

# Improving Quality of Cancer Care at Community Hospitals: Impact of the National Cancer Institute Community Cancer Centers Program Pilot

By Michael T. Halpern, MD, PhD, Pamela Spain, PhD, Debra J. Holden, PhD, Andrew Stewart, MA, Erica J. McNamara, MPH, Greer Gay, PhD, Irene Prabhu Das, PhD, and Steven Clauser, PhD

RTI International, Washington, DC, and Research Triangle Park, NC; American College of Surgeons, Chicago, IL; and National Cancer Institute, Bethesda, MD

## Abstract

**Purpose:** Patients with cancer treated at community hospitals may experience decreased quality of care compared with patients treated at higher-volume cancer hospitals. The National Cancer Institute Community Cancer Centers Program (NCCCP) pilot is designed to enhance research and improve cancer care at community hospitals. We assessed changes in quality of care among the 16 initial NCCCP sites versus 25 similar hospitals that did not participate in the NCCCP.

**Methods:** We compared changes in concordance with five National Quality Forum–approved quality of care measures (three for breast cancer, two for colon cancer) for patients diagnosed from 2006 to 2007 (pre-NCCCP initiation) versus 2008 to 2010 (post-NCCCP initiation) at NCCCP and comparison-group hospitals. Data were collected using the Commission on Cancer Rapid Quality Reporting System. Analyses were performed using multivariate logistic regression.

**Results:** Analyses included 18,608 patients with breast cancer and 7,031 patients with colon cancer. After NCCCP initiation, patient-level concordance rates for all five quality-of-care measures increased significantly among NCCCP and comparison-group hospitals. Increased quality of care among NCCCP sites was significantly greater than that among comparison-group hospitals for radiation therapy after breast-conserving surgery and hormonal therapy for women with hormone receptor–positive breast cancer. In multivariate regressions, increases in hormonal therapy among NCCCP-site patients were significantly greater than those among comparison-group hospitals.

**Conclusion:** Both NCCCP and comparison-group hospitals showed improved quality of care; however, NCCCP sites had significantly greater improvements for a subset of measures. This greater increase may reflect the multidisciplinary focus of the NCCCP. Because many individuals receive cancer treatment at community hospitals, facilitating high-quality care in these environments must be a priority.

## Introduction

Previous studies have indicated that patients with cancer treated at community hospitals may experience decreased quality of care compared with patients treated at higher-volume cancer hospitals. For example, Senthil et al<sup>1</sup> reported that patients undergoing resections for colon cancer at community hospitals versus National Comprehensive Cancer Network hospitals had fewer lymph nodes examined and were more likely to have fewer than the recommended minimum of 12 lymph nodes examined. Similarly, Halpern et al<sup>2</sup> reported that women with early-stage breast cancer undergoing surgery at community hospitals were significantly less likely to receive any lymph node biopsy than those treated at teaching hospitals.

Decreased quality of care may lead to worse outcomes for patients treated at community hospitals. Gutierrez et al<sup>3,4</sup> reported that patients with rectal or breast cancer treated at community hospitals had worse survival rates than those treated at teaching hospitals. In contrast, Sariego<sup>5</sup> reported no differences in survival rates for patients with breast cancer treated at high-volume hospitals and/or teaching centers compared with those treated at lower-volume community hospitals.

In 2007, the National Cancer Institute (NCI) launched the NCI Community Cancer Centers Program (NCCCP) pilot, an

initiative designed to help build a community-based research platform supporting basic, clinical, and population-based research on cancer prevention, screening, diagnosis, treatment, survivorship, and palliative care at community hospitals. Sixteen hospital sites were originally funded as part of the NCCCP in 2007 after a competitive selection process for participation in this pilot program.<sup>6</sup>

A comprehensive, multimethod evaluation of the NCCCP was recently completed.<sup>7</sup> One component of the evaluation focused on whether participation in the NCCCP changed the quality of cancer care over time (ie, before *v* after NCCCP initiation) and in comparison with a group of community hospitals that did not participate in the NCCCP.<sup>8</sup> The comparison hospitals were selected for similarity to the NCCCP sites in several aspects, including accreditation by the American College of Surgeons Commission on Cancer (CoC) and participation in the CoC Rapid Quality Reporting System (RQRS). This separate comparison group was included to facilitate assessments of changes associated with the NCCCP participation net of the effects of general trends on improved quality of care. This article presents results from the comparative evaluation, analyzing changes in quality-of-care measures at NCCCP sites versus comparison-group hospitals.

## Methods

### Study Sample

Information on the early development and organization of the NCCCP and an overview of project implementation and initiatives among the initial NCCCP sites has been previously presented.<sup>9,10</sup> For this evaluation, the study population consisted of patients who were diagnosed with and treated for breast or colon cancer in any of the 16 NCCCP sites or 25 non-NCCCP comparison hospitals between January 1, 2006, and May 31, 2010. Of the 16 NCCCP sites, eight participated as individual hospitals, whereas the remaining eight were members of one of two hospital systems. The two system sites—Catholic Health Initiatives and Ascension Health—each selected one or two lead sites to facilitate implementation of the NCCCP within their systems. Other NCCCP sites belonging to these systems were classified as developmental sites. A developmental site was defined as one not complying with all initial qualification criteria for an NCCCP site, but through its participation as part of a network of sites within its hospital system, it would likely accelerate performance in cancer care to reach near equivalence to a nondevelopmental site by the conclusion of the pilot. Appendix Table A1 (online only) presents the NCCCP sites, locations, and lead-versus-developmental status.

Twenty-five community hospitals similar to the NCCCP hospitals were selected as comparison sites. Hospitals were eligible as comparison sites if they were not 2007 NCCCP awardees, teaching research hospitals, or NCI-designated cancer centers; had oncology programs accredited by the CoC; and were beta-test sites for the CoC RQRS. These selection criteria were established to ensure that comparison hospitals were similar to NCCCP sites while also being RQRS beta-test sites. The requirement for RQRS beta-test participation ensured that similarly collected data on quality measures would be available from both hospital groups. Information on the comparison-group hospitals is also presented in Appendix Table A1 (online only).

### Data Sources

The main data source used for this study was the RQRS, which has been previously described.<sup>11</sup> The RQRS captured patient-level information on concordance for six quality-of-care measures: three for breast cancer, two for colon cancer, and one for rectal cancer. Because the number of patients eligible for the rectal cancer measure was small, and this measure had not been endorsed by the National Quality Forum (whereas the breast and colon cancer quality measures had been endorsed), this evaluation included results only from the breast and colon cancer measures.

The RQRS also identified each patient's treating hospital (to characterize NCCCP *v* comparison-group hospitals), date of diagnosis (to characterize treatment during pre- *v* post-NCCCP periods), and sociodemographic characteristics. No specific patient identifiers were included in the study data set.

The breast and colon cancer quality measures are listed in Table 1. All five quality measures were multidisciplinary; con-

**Table 1.** NQF-Endorsed Breast and Colon Cancer Quality Measures Obtained From RQRS Data

Quality Measure	Definition of Concordant Patient Cases
Breast cancer	
BCS + Rad	Radiation therapy is administered within 1 year (365 days) of diagnosis for women age < 70 years undergoing breast-conserving surgery for breast cancer
Breast-MAC	Combination (multiagent) chemotherapy is considered or administered within 4 months (120 days) of diagnosis for women age < 70 years with AJCC T1cN0M0 or stage II or III hormone receptor–negative breast cancer
Breast-HT	Tamoxifen or third-generation aromatase inhibitor is considered or administered within 1 year (365 days) of diagnosis for women with AJCC T1cN0M0 or stage II or III hormone receptor–positive breast cancer
Colon cancer	
Colon-ACT	Adjuvant chemotherapy is considered or administered within 4 months (120 days) of diagnosis for patients age < 80 years with AJCC stage III (lymph node–positive) colon cancer
Colon-12RLN	At least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer

Abbreviations: AJCC, American Joint Committee on Cancer; NQF, National Quality Forum; RQRS, Rapid Quality Reporting System.

cordance with these measures involved cooperation among physicians of multiple subspecialties and other health care providers. In addition, four of these quality measures (all except 12 regional lymph nodes excised during colon cancer surgery) were also multifaceted, incorporating initial surgery and subsequent adjuvant therapy; administration of adjuvant therapy within a limited time window; and (for all except radiation therapy after breast-conserving surgery) consideration of whether adjuvant therapy was contemplated but not administered because of patient refusal, comorbidities, or other relevant clinical factors.

This study used data reported to the RQRS from NCCCP and comparison-group hospitals for patients diagnosed with breast or colon cancer between January 1, 2006, and May 31, 2010. The last update for this study included diagnosed patient cases reported to the RQRS through May 31, 2011. To have at least 1 year after diagnosis for all study patients, as required for some of the measures, May 31, 2010, was used as the cutoff diagnosis date for included patients.

Collection of RQRS data was successfully initiated by all NCCCP and comparison-group hospitals in the second half of 2009. The RQRS was preloaded with breast and colon cancer patient cases reported to the National Cancer Data Base from that hospital for diagnosis years 2006 and 2007. Thus, concordance with the five quality measures for 2006 and 2007 was included. Hospitals subsequently reported data for patients diagnosed with breast or colon cancer in 2008, 2009, or 2010. For this study, patients diagnosed from 2006 to 2007 are considered to have been diagnosed pre-NCCCP initiation, whereas those diagnosed from 2008 to 2010 were classified as having been diagnosed post-NCCCP initiation.

## Study Outcome Measures

The outcomes assessed in this study were concordance with RQRS quality-of-care measures. In the RQRS, an eligible patient was classified as concordant with a measure if he or she received the indicated treatment within the specified time-frame. In addition, for three of the five quality measures, patients were also classified as being concordant if they were reported as having been considered for the indicated treatment, but clinical considerations or patient choice resulted in their not receiving this treatment. The two measures for which treatment had to occur for a patient to be considered concordant were radiation therapy after breast cancer surgery and  $\geq 12$  regional lymph nodes examined after colon cancer surgery. Only patients who were eligible for inclusion in each of the quality measures, based on age and clinical characteristics listed in Table 1, were included in calculation of concordance rates.

## Analyses

Institutional review board approval was obtained before initiation of study analyses. Bivariate descriptive analyses were performed at the patient level to assess differences in each of the five quality measure outcomes for the NCCCP sites by themselves and for the NCCCP versus comparison-group hospitals. Multivariate logistic regression analyses were also performed at the patient level for each quality-of-care outcome, controlling for clustering by hospital. In each model, the dependent variable was the dichotomous indicator (0 of 1) of whether a patient's care was concordant with a quality measure for which he or she was eligible. Regressions included an indicator variable for time period of diagnosis (ie, pre- *v* post-NCCCP initiation), an indicator variable for hospital group (NCCCP *v* comparison hospital), and the interaction of these two indicators. The indicator for time period corresponded to the difference in concordance with quality measures for NCCCP hospitals before versus after NCCCP initiation. The indicator for hospital group corresponded to the difference between the two hospital groups in the baseline period. The interaction term reflected the difference-in-difference parameter (ie, change in concordance with quality of care for NCCCP hospitals relative to change for comparison hospitals). Regression coefficients for the time period indicator were obtained from analyses with NCCCP sites as the reference group (to allow for this variable to correspond to NCCCP sites in the post-NCCCP period *v* in the baseline period). Regression coefficients for the cohort indicator and difference-in-difference term were obtained from separate regression analyses with comparison-group hospitals as the reference group to express the observed effects (if any) in terms of NCCCP sites relative to comparison-group hospitals.

Regressions also controlled for race (white, black, or other), age group (< 50, 50 to 59, or 60 to 69 years for breast-conserving surgery and multiagent chemotherapy measures, with additional age group of > 69 years included for three other measures), insurance status (private, Medicare, Medicaid, uninsured, or other), and sex (for two colon cancer measures).

## Results

### Descriptive Analyses

Table 2 lists the concordance rates for each quality measure for patients diagnosed at NCCCP hospitals and comparison-group hospitals for the pre- and post-NCCCP periods as well as the absolute change in concordance rates (pre- *v* post-NCCCP period). For all five quality measures, concordance increased significantly for patients from NCCCP hospitals and patients from comparison hospitals from the pre- to post-NCCCP periods.

For four of the five quality measures (all except 12 regional lymph nodes excised during colon cancer surgery), NCCCP sites had lower concordance rates than the comparison-group hospitals in the pre-NCCCP period, higher concordance rates in the post-NCCCP period, and therefore greater absolute changes in concordance rates from the pre- to post-NCCCP periods. For two of the quality measures, the absolute change in concordance among patients from NCCCP hospitals was significantly greater than the corresponding absolute change for comparison hospitals. Concordance with radiation therapy after breast-conserving surgery increased by 18.3% from the pre- to post-NCCCP periods among NCCCP hospitals, compared with an absolute change of 13.1% among comparison hospitals (difference significant at  $P < .01$ ). The absolute change in pre- versus post-NCCCP concordance with the quality measure of hormonal therapy for hormone receptor–positive breast cancer was 33.6% among NCCCP hospitals and 23.6% among comparison-group hospitals (difference significant at  $P < .05$ ). The differences (NCCCP *v* comparison hospital) in absolute change of quality measure concordance for the other three measures were not statistically significant.

### Regression Analyses

Table 3 lists results from the multivariate regression analysis for each of the five quality measures. Controlling for race, age group, insurance status, and sex, patients treated at NCCCP hospitals in the later (post-NCCCP) time period were significantly more likely to be concordant with each of the quality measures than patients treated at NCCCP hospitals in the pre-NCCCP period. Differences in quality measures concordance rates between NCCCP and comparison hospitals for the baseline (pre-NCCCP) period were not statistically significant for any of the five measures.

Although the odds ratios for quality measure concordance in the post-NCCCP period (ie, difference-in-difference term) generally indicated a trend toward greater likelihood of concordance among NCCCP hospitals, this difference was statistically significant for only one of the five quality measures. In the post-NCCCP period, the likelihood of concordance with hormonal therapy for women with hormone receptor–positive breast cancer was significantly greater among individuals treated at NCCCP hospitals than among those from comparison hospitals.

**Table 2.** Descriptive Statistics: Concordance Rates

Outcome Variable	NCCCP Hospital Patients										NCCCP Versus Comparison-Group Patients										
	2006 to 2007					2008 to 2010					NCCP Hospitals			Comparison Hospitals							
	Mean	95% CI		Mean	95% CI		P	Mean	95% CI		Mean	95% CI		P	Absolute Difference	95% CI		Absolute Difference	95% CI		P
Radiation therapy after breast-conserving surgery	72.2	70.4 to 74.1		90.6	89.4 to 91.8		< .05	74.1	72.4 to 75.9		87.3	86.1 to 88.4		< .05	18.3	16.1 to 20.6		13.1	11.0 to 15.2		< .01
Multiagent chemotherapy for breast cancer	72.1	68.0 to 76.3		88.0	85.3 to 90.7		< .05	76.8	73.3 to 80.2		87.9	85.8 to 90.1		< .05	15.9	11.1 to 20.6		11.2	7.2 to 15.2		NS
Hormonal therapy for breast cancer	49.0	46.9 to 51.0		82.5	81.2 to 83.9		< .01	56.1	54.3 to 58.0		79.8	78.6 to 81.0		< .05	33.6	31.1 to 36.0		23.6	21.4 to 25.8		< .05
Adjuvant chemotherapy for colon cancer	69.8	65.5 to 74.0		86.6	83.6 to 89.4		< .05	77.1	73.5 to 80.7		86.1	83.4 to 88.7		< .05	16.8	11.6 to 22.1		9.0	4.5 to 13.5		NS
12 regional lymph nodes excised during colon cancer surgery	75.5	73.4 to 77.6		87.3	85.7 to 88.9		< .05	73	70.8 to 75.2		86.3	84.8 to 87.8		< .05	11.7	9.2 to 14.4		13.3	10.6 to 16.0		NS

Abbreviations: NCCCP, National Cancer Institute Community Cancer Centers Program; NS, not significant.

**Table 3.** Regression Analysis Results\*

Variable	Radiation Therapy After Breast-Conserving Surgery			Multiagent Chemotherapy for Breast Cancer			Hormonal Therapy for Breast Cancer			Adjuvant Chemotherapy for Colon Cancer			12 Regional Lymph Nodes Excised During Colon Cancer Surgery		
	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
Intercept	2.54	1.73 to 3.74	< .001	3.14	1.99 to 4.96	< .001	0.95	0.63 to 1.42	NS	3.33	1.74 to 6.38	< .001	4.86	3.55 to 6.67	< .001
NCCCP in time 2 (v NCCCP in time 1)†	2.94	2.05 to 4.20	< .001	3.14	1.97 to 5.00	< .001	5.00	3.73 to 6.70	< .001	2.87	1.58 to 5.20	< .001	2.03	1.53 to 2.69	< .001
NCCCP in time 1 (v comparison group in time 1)‡	0.91	0.52 to 1.58	NS	0.60	0.34 to 1.07	NS	0.68	0.41 to 1.01	NS	0.60	0.27 to 1.35	NS	1.22	0.83 to 1.79	NS
NCCCP change in concordance between times 1 and 2 (v comparison group change)§	1.26	0.66 to 2.44	NS	1.53	0.80 to 2.92	NS	1.66	1.04 to 2.65	< .05	1.71	0.83 to 3.51	NS	0.95	0.66 to 1.36	NS

Abbreviations: NCCCP, National Cancer Institute Community Cancer Centers Program; NS, not significant; OR, odds ratio.

\* As discussed in Methods section, regressions also controlled for race, age group, insurance status, and sex (regressions of colon cancer quality measures only).

† Time variable (from regressions with NCCCP hospitals as reference group).

‡ NCCCP hospital group indicator variable.

§ Difference-in-difference term, examining difference in concordance rate over time between NCCCP and comparison hospitals.

## Discussion

This comparative evaluation demonstrated that the quality of care for patients with cancer diagnosed at the community hospitals in this sample improved over time. Significant increases occurred from the pre-NCCCP to the post-NCCCP periods (2006 to 2007 v 2008 to 2010) in the quality of care received by individuals with breast or colon cancer at both NCCCP and comparison hospitals. Regression analyses indicate that the improvement in quality of care at NCCCP sites was greater than that at comparison hospitals only for one quality measure: hormonal therapy for women with hormone receptor–positive breast cancer. Furthermore, the odds ratio for hormonal therapy among NCCCP patients ( $P = .0347$ ) may not have been statistically significant ( $P < .05$ ) if adjustments were made for multiple comparisons. However, regression analyses indicated that four of the five quality measures had odds ratios greater than 1.0 (indicating greater concordance with quality measures at NCCCP sites), although three of these were not statistically significant. In addition, the significant increase in the hormonal therapy measure among patients with breast cancer at NCCCP sites may indicate the multidisciplinary strength of this pro-

gram. Timely initiation of hormonal therapy after cancer surgery is especially challenging, often requiring hospital registrars to contact office-based oncology practices to query whether hormonal therapy has started and complete data collection on this measure.

The significant increases observed over time for the five study quality measures reflect a general trend toward increased quality of care in the United States. Over the study period (2006 to 2010), there was increased attention in the United States on guideline compliance and improvements in quality of care in general and with cancer treatment in particular. For example, the proportion of patients with colorectal cancer undergoing surgery at community hospitals who had at least 12 lymph nodes examined increased from 53.0% from 1996 to 2004 to 71.6% from 2005 to 2007.<sup>12</sup> More broadly (ie, not only at community hospitals), the Agency for Healthcare Research and Quality 2010 National Healthcare Quality Report showed improvements over time for a number of cancer-related quality measures, including the proportion of adults receiving colorectal cancer screening, the proportion of adults diagnosed with colorectal cancer at regional or distant stages, and the



proportion of patients with colorectal cancer undergoing surgical resection who had at least 12 lymph nodes examined.<sup>13</sup>

Beyond the secular trends observed in quality-of-care improvements during this time period, use of the CoC RQRS also likely increased concordance with the quality measures of this evaluation. The presence of such a system, which allows for collection of data on treatment patterns in near real time, almost certainly led to improved data collection. Some of the quality-of-care improvements observed among NCCCP and comparison-group hospitals therefore likely reflect better data capture and reduced measurement error rather than actual changes in treatment patterns. However, the RQRS also likely led to improved clinical interventions with its routine monthly surveillance of measure concordance at the patient level and benchmarking current performance based on past performance and relevant peer groups. Use of the RQRS at all NCCCP and comparison hospitals controlled for the potential effects of this data collection and reporting system on changes in concordance with quality measures, thus preventing a biasing effect if only one group of hospitals had used such a system. The difference in quality of care observed from the pre-NCCCP period to the post-NCCCP period for any one hospital, or any one hospital group, reflects secular trends, the RQRS, and—for NCCCP hospitals—the NCCCP. However, the difference in improvements in concordance between NCCCP hospitals and comparison hospitals likely reflects the impact of the NCCCP.

A number of factors may have contributed to the significantly greater increase in concordance observed among NCCCP hospitals. First, NCCCP hospitals were funded by the NCI to focus on a number of areas, including quality of care. This likely stimulated increased hospital activities and initiatives focused on improving quality of care. Second, NCCCP hospitals had the opportunity to regularly participate in a hospital network, sharing information on lessons learned and best practices with other NCCCP hospitals. It is likely that this also facilitated quality-of-care improvements, although direct assessments of this network were not part of the NCCCP evaluation. Third, akin to the so-called Hawthorne effect observed in patient-level studies, knowledge among personnel at NCCCP hospital cancer centers (in particular, directors of cancer centers) that changes in quality of care would be assessed as part of the NCCCP evaluation likely stimulated increases in this area.

There are a number of limitations associated with this study. The main limitation is that we cannot determine which components of NCCCP were responsible for the observed increased concordance in quality of care (relative to quality of care observed among comparison hospitals). For example, we cannot determine to what extent the observed quality improvements resulted from improved clinical practice, improved organization of care (eg, multidisciplinary care programs), NCCCP network sharing of best practices, or improved coding of existing practice. Furthermore, multiple quality-of-care initiatives may have occurred at NCCCP and comparison-group hospitals during the study time period; the observed increases in quality of

care may also have resulted, in part, from other factors. In addition, although the NCCCP was implemented in 2008, the beta test of the RQRS was not implemented until 2009 at both NCCCP sites and comparison-group hospitals. This potentially limited the opportunity for the RQRS to affect concordance with quality-of-care measures, particularly number of lymph nodes removed at the time of colon cancer resection, among both NCCCP sites and comparison-group hospitals.

Finally, outcomes for this comparative evaluation were limited to a relatively narrow set of five quality-of-care process measures collected by the RQRS and did not include patient perceptions of care or other measures that are also relevant. As such, these measures constitute a fairly small component of the entire universe of structures, processes, and outcomes potentially influenced by the NCCCP. The results presented as part of this comparative evaluation are only part of the overall evaluation of the NCCCP, which includes both qualitative and quantitative information such as patient perceptions.

Additional analyses are needed to assess which components of the NCCCP pilot are more effective in increasing quality of care among patients diagnosed at these hospitals and whether certain patient subgroups (eg, those from vulnerable or at-risk populations) are more likely to experience improvements in quality of care at NCCCP hospitals versus similar subgroups at comparison hospitals. Because a large proportion of individuals with cancer receive part or all of their treatment at community hospitals, programs and policies that facilitate high-quality care in these environments must be a priority.

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#### Author Contributions

**Conception and design:** Michael T. Halpern, Pamela Spain, Debra J. Holden, Andrew K. Stewart, Irene Prabhu Das, Steven B. Clauser

**Financial support:** Irene Prabhu Das, Steven B. Clauser

**Administrative support:** Greer Gay

**Provision of study materials or patients:** Andrew K. Stewart

**Collection and assembly of data:** Michael T. Halpern, Pamela Spain, Debra J. Holden, Andrew K. Stewart, Erica J. McNamara, Greer Gay

**Data analysis and interpretation:** Michael T. Halpern, Pamela Spain, Debra J. Holden, Andrew K. Stewart, Erica J. McNamara, Steven B. Clauser

**Manuscript writing:** All authors

**Final approval of manuscript:** All authors

Corresponding author: Michael T. Halpern, MD, PhD, RTI International, 701 13th St NW, #750, Washington, DC 20005; e-mail: mhalpern@rti.org.

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## Appendix

Table A1. NCCCP and Comparison-Group Hospitals

Name of Participating System, Hospital, or Cancer Center	Location	Type of Site
NCCCP		
Billings Clinic Cancer Center, Billings Clinic	Billings, MT	Lead
Helen F. Graham Cancer Center, Christiana Hospital	Newark, DE	Lead
Helen and Harry Gray Cancer Center, Hartford Hospital	Hartford, CT	Lead
Cancer Program of Our Lady of the Lake and Mary Bird Perkins, Our Lady of the Lake Regional Medical Center	Baton Rouge, LA	Lead
St Joseph Hospital Cancer Center and Cancer Institute, St Joseph Hospital	Orange, CA	Lead
Nancy N. and J.C. Lewis Cancer and Research Pavilion, St Joseph's/Candler Hospital	Savannah, GA	Lead
Sanford Cancer Center, Sanford Clinic	Sioux Falls, SD	Lead
Gibbs Regional Cancer Center, Spartanburg Regional Medical Center	Spartanburg, SC	Lead
Ascension Health		
St Vincent Oncology Center, St Vincent Indianapolis Hospital	Indianapolis, IN	Lead system site
University Medical Center/Brackenridge Hospital Shivers Center	Austin, TX	Developmental system site
Columbia St Mary's, Columbia St Mary's Cancer Center	Milwaukee, WI	Developmental system site
Catholic Health Initiatives		
St Joseph Cancer Institute, St Joseph Medical Center	Towson, MD	Lead system site
Penrose Cancer Center, Penrose-St Francis Health Services	Colorado Springs, CO	Lead system site
Good Samaritan Cancer Center, Good Samaritan Hospital	Kearney, NE	Developmental system site
St Elizabeth Cancer Center, St Elizabeth Regional Medical Center	Lincoln, NE	Developmental system site
St Francis Cancer Treatment Center, St Francis Medical Center	Grand Island, NE	Developmental system site
Comparison group		
Greenwich Hospital	Greenwich, CT	
JFK Medical Center	West Palm Beach, FL	
CentraState Healthcare System	Freehold, NJ	
Bayshore Community Hospital	Holmdel, NJ	
Southern Ocean County Hospital	Manahawkin, NJ	
Somerset Medical Center	Somerville, NJ	
Phoebe Putney Memorial Hospital	Albany, GA	
Piedmont Hospital	Atlanta, GA	
University Health Care System	Augusta, GA	
Gwinnett Hospital System	Lawrenceville, GA	
Southeast Georgia Health System-Brunswick	Brunswick, GA	
Hamilton Medical Center	Dalton, GA	
DeKalb Medical Center	Decatur, GA	
Northeast Georgia Medical Center	Gainesville, GA	
West GA-LaGrange	LaGrange, GA	
Floyd Medical Center	Rome, GA	
Emory Eastside Medical Center	Snellville, GA	
John D. Archbold Memorial Hospital	Thomasville, GA	
Tift Regional Medical Center	Tifton, GA	
South Georgia Medical Center	Valdosta, GA	
JFK Medical Center	Edison, NJ	
Saints Medical Center/Wheaton Franciscan Cancer Center	Racine, WI	
WellStar Health System	Marietta, GA	
Lehigh Valley Hospital	Allentown, PA	
Northside Hospital	Atlanta, GA	

Abbreviations: NCCCP, National Cancer Institute Community Cancer Centers Program.