RQRS is a hospital-based data collection...
and evaluation system allowing near real-time assessment of selected breast and colon cancer quality of care measures [2]. The RQRS began as a pilot with a few sites testing a beta version of the dashboard. In 2008, the official dashboard was released and participation expanded to include CoC-accredited hospitals.

Previous studies have examined the impact of the NCCCP program on quality of cancer care. A comprehensive, multimeethod evaluation of the NCCCP was performed, and one component of the evaluation focused on how participation in the NCCCP changed the quality of cancer care provided at these hospitals before versus after NCCCP initiation between 2007 and 2010 [3]. The study showed that NCCCP sites had significant improvements in quality of care for a subset of measures. In a follow-up study, Halpern and Spain et al. examined the effects of the NCCCP pilot on quality of care for patients from underserved populations during the same period and found that while quality of care improvements were similar for all patients, the percent of patients with guideline-concordant care was lower among certain underserved patient groups [4].

The aims of the current study were twofold. First, we built on analyses performed as part of the original comprehensive NCCCP evaluation, going through 2010, and examined whether improvements in quality of care have been sustained through 2013. Second, because reduction in cancer disparities was an NCCCP goal, we assessed whether sustained quality changes were observed among underserved populations. Specifically, this research addressed the following research questions: (a) have improvements in concordance rates with the five quality of care measures been sustained since 2010 and (b) how does the change in concordance for minority/underserved patients compare to the change for nonminority/nonunderserved patients through 2013?

**Materials and Methods**

**Data and Analytic Sample**

Analyses were performed using data from the RQRS [2]. The RQRS was designed to improve the timeliness and reporting of National Quality Forum (NQF)-endorsed quality indicators and to provide a platform for quality improvement based on those measures [1]. Participating NCCCP sites uploaded RQRS data to a secure server on a monthly basis as an NCCCP-quality reporting deliverable. Details on the NCCCP and the RQRS have been previously published [3–5].

The study sample consisted of 19,439 patients diagnosed with breast or colon cancer between 2006 and 2013 at 12 NCCCP sites [2]. Patients diagnosed in 2006 or 2007 are considered to have been diagnosed “pre-RQRS” initiation, those diagnosed between 2008 and 2010 are classified as having been diagnosed “early RQRS,” and those diagnosed between 2011 and 2013 are classified as “late RQRS.”

**Measures**

The study examined changes over time in the following breast and colon cancer measures that were endorsed by the National Quality Forum (NQF) and CoC and were included in the RQRS initiated by the National Cancer Institute [3]:

- Breast-breast-conserving surgery (BCS): Radiation therapy administered within 1 year of diagnosis for females under age 70 receiving BCS for breast cancer.
- Breast-hormone therapy (HT): Tamoxifen or third generation aromatase inhibitor considered or administered within 1 year of diagnosis for females with American Joint Committee on Cancer (AJCC) T1cN0M0, or stage II or III hormone-receptor-positive breast cancer.
- Breast-multi-agent chemotherapy (MAC): Combination (multi-agent) chemotherapy considered or administered within 4 months of diagnosis for females under 70 with AJCC T1cN0M0 or stage II or III hormone-receptor-negative breast cancer.
- Colon-adjuvant chemotherapy (ACT): Adjuvant chemotherapy considered or administered within 4 months of diagnosis for patients under age 80 with AJCC stage III colon cancer.
- Colon-12RLN: At least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer.

**Analyses**

All analyses were performed using Stata version 13 [6]. We examined concordance rates for the five quality of care measures separately across three time periods: pre-RQRS (2006–2007), early RQRS (2008–2010), and later RQRS (2011–2013) (Tables 1 and 2). For each quality measure, we examined concordance rates overall and separately by patient characteristics. We performed logistic regression models to identify predictors of concordance with breast and colon cancer quality measures. Since NCCCP sites are heterogeneous in terms of urban/rural status, data management, infrastructure, and funding source [7], we accounted for intragroup correlation within community hospitals using Stata’s cluster option. We performed logistic regression models for the main effects of RQRS time period and patient characteristics for each quality measure (Model 1 in Table 3). To assess whether the likelihood of sustained concordance with quality measures differed among patient subgroups, we also performed logistic regression models for interaction effects between RQRS time period and patient characteristics, including patient race (Model 2 in Table 3), patient sex (for colon cancer only); patient primary insurance (Medicare, Medicaid, private insurance, other insurance, or uninsured); and patient age group (categorized as <50, 50–59, 60–69, and 70 and older). Cases were included in the analysis if they received all or part of their treatment at an NCCCP site.

**Results**

**Patient Sample**

The breast cancer sample included 13,893 patients, 25% diagnosed during the pre-RQRS time period, 45% from the early
RQRS time period, and 30% from the later RQRS time period (Table 1). Of the breast cancer patients, 87% were white. Insurance groups for females with breast cancer included 25% with Medicare, 6% with Medicaid, 50% with private insurance, 17% with other insurance, and 2% uninsured. Age groups included 26% younger than 50 years of age, 32% 50–59 years, 30– 60– 69 years, and 12% 70 years of age and older. See supplemental online Table 1 for patient characteristics by breast and colon cancer quality measures.

The colon cancer sample included 5,546 patients; 27% from the pre-RQRS time period, 42% from the early RQRS time period, and 31% from the later RQRS time period (Table 2). The sample of colon cancer patients was approximately evenly split between males and females. Of the colon cancer sample, 85% were white. Insurance groups for patients with colon cancer included 56% Medicare, 3% Medicaid, 27% private insurance, 12% with other insurance, and 3 percent uninsured. Age groups included 10% younger than 50 years of age, 19% 50–59 years, 25% 60–69 years, and 46% 70 years of age and older.

Sustained Concordance with Quality of Care Measures

Across the entire study period, females with “other” insurance were significantly less likely to receive guideline-concordant radiation therapy following breast-conserving surgery compared with females with private insurance (Model 1 in Table 3; odds ratio \( OR = 0.70, 95\% \) confidence interval \( CI [0.57, 0.86] \)). However, during the early and later RQRS time periods, females with other insurance no longer had disparities in concordance with radiation therapy (Fig. 1). Across the entire study period, nonwhite females and females with other insurance were significantly less likely to...
| Table 1. Concordance rates percentage, (95% CI): pre-RQRS, early RQRS, and later RQRS: breast cancer quality measures, by patient characteristics |
|---|
| **Breast Cancer: BCS** |
| *(n = 5,485)* |
| **Time period** | **Pre-RQRS (n = 1,506)** | **Early RQRS (n = 2,424)** | **Later RQRS (n = 1,555)** |
| Overall | 78.6 (76.5–80.7) | 92.8 (91.7–93.8) | 92.3 (90.9–93.6) |
| **Breast Cancer: HT** |
| *(n = 7,049)* |
| **Time period** | **Pre-RQRS (n = 1,576)** | **Early RQRS (n = 3,261)** | **Later RQRS (n = 2,212)** |
| Overall | 58.2 (55.8–60.7) | 89.4 (88.3–90.4) | 91.7 (90.5–92.8) |
| **Breast Cancer: MAC** |
| *(n = 1,359)* |
| **Time period** | **Pre-RQRS (n = 331)** | **Early RQRS (n = 593)** | **Later RQRS (n = 435)** |
| Overall | 85.2 (80.9–88.8) | 92.4 (90.0–94.4) | 92.6 (89.8–94.9) |

**Patient race**

| **Race** | **Pre-RQRS (n = 1,506)** | **Early RQRS (n = 2,424)** | **Later RQRS (n = 1,555)** |
| White | 79.6 (77.4–81.8) | 93.3 (92.1–94.3) | 92.3 (90.8–93.7) |
| Nonwhite | 72.3 (65.1–78.8) | 90.0 (86.3–92.9) | 92.7 (88.6–95.7) |

**Primary patient insurance**

| **Insurance** | **Pre-RQRS (n = 1,506)** | **Early RQRS (n = 2,424)** | **Later RQRS (n = 1,555)** |
| Medicare | 77.3 (71.7–82.3) | 92.5 (89.4–94.9) | 93.2 (89.6–95.9) |
| Medicaid | 67.9 (54.0–79.7) | 91.9 (86.3–95.7) | 91.1 (83.2–96.1) |
| Private insurance | 81.1 (78.1–83.8) | 93.7 (92.2–94.9) | 93.7 (90.2–95.2) |
| Other insurance | 77.5 (73.0–81.5) | 91.6 (88.5–94.1) | 86.0 (80.5–90.4) |
| Uninsured | 68.8 (50.0–83.9) | 89.6 (77.3–96.5) | 88.9 (65.3–98.6) |

**Patient age group**

| **Age group** | **Pre-RQRS (n = 1,506)** | **Early RQRS (n = 2,424)** | **Later RQRS (n = 1,555)** |
| <50 | 77.7 (73.4–81.6) | 92.9 (90.6–94.8) | 89.3 (85.6–92.3) |
| 50–59 | 79.3 (75.8–82.5) | 93.1 (91.3–94.7) | 92.6 (90.2–94.6) |
| 60–69 | 78.6 (74.8–82.2) | 92.4 (90.5–94.1) | 93.8 (91.6–95.6) |
| 70+ | N/A | N/A | N/A |

*Early RQRS includes patients diagnosed between 2008 and 2010. Later RQRS includes patients diagnosed between 2011 and 2013. Abbreviations: BCS, breast-conserving surgery; CI, confidence interval; HT, hormone therapy; MAC, multi-agent chemotherapy; N/A, not available; RQRS, Rapid Quality Reporting System.*
Table 2. Concordance rates percentage (95% CI): pre-RQRS, early RQRS, and later RQRS: colon cancer quality measures, by patient characteristics

| Time period          | Colon cancer: ACT Adjuvant Chemotherapy (n = 1,206) | Colon cancer: 12RLN 12 regional lymph nodes examined (n = 4,340) |
|----------------------|---------------------------------------------------|-------------------------------------------------|
|                      | Pre-RQRS (n = 311) | Early RQRS (n = 519) | Later RQRS (n = 376) | Pre-RQRS (n = 1,203) | Early RQRS (n = 1,811) | Later RQRS (n = 1,326) |
| Overall              | 72.0 (66.7–76.9) | 91.3 (88.6–93.6) | 89.6 (86.1–92.5) | 77.1 (74.7–79.5) | 89.1 (87.5–90.5) | 90.0 (88.2–91.5) |
| Patient race         |                     |                     |                     |                     |                     |                     |
| White                | 71.1 (65.2–76.5) | 91.9 (88.9–94.3) | 90.9 (87.1–93.9) | 77.1 (74.4–79.6) | 89.3 (87.7–90.8) | 90.7 (88.8–92.3) |
| Nonwhite             | 76.6 (62.0–87.7) | 89.4 (80.8–95.0) | 83.8 (72.9–91.6) | 79.1 (71.6–85.3) | 87.4 (82.8–91.1) | 86.0 (80.5–90.4) |
| Patient sex          |                     |                     |                     |                     |                     |                     |
| Male                 | 69.6 (61.8–76.6) | 88.8 (84.5–92.3) | 88.0 (82.9–92.0) | 75.5 (71.8–78.9) | 88 (85.6–90.1) | 90.3 (87.7–92.4) |
| Female               | 74.7 (66.9–81.4) | 94.0 (90.3–96.6) | 91.8 (86.4–95.6) | 78.8 (75.3–82.0) | 90.1 (88.0–91.9) | 89.7 (87.1–91.9) |
| Primary patient insurance |               |                     |                     |                     |                     |                     |
| Medicare             | 75.6 (67.3–82.7) | 87.7 (82.8–91.6) | 91.5 (85.9–95.4) | 75.0 (71.8–78.1) | 89.1 (87.1–90.9) | 89.1 (86.7–91.3) |
| Medicaid             | 40.0 (5.3–85.3) | 85.7 (63.7–97.0) | 86.7 (59.5–98.3) | 82.4 (56.6–96.2) | 91.1 (78.8–97.5) | 97 (84.2–99.9) |
| Private Insurance    | 68.8 (58.5–77.8) | 93.9 (89.0–97.0) | 89.7 (83.6–94.1) | 81.7 (76.3–86.3) | 89.5 (86.2–92.2) | 90.4 (87.0–93.1) |
| Other Insurance      | 71.9 (58.5–83.0) | 97.5 (91.4–99.7) | 82.5 (67.2–92.7) | 80.0 (73.0–85.9) | 88.0 (83.2–91.9) | 92.4 (85.5–96.7) |
| Uninsured            | 70.6 (44.0–89.7) | 91.7 (61.5–99.8) | 94.1 (71.3–99.9) | 72.4 (52.8–87.3) | 88.2 (72.5–96.7) | 87.9 (71.8–96.6) |
| Patient age group    |                     |                     |                     |                     |                     |                     |
| <50                  | 74.4 (58.8–86.5) | 97.4 (90.9–99.7) | 92.7 (82.4–98.0) | 83.9 (74.5–90.9) | 92.5 (87.3–96.1) | 90.5 (83.2–95.3) |
| 50–59                | 68.1 (55.8–78.8) | 94.7 (89.3–97.8) | 90.7 (83.6–95.5) | 79.2 (72.7–84.7) | 87 (82.8–90.5) | 93.1 (89.1–95.9) |
| 60–69                | 75.6 (65.1–84.2) | 89.8 (84.0–94.1) | 83.3 (74.9–89.8) | 77.9 (72.5–82.7) | 89.7 (86.4–92.4) | 87.2 (83.1–90.6) |
| 70+                  | 70.8 (61.5–79.0) | 87.0 (80.7–91.9) | 93.3 (86.7–97.3) | 75.3 (71.8–78.6) | 88.9 (86.7–90.9) | 90.1 (87.5–92.3) |

*Early RQRS includes patients diagnosed between 2008 and 2010. Later RQRS includes patients diagnosed between 2011 and 2013. Overall RQRS combines the early RQRS and later RQRS periods, and includes patients diagnosed between 2008 and 2013.

Abbreviations: 12RLN, regional lymph nodes; ACT, adjuvant chemotherapy; CI, confidence interval; RQRS, Rapid Quality Reporting System.

receive guideline-concordant hormone therapy compared to white females and females with private insurance (Model 1 in Table 3; nonwhite compared to white: OR = 0.65, 95% CI [0.51, 0.82]; other Insurance compared to Private Insurance: OR = 0.71, 95% CI [0.54, 0.94]). These disparities were not statistically significant during the early and later RQRS periods (interaction terms not significant in Model 2 in Table 3 and in Fig. 1). However, uninsured females were significantly less likely to receive guideline-concordant hormone therapy during both the early and later RQRS time periods (Fig. 1; early RQRS: OR = 0.28, 95% CI [0.10, 0.74]; later RQRS: OR = 0.10, 95% CI [0.02, 0.61]). This suggests that, as the concordance rate for the Breast-HT measure increased from the pre-RQRS period to the early and later RQRS periods, the rate among uninsured women did not increase as rapidly.

Across the entire study period, Medicaid-enrolled females were significantly less likely to receive guideline-concordant multi-agent chemotherapy (MAC) for breast cancer compared to females with private insurance (Model 1 in Table 3; OR = 0.50, 95% CI [0.29, 0.87]), and females 50–59 years of age were significantly less likely to receive guideline-concordant MAC compared to females who were younger than age 50 (Model 1 in Table 3; OR = 0.67, 95% CI [0.51, 0.87]). During the early and later RQRS time periods, Medicaid-enrolled females and females who were 50–59 years of age no longer had disparities in concordance with chemotherapy for breast cancer (interaction terms not significant in Figs. 1 and 2). However, during the early RQRS time period, Medicare-enrolled females were significantly more likely to receive guideline-concordant MAC (Fig. 1; OR = 1.08, 95% CI [0.25, 4.61]), while females with other insurance were significantly less likely to receive guideline-concordant MAC (Fig. 1; OR = 0.36, 95% CI [0.13, 1.00]).

### Concordance with Colon Cancer Measures by Patient Sociodemographic Characteristics

Across the entire study period, patients 60 or more years of age were significantly less likely to receive guideline-
Table 3. Odds ratios (95% CI) from multivariable regression analyses of the likelihood of concordance with breast and colon cancer quality measures

| Models          | Variables          | Breast Cancer | Colon Cancer |
|-----------------|--------------------|---------------|--------------|
|                 | Quality measure:   | Quality measure: | Quality measure: |
|                 | BCSab( n = 5,381)  | HTb(n = 6,904) | MACac(n = 1,312) |
|                 | OR (CI)            | OR (CI)       | OR (CI)      |
| Model 1:       | Early RQRS         | 3.46a         | 6.03a         | 2.53a         | 4.25a         | 2.37a         |
| Main Effects    | (ref: Pre-RQRS)    | (2.53–4.72)   | (4.73–7.69)   | (1.57–4.08)   | (2.33–7.75)   | (1.51–3.72)   |
|                 | Later RQRS         | 3.16d         | 8.02d         | 2.44f         | 3.64d         | 2.60d         |
|                 | (ref: Pre-RQRS)    | (2.11–4.72)   | (5.19–12.40)  | (1.22–4.90)   | (1.69–7.84)   | (1.63–4.14)   |
|                 | Nonwhite           | 0.77          | 0.65d         | 0.78          | 0.86          | 0.81          |
|                 | (ref: White)       | (0.59–1.02)   | (0.51–0.82)   | (0.39–1.58)   | (0.58–1.26)   | (0.58–1.13)   |
|                 | 50–59              | 1.19          | 1.18          | 0.67m         | 0.64          | 0.78          |
|                 | (ref: <50)         | (0.87–1.63)   | (0.99–1.40)   | (0.51–0.87)   | (0.33–1.25)   | (0.56–1.11)   |
|                 | 60–69              | 1.18          | 1.19          | 0.76          | 0.46f         | 0.75          |
|                 | (ref: <50)         | (0.93–1.51)   | (0.95–1.50)   | (0.49–1.19)   | (0.23–0.92)   | (0.51–1.12)   |
|                 | ≥70                | N/A           | 1.11          | N/A           | 0.40f         | 0.77          |
|                 | (ref: <50)         | (0.85–1.44)   |              |              | (0.20–0.81)   | (0.46–1.27)   |
|                 | Female             | N/A           | N/A           | N/A           | 1.53f         | 1.19          |
|                 | (ref: Male)        |              |              |              | (1.02–2.31)   | (0.98–1.43)   |
|                 | Medicare           | 0.79          | 0.98          | 0.68          | 1.33          | 0.83          |
|                 | (ref: Private insurance) | 0.61–1.03     | (0.68–1.40)   | (0.42–1.10)   | (0.8–2.02)    | (0.64–1.08)   |
|                 | Medicaid           | 0.68          | 0.76          | 0.50f         | 0.43f         | 1.42          |
|                 | (ref: Private insurance) | 0.44–1.04     | (0.53–1.10)   | (0.29–0.87)   | (0.22–0.86)   | (0.69–2.93)   |
|                 | Other insurance    | 0.70f         | 0.71m         | 0.97          | 1.08          | 0.94          |
|                 | (ref: Private insurance) | 0.57–0.86     | (0.54–0.94)   | (0.49–1.93)   | (0.65–1.80)   | (0.65–1.37)   |
|                 | Uninsured          | 0.56          | 1.56f         | N/A           | 0.98          | 0.72          |
|                 | (ref: Private insurance) | 0.29–1.09     | (1.08–2.25)   |              | (0.39–2.49)   | (0.39–1.33)   |
| Model 2:       | Nonwhite           | 0.96          | 1.01          | 1.06          | 0.54          | 0.73          |
| Patient race   |                    |              |              |              |              |              |
| interaction    |                    |              |              |              |              |              |
| effects        | Early RQRS         | (0.62–1.47)   | (0.66–1.53)   | (0.27–4.16)   | (0.28–1.03)   | (0.43–1.22)   |
|                 | Nonwhite           | 1.54          | 0.88          | 0.83          | 0.44          | 0.56          |
|                 | Later RQRS         | (0.82–2.89)   | (0.62–1.24)   | (0.31–2.20)   | (0.10–1.91)   | (0.27–1.16)   |
| Model 3:       | Female             | N/A           | N/A           | N/A           | 1.42          | 1.01          |
| Patient sex    |                    |              |              |              |              |              |
| interaction    |                    |              |              |              |              |              |
| effects        | Early RQRS         | (0.56–3.61)   | (0.65–1.57)   | (1.07         | 0.76f         | (0.59–0.99)   |
|                 | Female             | N/A           | N/A           | N/A           | (0.60–1.91)   | (0.65–1.57)   |
|                 | Later RQRS         | (0.82–2.89)   | (0.62–1.24)   | (0.31–2.20)   | (0.10–1.91)   | (0.27–1.16)   |

aThe BCS and MAC quality measures include patients under age 70; therefore, the ≥70 age category is not applicable for these quality measures.
bWe did not display results by sex for the breast cancer models because male patients are excluded from the BCS, HT, and MAC quality measures.
cWe did not display results by uninsured for the MAC quality measure because few patients were uninsured in the sample.
dp < .001.
ep < .01.
fp < .05.

Abbreviations: BCS, breast-conserving surgery; CI, confidence interval; HT, hormone therapy; MAC, multi-agent chemotherapy; N/A, not available; OR, odds ratio; ref, reference group; RQRS, Rapid Quality Reporting System.

Concordant adjuvant chemotherapy (ACT) for stage III colon cancer compared with patients who were younger than age 50 (Model 1 in Table 3; 60–69 compared to <50 age: OR = 0.46, 95% CI [0.23, 0.92]; ≥70 compared to <50 age: OR = 0.40, 95% CI [0.20, 0.81]). In addition, female patients were significantly more likely to receive guideline-concordant ACT compared with male patients (Model 1 in Table 3; OR = 1.53, 95% CI [1.02, 2.31]), and Medicaid-enrolled patients were
concordance with ACT by patient sex, insurance, or age group

esses, sharing of exemplary practices, and other initiatives insti-

tute to address patient barriers to concordant care.

and 91 percent for another NCCCP site). While we analyzed

and late RQRS time periods, there were no longer disparities in

process measures collected by the RQRS and constitute a fairly

have access to data on therapy omission and whether treat-

be completed. Furthermore, this analysis did not examine

nCCCP sites functioned as a network, engaged as a learning col-

and co-investment (e.g., support for RQRS, increased naviga-

at least one affiliated or employed

characteristic of the entire universe of factors

the likelihood of concordance with quality of care measures

by examining variation in baseline (pre-RQRS) quality of care

Patient-level data, the effect was site-specific. The NCCCP sites

have substantial heterogeneity, which increases the generaliz-

we noted that while the RQRS did improve quality of breast and
colon cancer care, and these improvements in the quality of care
were sustained through the later RQRS period, not all patients
benefited equally. However, not all of these differences indicate
traditional disparities in care such as privately insured patients
receiving better quality of care than patients insured by Medi-
care or Medicaid. Female Medicare beneficiaries with breast
cancer were significantly more likely to receive MAC than were
females with private insurance in the later RQRS period.

Concurrent NCCCP Quality of Care Subcommittee activities
included a working group to improve RQRS reporting and twice
annual presentations of the NCCCP results to the network,
which may have helped sites improve and sustain quality can-
cer care. Also, all sites had at least one affiliated or employed
oncology practice participating in the American Society of
Clinical Oncology Quality Oncology Practice Initiative (QOPI)
abstraction during the reporting period, which may have led to
an increased focus on quality improvement at the sites since
many RQRS measures are also QOPI Measures. Furthermore,
the NCCCP program design required management engagement
and co-investment (e.g., support for RQRS, increased naviga-

As noted by Halpern et al. [4], quality improvement pro-
cesses, sharing of exemplary practices, and other initiatives insti-
tuted as part of the NCCCP benefitted all population groups,
including those from minority or underserved populations.
For example, the NCCCP program focused on reducing health care
disparities through a number of initiatives, such as patient navi-
gation, which was used by some sites to address patient bar-
riers to concordant care.

This study has several important limitations. The analysis
aggregates results from all NCCCP sites that had substantial
variation in baseline (pre-RQRS) quality of care (for example,
the concordance rate for radiation after breast conserving sur-
gery during the pre-RQRS period was 30% for one NCCCP site

DISCUSSION
The goals of this study were to examine whether improve-
ments in guideline-concordant breast and colon cancer care during the
first 3 years following RQRS implementation noted by Halpern
et al. [3] had been sustained throughout the program, and to
examine whether significant quality improvements were also
noted for minority/underserved patients. Our results indicate
the improvements in quality of care were sustained through
2013 for all five measures examined. Significant differences in
the likelihood of concordance with quality of care measures
were identified among specific patient subgroups during the
early and later RQRS periods. For example, uninsured females
with hormone receptor positive breast cancer were significantly
less likely to receive hormonal therapy (quality measure HT)
than were women with private insurance. These results indicate
that while the RQRS did improve quality of breast and colon
cancer care, and these improvements in the quality of care
were sustained through the later RQRS period, not all patients
benefited equally. However, not all of these differences indicate
traditional disparities in care such as privately insured patients
receiving better quality of care than patients insured by Medi-
care or Medicaid. Female Medicare beneficiaries with breast
cancer were significantly more likely to receive MAC than were
females with private insurance in the later RQRS period.

CONCLUSION
The NCCCP pilot has resulted in increased numbers of patients
receiving guideline-concordant care for breast and colon cancer
in community settings, and the initial improvements that were
noted in the first few years of the RQRS have been sustained into
later years. The NCCCP pilot has been successful, in part, because
NCCCP sites functioned as a network, engaged as a learning col-

spective measures found site effects on concordance for all
five quality measures (data not shown). This limits our ability
to identify which specific NCCCP sites or aspects of the NCCCP
were most effective in improving quality of care overall and
for underserved populations. This analysis was also limited to
available data and did not cover the entire universe of factors
that could influence quality of care; for example, we did not
have access to data on therapy omission and whether treat-
ments were actually completed. Furthermore, this analysis did
not examine improvements in quality of care in non-NCCCP
hospitals, so it is unknown how much improvement can be
attributed to the NCCCP. More specifically, it is unknown how
much improvement in quality of cancer care can be attributed
to the NCCCP’s focus on improved quality and collaborative
sharing of best practices versus improved recording of treat-
ment administration due to the RQRS requirements. Finally,
outcomes for this analysis were limited to five quality-of-care
process measures collected by the RQRS and constitute a fairly
small component of the entire universe of structures, proc-
esses, and outcomes potentially influenced by the NCCCP.
Nevertheless, these analyses provide important information
on sustaining high quality of breast and colorectal cancer care
for patients treated at community hospitals.

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