EVALUATION OF THE ONCOLOGY CARE MODEL

Performance Period One – Appendix

Final

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A. Methods

A.1 Methods for Analysis of Medicare Claims and Administrative Data

This Appendix provides information about the methods used for the analyses of Medicare claims data for the Oncology Care Model (OCM) program evaluation. Our analyses compare utilization, cost, and end-of-life (EOL) outcome measures for practices participating in OCM to those of a comparison group of practices not participating in the Model. The primary data source used in the analyses of claims-based outcome measures was the Centers for Medicare and Medicaid Services (CMS) Chronic Conditions Warehouse (CCW), including Common Medicare Environment (CME) and Enrollment Database files, 100 percent Medicare Parts A and B claims files, and 100 percent Part D Prescription Drug Event (PDE) data files. This Appendix describes our observation period for the report on *Evaluation of the Oncology Care Model: Performance Period One* (Performance Period One or PP1 Report),[1] the claims and other data sources used in the analysis, the identification of chemotherapy episodes for analysis, the construction of the comparison group, key measures included, and the analytic approaches used.

A.1.1 Observation Period for Performance Period One Report

OCM began July 1, 2016 and focuses on six-month episodes of care triggered by chemotherapy for Fee-For-Service (FFS) Medicare beneficiaries with continuous Parts A and B enrollment. OCM is organized into six-month performance periods (PPs), for which CMS will retrospectively reconcile costs and the performance of participating practices. The five-year Model has a total of nine PPs scheduled. The first PP includes episodes that started between July 1, 2016 and January 1, 2017, and ended by June 30, 2017. The last PP will include episodes starting between July 2, 2020 and January 1, 2021, all of which will end by June 30, 2021.

Exhibit 1 summarizes the observation period for the PP1 Report. The baseline period for the evaluation includes six-month episodes that began January 2, 2014 through July 1, 2015 and ended between July 1, 2014 and December 31, 2015. The intervention period for the PP1 Report includes all six-month episodes that began during the Model's first PP (PP1), between July 1, 2016 and January 1, 2017, and ended between December 31, 2016 and June 30, 2017. It is possible that a beneficiary could have an episode during both the baseline and intervention periods, if the same beneficiary received chemotherapy and met the episode eligibility criteria in both periods. The only reason an episode would be shorter than six months is in the event of a beneficiary's death.

Practice applications to participate in OCM were due to CMS on June 30, 2015, and CMS notified practices of acceptance into the model in April 2016. CMS anticipated that accepted practices would make changes in staffing, resources, and care delivery in preparation for model start. As a result, we apply a "hold-out" period and do not allow episodes to begin between July 2, 2015 and June 30, 2016, so that early anticipatory practice changes did not contaminate the baseline period. It was especially important not to allow episodes to initiate in the last two quarters of the hold-out period since they would have ended during the intervention period.

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[1] Abt Associates. Evaluation of the Oncology Care Model: Performance Period One. Prepared for the Centers for Medicare and Medicaid Services in partnership with the Lewin Group, Harvard Medical School, GDIT, and Geisel School of Medicine at Dartmouth. Rockville, MD: Abt Associates; https://innovation.cms.gov/initiatives/Oncology-Care/

Exhibit 1: Observation Period

Performance Period	Episodes Triggering	Episodes Ending	Description
-4	1/2/2014–7/1/2014	7/1/2014–12/31/2014	Baseline period
-3	7/2/2014–1/1/2015	1/1/2015–6/30/2015	
-2	1/2/2015–7/1/2015	7/1/2015–12/31/2015	
-1	7/2/2015–1/1/2016	1/1/2016–6/30/2016	Hold-out period
0	1/2/2016–6/30/2016	7/1/2016–12/31/2016	
1	7/1/2016–1/1/2017	12/31/2016–6/30/2017	Intervention period for PP1 Report
2	1/2/2017–7/1/2017	7/1/2017–12/31/2017	Intervention periods for future evaluation reports
3	7/2/2017–1/1/2018	1/1/2018–6/30/2018	
4	1/2/2018–7/1/2018	7/1/2018–12/31/2018	
5	7/2/2018–1/1/2019	1/1/2019–6/30/2019	
6	1/2/2019–7/1/2019	7/1/2019–12/31/2019	
7	7/2/2019–1/1/2020	1/1/2020–6/30/2020	
8	1/2/2020–7/1/2020	7/1/2020–12/31/2020	
9	7/2/2020–1/1/2021	1/1/2021–6/30/2021	

A.1.2 Data Sources

The data sources necessary to construct the baseline and PP1 episode files and used in our analyses are summarized below in **Exhibit 2**. We obtained most of the data within the CMS Virtual Research Data Center (VRDC) environment.

Exhibit 2: Data Sources Used in the Claims Analysis

Data Source	Purpose
2014–2017 Part B Claims (VRDC)	• Identify Part B chemotherapy episode triggers for episode identification and cancer Evaluation and Management (E&M) services for episode attribution. • Determine the presence of cancer diagnosis within 59 days prior to and including the service date of a Part D chemotherapy claim to identify Part D chemotherapy episodes. • Identify cancer-related E&M services from Carrier claims during episodes. • Calculate episode-level utilization and cost measures for Part B services. • Construct Hierarchical Condition Category (HCC) scores.
2014–2017 PDE Tap Files (VRDC)	• Identify Part D chemotherapy triggers for episode identification. • Calculate episode-level Part D chemotherapy and overall drug utilization and cost measures.
2014–2017 Part A Claims (VRDC)	• Calculate episode-level utilization and cost measures for Part A services. • Construct HCC scores.

Data Source	Purpose
2014–2017 Integrated Data Repository (IDR) System	• Determine standardized Part A and B costs.
2014–2017 Common Medicare Environment (CME) Master Beneficiary Summary Files (VRDC)	• Determine Part A and B enrollment for beneficiary eligibility criteria for episode identification. • Determine: – Beneficiary characteristics including age, race, and gender – Beneficiary zip code of residence • Identify monthly Part D enrollment and dual eligibility
2014–2017 Enrollment Database Files (VRDC)	• Determine End-Stage Renal Disease (ESRD) coverage and Medicare Secondary Payer information for beneficiary eligibility criteria for episode identification.
2014–2016 Master Beneficiary Summary Files	• Determine: – County-level Medicare Advantage Penetration – County-level ED visits among fee-for-service (FFS) population
2014–2016 CMS Health Professional Shortage Area (HPSA) Files	• Identify county-level HPSA proportion.
2014–2016 National Plan and Provider Enumeration System (NPPES; VRDC)	• Supplement provider specialty information in the Part B Claims data.
2014–2016 Master Data Management (MDM) Beneficiary Extracts (VRDC)	• Identify beneficiary alignment to the following CMS initiatives: Pioneer Accountable Care Organization (ACO), Medicare Shared Savings Program (MSSP), Next Generation ACO, Comprehensive Primary Care (CPC), and CPC Plus.
July 2015, August 2016, and August 2017 SK&A Office-Based Physician File	• Identify practice's affiliation with health system and hospital ownership based on Tax Identification Number (TIN).
2014–2016 Area Health Resource Files (AHRF)	• Construct county-level sociodemographic and market supply characteristics.
Welch and Bindman 2016, Town and Gown Differences Among the Largest Medical Groups in the US[2]	• Identify TINs that are affiliated with a medical school's academic medical group.
NCCN and ASCO clinical guidelines	• Identify emetogenic chemotherapy treatment regimens, and guideline-recommended prophylactic antiemetic supportive therapies

The Medicare claims used in this report were retrieved in October 2017, with a uniform three months of run-out applied. A recent report on Medicare claims maturity[3] estimates that over 90 percent of Part A and B claims and Part D events (PDEs) are received within three months of service, and approximately 90 percent of Part B claims are finalized within three months [this timing does not apply to claims for the Monthly Enhanced Oncology Services (MEOS) payment].

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[2] Welch, P. and Bindman, A.B. (2016). Town and gown differences among the largest medical groups in the US. Journal of Academic Medicine, July, 91(7):1007–14.

[3] Chronic Condition Data Warehouse. (2017). CCW white paper: Medicare claims maturity. October. Version 2.0. Available from https://www.ccwdata.org/web/guest/ccw-medicare-data-white-papers.

A.1.3 Sample

OCM organizes payment reconciliation based on six-month episodes of care triggered by chemotherapy. Episodes are attributed to the practice TIN with the plurality of cancer-related E&M services during the episode.[4] The PP1 Report provides an overview of how the episodes are defined and attributed. We replicated the model episode identification and attribution methodology for the evaluation claims analyses to generate analytic files to select a suitable comparison group as well as to conduct descriptive and impact analyses.

OCM Practices

As of the end of PP1, there were 190 practices (both independent and hospital-based) participating in OCM. These practices vary considerably in size, ranging from a single oncologist practicing in one location, to several hundred practicing in multiple office sites. Some of the OCM practices specialize in oncology care, and others are multi-specialty practices providing other primary and specialty care in addition to cancer treatment. The majority of OCM practices treat a broad range of cancer diagnoses and offer infusion and hormonal chemotherapy; some also offer other therapies, such as radiation therapy or surgery. Section 3.1.2 of the PP1 Report contains more information about the characteristics of OCM practices.

Comparison Group Selection

OCM practices volunteered to participate in the Model and may differ from non-OCM practices in both observable and unobservable characteristics. As a requirement of the Model, OCM practices had to reassign all of their billing under a single TIN or pool together. Because the same requirement was not in place for non-OCM organizations, episodes for these organizations are attributed to individual TINs. The goal of the comparison group selection was to identify non-OCM TINs that were similar to the OCM practices prior to CMS's announcement of OCM.

Narrowed Pool of Potential Comparisons

We selected the comparison group for the evaluation using propensity score matching (PSM) and identified potential comparison organizations based on their TIN, as TINs are the basis for participation in OCM and episode attribution.

PSM

The objective of PSM is to identify a comparison group that is statistically similar to the treatment group based on observable factors. The propensity score is defined as the probability of receiving the treatment (in this case, participation in OCM), conditional on a set of observed characteristics. PSM aims to balance the distributions of important characteristics across the two groups (i.e., participating practices and the comparison group), improving the quality of inferences that can be made about the impact of the intervention. The key advantage of PSM over other methods is that by using a combination of covariates to compute a single score, it balances the treatment and comparison groups on a large number of covariates without eliminating TINs that may be good matches (i.e., similar), on average, to OCM practices.

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[4] RTI International. (2017). OCM performance-based payment methodology. Version 2.1. Prepared for the Centers for Medicare and Medicaid Services in partnership with Actuarial Research Corporation. Research Triangle Park, NC: RTI International; December 27. Available from https://innovation.cms.gov/initiatives/oncology-care/.

To estimate the propensity score for each TIN, a logistic regression model was fitted to account for episode-level, practice-level, and market-level factors that are conceptually and empirically related to the likelihood that a practice volunteered for OCM. We used the nearest neighbor match technique, a common matching method where each OCM practice was matched to non-OCM TINs that had the closest propensity score values within the specified "caliper." The caliper was set to one-third of the standard deviation of all propensity scores.   More information about the comparison group selection can be found in the *First Annual Report from the Evaluation of the Oncology Care Model: Baseline Period*[5] (Baseline Report) and in the section below.

Expansion of the Comparison Group following the Baseline Report

The comparison group used in the PP1 Report has 539 oncology TINs, an expansion from the 319 TINs that were used in the Baseline Report. The expansion improves our ability to make comparisons over the life of the model and generalize OCM. This section describes the expansion and documents the attributes of the current comparison group, which is used in all impact analyses moving forward. Adding more TINs, and therefore more episodes, to the comparison group increased statistical power of the econometric models used in the impact analyses, while mitigating the impact of practice attrition over the course of the study.

From a total of 1,958 non-OCM TINs identified for potential matching, we selected 539 TINs for the evaluation's comparison group. To ensure similarity between the selected comparison group and the OCM practices, we calculated standardized differences for each variable included in the PSM model, as well as the average standardized difference across all variables. This process generated strong evidence that the selected comparison group was statistically similar to the OCM practices overall, and on most key characteristics. Stuart (2010) recommends a standardized difference of 0.25 as an indication of potential balance issues,[6] but we evaluated the balance between OCM and comparison samples with a lower threshold of 0.20. The average standardized difference was 0.101, well below the threshold, which signals good balance overall. Of 31 variables, the standardized difference was greater than 0.20 for only 5 variables.

We conclude that the overall balance between OCM practices and the expanded comparison group is maintained. Analyses presented in the Baseline Report showing parallel trends between intervention and comparison groups are still valid and the key findings in the Baseline Report are unchanged when using the expanded comparison group. We will use the expanded comparison group for all the claims-based impact analyses in the evaluation. Because the comparison group sample for the baseline survey was selected based on the original comparison group of 319 TINs, we will continue to use that comparison group for survey-based analyses.

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[5] Abt Associates. First Annual Report from the Evaluation of the Oncology Care Model: Baseline Period. Prepared for the Centers for Medicare and Medicaid Services, in partnership with the Lewin Group, Harvard Medical School, GDIT, and Dartmouth College. Bethesda, MD: Abt Associates; February 1, 2018. Available from https://downloads.cms.gov/files/cmmi/ocm-baselinereport.pdf.

[6] Stuart, E.A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical Science* 25(1):1–21.

Expansion Approach

Full details of the original comparison group selection methodology are included in the Baseline Report. To select the new TINs to expand the comparison group, we re-estimated the same propensity score matching (PSM) model used to select the original comparison group. We made minor modifications to improve precision, but we did not change the criteria used to select the initial set of comparison practices. For example, we used updated data7 for all practices/TINs and matched OCM practices to five nearest neighbors (rather than the three nearest neighbor criteria that were used in the original PSM). The new TINs selected by the second propensity score model were appended to the existing comparison group, thereby creating an expanded comparison group of 540 unique TINs.[8]

Comparability of the Groups and Balance with OCM practices

Exhibit 3 displays results from the T-tests conducted to assess comparability of the original and expanded comparison groups. P-values with a single asterisk indicate statistically significant differences in means.

The expanded comparison group is statistically similar to the original comparison group across most key attributes. The newly selected TINs used to expand the comparison group had a smaller episode count, on average, than the original comparison group. This is to be expected because the first propensity score model selected all the largest TINs into the comparison group and there were very few new large TINs for the expansion of the comparison group. Episode count is imbalanced with the OCM practices in both the original comparison group and the expanded comparison group. This imbalance is accounted for in later stages of analyses. In addition, the original and expanded comparison groups also have statistically significant differences in the proportion of TINs that are a high cost practice in the market. In the original comparison group, 30 percent of the TINs were considered high cost, compared to 24 percent in the expanded comparison group. This difference actually improves balance with the OCM practices; adding the new TINs to the comparison group shifted the proportion closer to the OCM proportion (20 percent).

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[7] The updated data measures practice structure variables such as episode count, NPI count, and provider specialty mix at the performance period-level; the data that was previously used to select the comparison group relied on calendar year measurements of these variables.

[8] Note that the final comparison group used in the PP1 Report consisted of 539 TINs. One of the selected comparison practices was removed after these analyses were run since it was entering the OCM model as a new entrant due to forced pooling.

Exhibit 3: Means of Variables included in the PSM Model and T-Test Results between the Original and Expanded Comparison Groups

Variable	Mean Values			T-Tests Between the Original and Expanded Comparison Groups (319 versus 540)	
	OCM Group (n=190)	Original Comparison Group (n=319)	Expanded Comparison Group (n=540)	T Value	P Value
Episode Count	533	266	224	2.068	0.039*
% NPIs with Oncology Specialty	0.61	0.60	0.60	0.378	0.705
Affiliation with Academic Medical Center	0.16	0.11	0.09	0.834	0.404
Participation in Other CMMI Initiatives	0.13	0.10	0.09	0.221	0.825
Median Household Income ($)	55,627.63	54,131.93	55,466.90	-1.347	0.179
Medicare Advantage Penetration	30.89	30.45	30.06	0.416	0.677
High Cost Practice in Market	0.20	0.30	0.24	2.084	0.038**
Multiple Markets	0.18	0.16	0.15	0.337	0.736
Mean 2014 HCC Score	1.87	1.86	1.87	-0.112	0.911
% Medicaid Dual Eligible	0.14	0.15	0.16	-0.872	0.383
% Black	0.10	0.10	0.10	0.057	0.955
% Hispanic	0.06	0.05	0.05	0.365	0.715
Total NPI Count	40.96	26.75	23.46	1.239	0.216
% Female	0.61	0.60	0.60	-0.089	0.929
% Lung Cancer Bundle	0.10	0.10	0.10	0.577	0.564
% Colorectal Cancer Bundle	0.07	0.07	0.07	0.678	0.498
% Lymphoma Cancer Bundle	0.07	0.06	0.06	-0.388	0.698
% Leukemia Cancer Bundle	0.04	0.04	0.04	-1.092	0.275
% Melanoma Bundle	0.01	0.00	0.00	-1.214	0.225
% Bladder Cancer Bundle	0.02	0.02	0.02	0.113	0.910
% Radiation Oncologists	0.11	0.12	0.11	0.038	0.970
% Endocrine only Therapy for Prostate Cancer	0.10	0.11	0.11	0.002	0.998
% Endocrine only Therapy for Breast Cancer	0.26	0.26	0.26	-1.045	0.297
% of Cancer Patients treated by TIN with at least one chemo episode	0.85	0.85	0.85	-0.495	0.621
Multiple Sites	0.56	0.41	0.38	0.699	0.485
% of Benes in Other CMMI Initiatives	0.15	0.14	0.14	-0.293	0.770
Mortality Rate	0.11	0.11	0.11	0.156	0.876
Primary Care Provider per 10,000	8.80	8.74	8.76	-0.080	0.936
% Market Share	0.39	0.35	0.35	-0.136	0.892
Home Flow	0.72	0.74	0.76	-1.146	0.252
Population	1,300,162	1,123,191	1,068,888	0.384	0.701

Source: Results of PSM model, 2014-2015.

We also assessed the impact that adding the TINs has on balance between the OCM practices and the expanded comparison group (as measured by standardized differences). **Exhibit 4** displays balance for the expanded comparison group. The expanded comparison group is balanced (standardized difference ≤ 0.2) with the OCM practices on most attributes. Pre-intervention trends were similar with the updated comparison group as for the original comparison group.

In summary, adding additional TINs to the comparison group improves balance with the OCM group on several variables, and any loss of generalizability is mainly related to differences in the size distribution between OCM and comparison practices (which already existed in the baseline comparison group because many of the largest oncology practices in the U.S. are participating in OCM).

Exhibit 4: Balance between the OCM Practices and Expanded Comparison Group as Measured by Standardized Differences

Characteristics	OCM Practices						Expanded Comparison Group						Standardized Differences
	N	Mean	Minimum	Median	Maximum	Variance	N	Mean	Minimum	Median	Maximum	Variance	
Episode Count	190	533.20	1.00	311.00	10810.50	1.14E+06	540	224.37	11.50	143.75	1906.50	62970.20	0.399*
% NPIs with Oncology Specialty	190	0.61	0.00	0.64	1.00	0.08	540	0.60	0.02	0.55	1.00	0.10	0.060
Affiliation with Academic Medical Center	190	0.16	0.00	0.00	1.00	0.13	540	0.09	0.00	0.00	1.00	0.08	0.211*
Participation in Other CMMI Initiatives	190	0.13	0.00	0.00	1.00	0.11	540	0.09	0.00	0.00	1.00	0.08	0.108
Median Household Income	190	55627.63	32666.00	53546.22	105217.25	1.76E+08	540	55466.90	31487.00	52225.00	110891.61	2.17E+08	0.011
Medicare Advantage Penetration	190	30.89	4.34	29.64	62.03	154.16	540	30.06	1.65	29.69	63.44	181.81	0.065**
High Cost Practice in Market	190	0.20	0.00	0.00	1.00	0.16	540	0.24	0.00	0.00	1.00	0.18	-0.085
Multiple Markets	190	0.18	0.00	0.00	1.00	0.15	540	0.15	0.00	0.00	1.00	0.13	0.097
Mean 2014 HCC Score	190	1.87	1.01	1.86	2.70	0.06	540	1.87	1.03	1.85	3.21	0.08	0.015
% Medicaid Dual Eligible	190	0.14	0.00	0.12	0.69	0.01	540	0.16	0.00	0.13	0.85	0.01	-0.123
% Black	190	0.10	0.00	0.07	0.48	0.01	540	0.10	0.00	0.04	0.97	0.02	-0.042
% Hispanic	190	0.06	0.00	0.02	0.83	0.01	540	0.05	0.00	0.02	0.96	0.01	0.054
Total NPI Count	190	40.96	1.00	20.00	443.00	3635.46	540	23.46	1.00	10.00	248.00	1239.23	0.354*
% Female	190	0.61	0.00	0.62	1.00	0.01	540	0.60	0.00	0.61	1.00	0.02	0.046
% Lung Cancer Bundle	190	0.10	0.00	0.10	0.24	0.00	540	0.10	0.00	0.09	0.35	0.00	0.039
% Colorectal Cancer Bundle	190	0.07	0.00	0.07	0.24	0.00	540	0.07	0.00	0.06	0.28	0.00	-0.005
% Lymphoma Cancer Bundle	190	0.07	0.00	0.07	0.19	0.00	540	0.06	0.00	0.06	0.57	0.00	0.072
% Leukemia Cancer Bundle	190	0.04	0.00	0.04	0.11	0.00	540	0.04	0.00	0.04	0.19	0.00	0.019
% Melanoma Bundle	190	0.01	0.00	0.00	0.05	0.00	540	0.00	0.00	0.00	0.07	0.00	0.163**
% Bladder Cancer Bundle	190	0.02	0.00	0.02	0.21	0.00	540	0.02	0.00	0.01	0.23	0.00	-0.033
% Radiation Oncologists	190	0.11	0.00	0.00	1.00	0.03	540	0.11	0.00	0.00	1.00	0.04	-0.006

Characteristics	OCM Practices						Expanded Comparison Group						Standardized Differences
	N	Mean	Minimum	Median	Maximum	Variance	N	Mean	Minimum	Median	Maximum	Variance	
% Endocrine only Therapy for Prostate Cancer	190	0.10	0.00	0.07	0.75	0.01	540	0.11	0.00	0.08	0.91	0.02	-0.111
% Endocrine only Therapy for Breast Cancer	190	0.26	0.00	0.26	0.82	0.01	540	0.26	0.00	0.26	0.74	0.01	-0.025
% of Cancer Patients treated by TIN with at least one chemo episode	190	0.85	0.15	0.89	0.98	0.02	540	0.85	0.03	0.88	1.00	0.01	0.019
Multiple Sites	190	0.56	0.00	1.00	1.00	0.25	540	0.38	0.00	0.00	1.00	0.24	0.355*
% of Benes in Other CMMI Initiatives	190	0.15	0.00	0.14	0.46	0.01	540	0.14	0.00	0.13	0.66	0.01	0.057
Mortality Rate	190	0.11	0.00	0.11	0.22	0.00	540	0.11	0.00	0.11	0.27	0.00	0.071
Primary Care Provider per 10,000	190	8.80	2.73	8.44	17.50	6.66	540	8.76	2.61	8.36	44.71	10.13	0.014
% Market Share	190	0.39	0.00	0.22	1.00	0.14	540	0.35	0.00	0.19	1.00	0.13	0.105
Home Flow	190	0.72	0.10	0.77	1.00	0.05	540	0.76	0.10	0.83	1.00	0.05	-0.184
Population	190	1.30E+06	21947.00	549414.00	1.01E+07	4.22E+12	540	1.07E+06	10202.00	382667.50	1.01E+07	3.74E+12	0.116
Overall													0.099

Source: Results of balance tests, 2014-2015

* Indicates significant imbalance with the OCM group (standardized difference > 0.2).

**Indicates characteristics that were imbalanced between the OCM group and the original comparison group, but are now more balanced.

A.1.4 Utilization and Cost Outcome Measures

In this section, we outline the key claims-based utilization, cost, and EOL measures for the PP1 Report.

Exhibits 5, 6 and 7 define each of the utilization, cost, and EOL outcome measures evaluated in our impact analyses.

Exhibit 5: Definition of Utilization Outcome Measures

Outcome Measure	Definition
Inpatient Utilization	
Inpatient (IP) Stays	Occurrence and number of Part A IP stays per episode (claim type 60, 61). The measure includes IP stays that originated during the episode (i.e., claim from date on the IP stay occurred within the episode start and end dates). Multiple claims that comprised the same IP stay were collapsed into a single stay.
IP Days	Number of IP days per episode among IP stays that originated during the episode. The entire length of an IP stay was allocated to the episode, even if the stay extended beyond the end of the episode.
Intensive Care Unit (ICU) Admissions	Number of IP stays occurring within the ICU per episode. Claims for ICU were identified using revenue center codes of 0200–0209.
30-Day Readmissions	Occurrence and number of 30-day IP readmissions per episode. Only readmissions associated with an index IP stay (a stay during which the beneficiary survives the hospitalization) that originated during the episode were included. A 30-day readmission that occurred after the end of the episode, but was tied to an index stay that occurred during the episode, was counted in the measure.
30-Day Unplanned Readmissions	Occurrence and number of 30-day unplanned readmissions per episode. A readmission was considered planned if it was associated with a diagnosis or procedure code that was considered planned per CMS' ACO readmission measure specifications[9]; all other readmissions were deemed unplanned. Only unplanned readmissions associated with an index stay that originated during the episode were included. A 30-day unplanned readmission that occurred after the end of the episode, but was tied to an index stay that occurred during the episode, was counted in the measure.
Emergency Department (ED) Utilization	
All ED Visits	Number of all ED visits per episode. This measure includes both ED visits that resulted and did not result in an IP stay. ED visits were identified using revenue center codes 0450–0459.
ED Visits Not Resulting in IP Stay	Occurrence of ED visit not resulting in an IP stay at the same facility per episode. This measure includes ED visits and observation stays that originated in the ED (based on the same revenue center codes above). Observation stays that did not originate in the ED (identified in the hospital outpatient file using revenue center codes 0760 or 0762, or HCPCS codes G0378 or G0379) were not reflected in this measure.
ED Visits Resulting in IP Stay	Number of ED visits resulting in an IP stay at the same facility per episode.
Post-Acute and Outpatient Service Utilization	
Skilled Nursing Facility (SNF) Stays	Occurrence and number of all Part A SNF stays during an episode (claim type 20, 23).
SNF Days	Number of Medicare-covered SNF days per episode. All covered SNF days of the stay were allocated to the episode even if the stay extended past the end of the episode.

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[9] Centers for Medicare and Medicaid Services. (2016). ACO #8: Risk standardized all condition readmissions: measure information form (MIF). Version 2.1. Effective 1/1/2016. Available from https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/aco-8.pdf.

Outcome Measure	Definition
Home Health Services	**Occurrence** of Part A home health service per episode (claim type 10).
60-Day Home Health Spells	**Number** of 60-day home health spells per episode.
Part B Outpatient Service Utilization	
Cancer-Related E&M Services	**Number** of Part B cancer-related E&M services per episode. A cancer-related E&M service was defined as an E&M service in a non-institutional setting with a cancer diagnosis on the same line (per OCM Model specifications for episode identification and attribution).
Imaging Services	**Occurrence** of any Part B imaging service (standard, advanced, other) per episode. **Number** of Part B standard and other imaging services per episode. Standard and other imaging included x-ray, echography, and cardiac catheterization. **Number** of Part B advanced imaging services per episode. Advanced imaging included computerized axial tomography (CAT) scans, magnetic resonance imaging (MRI), and nuclear medicine.
Radiation Therapy Service	**Occurrence** and **number** of Part B radiation therapy services per episode. Procedure codes for radiation therapy were identified per OCM Model specifications.
Outpatient Therapy Services	**Occurrence** and **number** of Part B outpatient rehabilitation therapy services per episode. Outpatient rehabilitation therapy services were identified according to procedure codes found in CMS' annual therapy update.[10]
Chemotherapy and Drug Utilization	
Part D Chemotherapy Use	**Occurrence** of a Part D PDE filled for a chemotherapy drug per episode. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive. NDCs for Part D chemotherapy drugs were identified according to the episode chemotherapy trigger list, per OCM Model specifications.
Part D Fills	**Number** of all Part D PDEs filled per episode. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.
Part D 30-Day Equivalents	**Number** of all Part D 30-day equivalents per episode. A 30-day equivalent was calculated as the day supply reported on the PDE divided by 30. A PDE with a day supply of zero was counted as zero equivalent. However, it was still counted toward the total Part D fills. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.
Part B Chemotherapy Services	**Number** of Part B chemotherapy services per episode. Part B chemotherapy drugs were identified using the HCPCS codes found within the chemotherapy trigger list, per OCM Model specifications.
Part B Drug Services	**Number** of all Part B drug services, including chemotherapy, per episode.

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[10] Centers for Medicare and Medicaid Services. (2017). Annual therapy update [Internet homepage]. Last modified 11/29/2017. Available from https://www.cms.gov/Medicare/Billing/TherapyServices/AnnualTherapyUpdate.html.

Exhibit 6: Definition of Cost Outcome Measures

Outcome Measure	Definition
Overall Costs	
Total Cost of Care (TCOC) – Part A, B, and D Costs	Total Part A, B, and D costs of care, not including MEOS payments, per episode. Part A and B costs are standardized. In other words, geographic differences in Medicare payment rates (e.g., due to variations in local wages or input prices) as well as payment variation resulting from CMS program reductions/additions (e.g., for programs including bundled payment) were removed. Part D costs are not standardized and were measured as the sum of low-income cost-sharing amount (LICS) and 80 percent gross drug cost above the out-of-pocket threshold (GDCA). All costs reflect Medicare payment, not allowed costs.
Part A and B Costs	Total standardized Part A and B costs, excluding MEOS payments, per episode.
Part D Costs	Total Part D costs per episode. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.
Part D GDC	Total Part D gross drug costs (GDC) per episode. A prescription's GDC reflect payments made by all parties (beneficiary, plan, Medicare) and was calculated as the sum of ingredient cost, dispensing fee, sales tax, and vaccine administration fee. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.
Part A Cost Components	
IP Costs	Costs of Part A IP stay(s) per episode. The full cost of the IP stay was allocated to the episode, even if the stay extended beyond the end of the episode.
30-Day Readmission Costs	Costs of 30-day readmissions (both planned and unplanned) per episode.
30-Day Unplanned Readmission Costs	Costs of 30-day unplanned readmissions per episode.
SNF Costs	Costs of Part A SNF stays per episode. The full cost of the SNF stay was allocated to the episode, even if the stay extended beyond the end of the episode.
Home Health Costs	Costs of Part A home health services per episode.
IP Rehabilitation Costs	Costs of Part A services at an IP rehabilitation facility per episode (claim types 60, 61).
Long-Term Care Costs	Costs of Part A services at a long-term care hospital per episode (claim types 60, 61).
Hospice Costs	Costs of Part A hospice services per episode (claim type 50).
Part B Cost Components	
Imaging Costs	Costs of Part B standard, advanced, and other imaging services per episode.
Laboratory Costs	Costs of Part B laboratory services per episode.
Drug Costs	Costs of Part B drug services, including chemotherapy, per episode.
E&M Costs	Costs of Part B E&M services per episode.
All Other Institutional Costs	Costs of all other Part B institutional services (including the Part B institutional outlier payment) per episode.
All Other Non-Institutional Costs	Costs of all other Part B non-institutional services (including all other physician and non-drug DME) per episode.
Chemotherapy and Other Cancer-Related Costs	
Part B and D Chemotherapy Costs	Part B and D chemotherapy costs per episode.
Part B Chemotherapy Costs	Part B chemotherapy costs per episode.

Outcome Measure	Definition
Part D Chemotherapy Costs	Part D chemotherapy costs per episode. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.
Part D Chemotherapy GDC	Part D chemotherapy GDC per episode. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.
Hormonal or Low-Risk Chemotherapy Costs	Part B and Part D costs for hormonal or low-risk chemotherapies identified for breast, prostate, and bladder cancers, per episode.
Chemotherapy Administration Costs	Costs of Part B chemotherapy administration per episode.
Radiation Therapy Costs	Costs of Part B radiation therapy services per episode.
Cancer-Related E&M Costs	Costs of Part B cancer-related E&M services per episode.
Beneficiary Cost Sharing	
Part A Beneficiary Costs	Standardized Part A beneficiary costs (deductible plus coinsurance) per episode.
Part B Beneficiary Costs	Standardized Part B beneficiary costs (deductible plus coinsurance) per episode.
Part D Beneficiary Costs	Part D beneficiary costs per episode. Part D beneficiary cost-sharing was computed as the sum of the patient pay amount and the other True Out of Pocket (TrOOP) amount, and does not include low-income cost-sharing amounts. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.
Part B Chemotherapy Beneficiary Costs	Standardized Part B beneficiary costs for chemotherapy drugs per episode.
Part D Chemotherapy Beneficiary Costs	Part D beneficiary costs for chemotherapy drugs per episode. This measure was restricted to episodes for beneficiaries enrolled in Part D for all months of the episode, while alive.

Exhibit 7: Definition of EOL Outcome Measures

Outcome Measure	Definition	Notes
Aggressive Care		
Any Chemotherapy during the Last 14 Days of Life	Occurrence of any chemotherapy dates of service within 14 days of the beneficiary's date of death.	NQF #2010. The objective of EOL care is to ensure the patients' comfort and dignity while dying. A means to this goal is the cessation of futile, treatments that detract from life quality. The choice to continue such treatment should solely rest with patients and their families, but any divergence in chemotherapy at the EOL between OCM and comparison practices would suggest changing treatment patterns.
Any IP Admission in the Last 30 Days of Life	Occurrence of any IP admissions within 30 days of the beneficiary's date of death.	A concern is that terminally ill individuals might receive, invasive procedures that reduce the quality of their short remaining time, which they might prefer to spend in as much comfort as possible at home with family and friends. Therefore, we view a reduction in IP hospitalizations immediately prior to death as improved EOL care.
Any ICU Use in the Last 30 Days of Life	Occurrence of any ICU admissions within 30 days of the beneficiary's date of death.	NQF #0213. We examine hospital stays with ICU use as a subset of all hospital stays.
Emergency Department (ED) Use (2+ Visits) in the Last 30 Days of Life	Occurrence of two or more (2+) ED visits within 30 days of the beneficiary's date of death.	NQF #0211 (although not currently endorsed). We examine usage of the ED (including observational stays) in the last 30 days of life.
Hospice Utilization and Timing		
Never Admitted to Hospice	Occurrence of a beneficiary dying with no previously recorded hospice use (specifically, no hospice claims ending within the six months prior to the date of death).	NQF #2015. We view a decrease in the rate of cancer patients never using hospice as an improvement in EOL care, and a desirable objective of OCM, that suggests improved communication and advance care planning.
Being on Hospice 1–2 Days before Death	Occurrence of a beneficiary discharged to death from hospice (discharge codes 40, 41, or 42) and previously using hospice continuously 1-2 days before death.	NQF #0216. For some patients who reach hospice only in the last two days of life, there may be insufficient time to bring symptoms (e.g., pain, anxiety) under control. A decrease in this measure would be viewed as an improved process quality outcome.

Outcome Measure	Definition	Notes
Hospice 3–180 Days before Death	Occurrence of a beneficiary discharged to death from hospice (discharge codes 40, 41, or 42) and previously using hospice continuously 3-180 days before death.	Hospice is intended for pain and symptom management in the last six months of life, but requires at least a few days to bring symptoms under control to have any beneficial effect on patients' comfort. This measure was created as a contrast to the other two hospice measures: here, using hospice, and using hospice for a more clinically ideal duration.[11]
Place of Death		
Deaths that Occur in Hospitals	Occurrence of being discharged deceased (discharge status 20) during an IP stay.	The hospice philosophy places a strong emphasis on supporting patients at home for as long as possible, recognizing that most dying people prefer to be in a comfortable, familiar setting rather than in a hospital, at the EOL. We view a decrease in the rate of cancer patients dying in hospitals as an improvement in EOL care quality.

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[11] We acknowledge that even three or four days of hospice use prior to death may not be sufficient, and some clinical experts believe at least a week (or more) is necessary before the hospice duration could be considered "clinically ideal." We include days 3–7 here as a contrast to the short-stay duration measure definition, and may consider altering this specification in future reporting.

A.1.5 Sample Characteristics

Exhibits 8, 9 and 10 contain definitions of the beneficiary-, episode-, and practice-level characteristics, respectively, which we present in the PP1 Report.

Exhibit 8: Definition of Beneficiary-Level Characteristics

Characteristic	Definition
HCC Risk Score	Used to quantify beneficiary comorbidity and predict plan payments in Medicare Advantage risk adjustment, HCC scores are based on beneficiary demographics and diagnostic history. The member's HCC score assigned for a given year is calculated using diagnoses information from the previous year. For example, a patient's 2015 HCC score was constructed using diagnoses on 2014 claims.
Age Group	Beneficiaries were divided into the following groupings: 0–64, 65–69, 70–74, 75–79, 80–84, and 85+.
Dual Eligibility Status	Beneficiaries were flagged as dual eligible if they were either Medicaid full-dual or partial-dual eligible.
Race/Ethnicity	Beneficiaries were categorized as Non-Hispanic White; Black (or African-American); Hispanic; or Other (Asian/Pacific Islander, American Indian, Other, Unknown). Race/ethnicity was determined using the RTI International's race code methodology.

Exhibit 9: Definition of Episode-Level Characteristics

Characteristic	Definition
Cancer Bundle	The 25 cancer bundles of interest were derived from the cancer types assigned to each episode per the OCM methodology. Each episode was assigned a cancer type using the plurality of cancer diagnoses on E&M services in the carrier file that occurred during the episode. The 21 reconciliation-eligible cancer types in the model methodology[12] were expanded to 24, with breast cancer divided into hormonal only and non-hormonal only, prostate cancer divided into low vs. high risk,[13] and bladder cancer divided into low vs. high risk.[14] The 25th bundle is the non-reconciliation eligible cancer types combined together.

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[12] The 21 cancer types are acute leukemia, anal cancer, bladder cancer, breast cancer, central nervous system (CNS) tumor, chronic leukemia, endocrine tumor, female genitourinary cancer other than ovary, gastro/esophageal cancer, head and neck cancer, small intestine/colorectal cancer, kidney cancer, liver cancer, lung cancer, lymphoma, myelodysplastic syndrome (MDS), malignant melanoma, multiple myeloma, ovarian cancer, pancreatic cancer, and prostate cancer.

[13] Low- and high-risk designations for prostate cancer follow the methodology used by CMS in the OCM performance-based payment (PBP) prediction model. Low-risk (or castration sensitive) prostate cancer is defined as episodes in which the primary cancer type is prostate cancer and there is receipt of either androgen deprivation and/or an anti-androgen therapy without any other chemotherapy during the episode. High-risk prostate cancer is designated for episodes that are assigned prostate cancer and do not meet the above criteria.

[14] Low- and high-risk designations for bladder cancer follow the methodology used by CMS in the OCM PBP prediction model. Specifically, low-risk bladder cancer is defined as episodes in which the primary cancer type is bladder cancer and there is receipt of Bacillus Calmette-Guérin (BCG) therapy and/or mitomycin without any other chemotherapy during the episode. High-risk bladder cancer episodes are episodes that are assigned bladder cancer and do not meet the above criteria.

Characteristic	Definition
Episodes Triggered by Part D Chemotherapy	Episodes were coded as having been triggered by Part D chemotherapy if the initial episode claim for chemotherapy was a Part D claim.
Use of Part D Chemotherapy	Whether or not an episode involved use of a Part D chemotherapy drug was determined for all Part D episodes (or episodes during which a beneficiary was enrolled in Part D for all months of the episode, while alive),
Novel Therapy	Episodes in the intervention period were classified as involving a novel therapy if the chemotherapy drug used was considered to be a novel therapy at the time for the approved cancer bundle. A list of novel therapies and their effective dates were provided by CMS. We required the episode start date to be on or before the end of the two-year window during which a drug was considered a novel therapy.
Immunotherapy	Episodes were classified as using an immunotherapy if the one of the following drugs was taken during the episode: Atezolizumab, Avelumab, Durvalumab, Ipilmumab, Nivolumab, or Pembrolizumab.

Exhibit 10: Definition of Practice-Level Characteristics

Characteristic	Definition
Practice Size	The practice size was measured in two ways: average number of episodes per practice and average number of NPIs per practice. NPIs were identified if they billed a Part B cancer-related E&M service and/or non-institutional Part B chemotherapy through the TIN and also served at least one episode attributed to the TIN.
Provider Specialty Mix	A practice's NPIs were classified into the following provider specialties: • Oncology specialty (hematology/medical oncology, surgical oncology, radiation oncology, gynecologic oncology) • Urology specialty • Nurse Practitioner (NP)/Physician Assistant (PA) specialty We assigned the provider specialty by first using the specialty reported in the Part B claims data; if that was not reported, we added the specialty that mapped to the NPI's primary taxonomy in the NPPES data. We computed practice-level proportions of oncology, urology, and NP/PA specialties among all NPIs, along with the proportion of oncology sub-specialties among oncologist NPIs.
Oncology-Specialty Practices	Practices were classified as an oncology-only specialty and/or NP/PA specialty. The oncology specialty included any of the following specialties: hematology/oncology, medical oncology, surgical oncology, radiation oncology, or gynecologic oncology.
Single-Site Practices	For each practice, the number of provider zip codes through which relevant NPIs billed at least one cancer E&M service were counted. A practice was categorized as a single site if it only billed through one provider's zip code.
Affiliation with Health System or Hospital Ownership	Practices were identified as affiliated with a health system or as hospital-owned based on information constructed from the July 2015 and August 2016–2017 SK&A Office-Based Physician File for the baseline and intervention periods, respectively. The SK&A data are collected on a rolling basis via a telephone survey of physician practice sites.

A.1.6 Analytic Approach for Claims-Based Analyses

In this section, we describe the descriptive and impact analyses conducted for the PP1 Report.

Descriptive Analyses

Using SAS Enterprise Guide v7.1 in the VRDC environment, we conducted bivariate analyses to compare OCM practices and comparison practices along a number of episode- and practice-level characteristics. We report z-tests and t-tests of statistical significance for differences in proportions and mean values, respectively. The statistical significance was determined at the 10 percent level.

Impact Analyses

Given the non-randomized design of OCM, we used difference-in-differences (DID) regression analyses to estimate the impact of OCM on key outcomes. The DID model is a statistical technique that quantifies the impact of an intervention by comparing changes in outcomes of treatment cases (in this case, OCM practices) to changes in outcomes in the comparison group (comparison practices) observed before and after model implementation. The DID models describe the average effect of OCM over the entire duration of the intervention period, PP1.

We performed all DID analyses at the episode level using Stata/MP 14.2 statistical software in the VRDC environment. For cost outcomes, we used ordinary least squares (OLS) regression models; for outcomes with a large proportion of zeros, we applied two-part models (Logit and OLS). For binary utilization outcomes measures, we used Logit models; and for utilization count measures, we used negative binomial models. In all models, standard errors were adjusted to reflect the fact that episodes were clustered at the practice level (i.e., multiple episodes can be attributed to the same practice, and there are likely provider patterns or actions that can affect all episodes attributed to a practice so that errors may be correlated). Most models also included state fixed effects to adjust for state-level characteristics (e.g., regulations, policies) not captured by the covariates included in the models (see below).[15] In addition to the DID estimate, we present regression-adjusted means for OCM and comparison episodes during the baseline and intervention periods to examine trends in measures between the two periods, as well as the DID estimate expressed as a percentage of the OCM baseline mean to quantify the relative percent change over time for OCM episodes.

Model Specification

The general form of our DID specification was:

$$y_{it} = \beta_0 + \beta_1 OCM_i + \beta_2 Post_t + \boldsymbol{\alpha_0}(OCM_i * Post_t) + \beta_3 X_{it} + \varepsilon_{it} \qquad (1)$$

where $\boldsymbol{y_{it}}$ is an outcome for episode *i* originating in quarter *t*; ***OCM*** is a dummy separating OCM practices from control TINs; ***Post*** is a dummy separating intervention data from the baseline data; and $\mathbf{X}_{it}$ is a set of pre-determined covariates for episode *i* occurring at quarter *t*.

The coefficient $\boldsymbol{\alpha_0}$ in model (1) captures the incremental, or marginal, impact of the OCM intervention on outcome $\boldsymbol{y_{it}}$, relative to changes over the same time period in episodes of comparison practices. This interpretation is valid only in linear models. In non-linear models, observational data are modeled as a function, which is a nonlinear combination of the model parameters. For non-linear models, we transformed $\boldsymbol{\alpha_0}$ into the marginal effect (ME). The ME is equal to the average ME for each observation, which is calculated as the difference between the predicted treatment outcome and a predicted

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[15] Because there were few episodes from practices/TINs in Delaware, these episodes were grouped with Pennsylvania. The cancer subgroup models excluded state fixed effects due a low number or the absence of episodes for certain state/cancer bundle combinations.

counterfactual outcome where the impact of OCM ($\boldsymbol{\alpha_0}$) is assumed to be zero.[16] Estimating ME in this way allows for uniformity in interpretation across linear and non-linear models.

Covariate Selection

The DID approach controls for time-varying changes that are common to both the comparison and OCM groups, as long as model assumptions are met, as well as unmeasured time-invariant differences not captured by the model. **Exhibit 11** identifies the beneficiary-, practice-, and market-level factors we controlled for within our analysis. The covariates included in DID models were informed by the broader research literature on oncology outcomes, a review of National Quality Forum measures,[17] discussions with clinical experts, and thorough extensive statistical testing of alternative specifications using baseline period episodes. We identified 28 covariates for inclusion in all impact models. For a small group of select outcomes, we excluded a subset of redundant covariates to achieve model convergence.

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[16] Puhani, P. A. (2012). The treatment effect, the cross difference, and the interaction term in nonlinear "difference-in-differences" models. *Economics Letters* 115(1):85–87.

[17] National Quality Form. (2018). National Quality Forum [Internet homepage]. [Updated March 23, 2003; cited November 9, 2003]. Available from http://www.qualityforum.org/Home.aspx.

Exhibit 11: Covariates Included in DID Models

Domain	Model Covariate	Definition
Beneficiary-Level		
Beneficiary Characteristics	Sex	Beneficiaries were categorized as male or female.
	Race/ethnicity	Beneficiaries were categorized as non-Hispanic White, Black, Hispanic, or Other.
	Age	Beneficiaries were categorized as under 65, 65–69, 70–74, 75–79, 80–84, and 85+ years of age.
	Medicaid dual eligibility	Beneficiaries were categorized as having full/partial Medicaid benefits or having no benefits.
	Part D enrollee	Beneficiaries were coded as a Part D enrollee if enrolled in Part D for all months of the episode, while alive.
Center for Medicare and Medicaid Innovation (CMMI) Program Overlap	Beneficiary alignment to other CMMI program	Beneficiaries were coded as aligned if they were involved in at least one of the following CMS initiatives: Pioneer ACO, MSSP, Next Generation ACO, CPC, or CPC Plus.
Beneficiary Clinical Characteristics	Cancer bundle	Depending on the model, this covariate was based on all 25 cancer bundles or a subset of cancer bundles that are relevant to the outcome/subgroup.
	Previous episode	If beneficiaries had an episode within two years of the current episode, with at least six months between episode trigger dates, they were flagged as having a previous episode.
	Chemotherapy source	Episodes were categorized based on the type(s) of chemotherapy the beneficiary used during the episode: Part B chemotherapy only, Part D chemotherapy only, or Part B and D chemotherapy.
	CMS HCC risk score	A beneficiary's HCC risk score for the episode was categorized based on quartiles. Quartile cut-points were derived from the episode-level distribution during the baseline period.
Practice-Level		
Practice Organization and Affiliations	Affiliation with an academic medical center	A practice was coded as affiliated if it was affiliated with at least one academic medical center.
	Affiliation with a health system	A practice was coded as affiliated if it was affiliated with at least one health system.
	Hospital ownership	A practice was coded as owned if it was owned by at least one hospital.
Practice Size and Volume	Episode count	A practice's total number of episodes was categorized based on quartiles. Quartile cut-points were derived from the practice-level distribution during the baseline period.
	Practice size	Practices were coded as having 1–3 or 4+ oncology NPIs to distinguish between small and other practices.

Domain	Model Covariate	Definition
Practice Specialty Type	Oncology-only specialty	Practices were coded as oncology-only if all NPIs within the practice had either an oncology specialty or an NP/PA specialty.
	Presence of radiation oncology NPIs	Whether or not a practice had at least one radiation oncology NPI, it was flagged.
	Presence of surgical oncology NPIs	Whether or not a practice had a least one surgical oncology NPI, it was flagged.
	Presence of gynecologic oncology NPIs	Whether or not a practice had a least one gynecologic oncology NPI, it was flagged.
	Percent NP/PA NPIs	A practice's share of NPIs who is/are an NP/PA was categorized based on quartiles. Quartile cut-points were derived from the practice-level distribution during the baseline period.
Market-Level		
Market Size	County population	The population size of the practice's county was categorized based on quartiles. For practices with multiple counties, this market characteristic and all other listed below were weighted according to the number of cancer E&M services the practice billed through each county. Quartile cut-points were derived from the market-level distribution during the baseline period.
Market Demographics, Income, and Poverty	Percent of population 65+	The percent of population over age 65 in the practice's county was categorized based on quartiles. Quartile cut-points were derived from the market-level distribution during the baseline period.
	Percent in poverty	The percent of population living in poverty in the practice's county was categorized based on quartiles. Quartile cut-points were derived from the market-level distribution during the baseline period.
Market Exposure to Alternative Models	Medicare Advantage penetration	The percent of Medicare Advantage penetration in the practice's county was categorized based on quartiles. Quartile cut-points were derived from the market-level distribution during the baseline period.
Market Provider Supply	Percent of population designated as a Primary Care HPSA	The practice's percent of county population residing in a HPSA was categorized as 0 percent, >0–20 percent, or >20 percent. Cut-points were derived from the 2015 distribution of the HPSA proportion among markets with at least one OCM practice or comparison practice.
	Ratio of specialists to primary care providers	A ratio was calculated from the number of specialists divided by the number of primary care physicians in the practice's county. Each practice's ratio was categorized based on quartiles. Quartile cut-points were derived from the market-level distribution during the baseline period.
Market Utilization	Total IP ED visits among FFS population	The practice's county-level IP ED visits per 10,000 FFS population was categorized based on quartiles. Quartile cut-points were derived from the market-level distribution during the baseline period (composite score averaging 2014 and 2015 values).

Subgroup Analyses

We conducted analyses for cancer subgroups in which there was evidence of heterogeneity and for which we had adequate statistical power in PP1 to detect statistically meaningful differences. The first set of subgroup analyses focused on the 10 most-prevalent cancer bundles, based on the proportion of episodes attributed to OCM practices in the baseline and intervention periods.[18] In addition, a separate set of subgroups were defined according to episodes for low-risk and high-risk cancer bundles. Low-risk cancer bundles included breast cancer episodes having only hormonal therapies (no other chemotherapy), and prostate and bladder cancer episodes having only low-risk chemotherapy regimens. Episodes in the remaining 22 cancer bundles were combined into the high-risk cancer bundle subgroup.

Parallel Trends Assumption

The DID model assumes that trends for outcome measures in the baseline period are similar for OCM and comparison episodes, and would remain so in the absence of the intervention. This allows DID analyses to account for unobserved variables affecting both groups, which are assumed to remain fixed over time. Because DID analyses do not account for unobservable variables that are not fixed over time, failure of the parallel trends assumption results in biased DID estimates.

We evaluated whether the parallel trends assumption held during the baseline period for each outcome measure reported in the PP1 Report.[19] In order to evaluate trends over more time periods, we measured periods on a quarterly basis instead of PP basis; to do so, we split up each baseline PP and intervention PP1 into two quarters - episodes that initiated in the first half (e.g., PP1_1) and episodes that initiated in the second half (e.g., PP1_2). For each measure, we estimated a regression model using the same functional form and covariates as the main impact analyses, including an indicator for OCM, a linear trend, and an OCM and trend interaction term. We considered baseline trends as parallel for the two groups if there was no statistical difference (at the 0.05 level) between the linear trends of OCM and comparison episodes.[20] All but three outcome measures met the parallel trend assumption.

Sensitivity Tests

We conducted comprehensive tests to assess the sensitivity of OCM impacts estimated from our primary DID model, to the model specification and sample used in the estimation process. The main goals of the sensitivity tests were to understand (1) factors driving the OCM impact estimates, and (2) the stability of estimates from the main DID model (e.g., in terms of magnitude, sign, precision). These sensitivity tests also served as an additional layer of quality assurance (e.g., identifying unexpected results, divergence of signs) and help to ensure the reliability of DID results.

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[18] These subgroups include hormonal-only breast cancer, non-hormonal-only breast cancer, low-risk prostate cancer, high-risk-prostate cancer, lung cancer, lymphoma, colorectal/small intestine cancer, multiple myeloma, chronic leukemia, and non-reconciliation eligible cancers.

[19] Using the full sample of episodes, trends for more than 60 outcome measures were evaluated for the PP1 Report. Trends for an additional 100+ subgroup models were also evaluated.

[20] For the small subset of outcomes and models that did not pass the parallel trend test, we conducted a second set of linear trend tests that excluded the first baseline quarter, given the influence of the episode algorithm within this quarter. Trends for one outcome measure in our primary analysis, including the full sample, and trends for seven subgroup outcome measures met the parallel trend assumption when the first baseline PP was excluded.

To understand how robust the impact estimates were to the model specification, measurement period, and episode sample used, we performed several sensitivity tests on six important outcome measures: number of IP stays, number of ED visits not resulting in an IP stay, TCOC, Part A and B costs, Part B and D chemotherapy costs, and Part D costs.

The tests examined sensitivity of the results to the following:

- Choice of model functional form
- Selection of covariates included in the model
- Inclusion of episodes initiating in the hold-out period within the baseline sample (see **Exhibit 1**)
- Exclusion of episodes with outlier costs (top five and ten percent of TCOC)
- Exclusion of episodes for the largest OCM practices (for which comparison matching was most difficult)
- Exclusion of episodes for beneficiaries without Part D enrollment in all months
- Exclusion of episodes initiating in the first baseline quarter (to examine the effect of the episode algorithm)

In the main analyses included in this report, the DID impact estimate for each of the six outcomes was not statistically significant. The sensitivity tests substantiated the robustness of these results, yielding very few deviations from the main findings. In nearly all cases, the direction of the impact estimated from the sensitivity test was the same as that of the main model. In almost all cases, the confidence interval of the DID impact resulting from the sensitivity test had a very large overlap with the confidence interval resulting from the main model and so we felt that there was not sufficient evidence to alter the main findings.

Estimation of Probability of Impact

In addition to the DID impact analyses above, we estimated the probability of OCM impacts for a selected number of outcome measures. Probability estimates are useful for addressing essential policy questions about the likelihood that a program had the intended or desired impacts (or conversely, unintended or undesired impacts). P-values associated with impact estimates do not provide this information,[21] and for many stakeholders, probability statements are easier to interpret.

We calculated probabilities for four key outcomes, specifically TCOC per episode, the number of IP stays per episode, the number of ED visits not resulting in an IP stay per episode, and the number of ED visits resulting in an IP stay per episode. These measures were selected for probability analysis because of their relevance to the cost and quality goals of OCM. In addition, the utilization measures may be important early indicators of the potential impacts of enhanced services under OCM. We evaluated two approaches for computing impact probabilities: (1) probabilities derived from a Bayesian analysis, and (2) an approximation of these probabilities based on our main “frequentist” impact analyses described above.

The frequentist approach had several statistical and computational advantages, so the probabilities reported in this PP1 Report were based on that approach. We estimated a distribution for each impact derived from the DID analyses. Specifically, we estimated a normal distribution, with the mean and standard deviation equal to the DID estimate and the corresponding standard error (with an adjustment to

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[21] In contrast, the p-value indicates how well the data support the null hypothesis that there is no difference between groups (in this case, between OCM and comparison groups for a specific outcome measure).

account for clustering), respectively. The probability that the impact was a particular value (e.g., fell above or below zero) was estimated by applying this distribution.

A.1.7 Measures and Analytic Approach for Clinical Analyses

Guideline-Recommended Prophylactic Antiemetic Supportive Therapy

We used National Comprehensive Cancer Network (NCCN) and American Society of Clinical Oncology (ASCO) supportive care guidelines to characterize guideline-recommended prophylactic antiemetic use among patients receiving intravenous chemotherapy. We assigned an emetogenicity risk (risk of vomiting) to each individual chemotherapy agent as outlined in the guidelines. We identified treatment episodes for OCM and comparison patients, and the dates of chemotherapy infusion in each episode. We then assigned each episode to the emetogenicity risk class for the highest emetogenic risk chemotherapy agent given during the episode. We excluded episodes with only low-risk agents as well as moderate-risk agents where there was also a high-risk oral agent because we could not be certain what date the oral agent was started. We then selected the first infusion date within a given risk class for each patient. This was done so that patients were not represented more than once in each risk-class analysis, and also to reduce the likelihood of under-ascertainment of oral antiemetic use (as patients receiving subsequent episodes of chemotherapy may already have Part D antiemetic medications at home and may not need medication refills).

Within the episodes described above, we measured the use of oral and intravenous antiemetics, stratified by emetogenicity risk category. Specifically, we looked for antiemetic dispensing in Part D and in claims for office-administered Part B medications. The following antiemitics were included: NK1 receptor antagonists (aprepitant, fosaprepitant, rolapitant, and the combination medication netupitant-palonosetron), 5-HT3 receptor antagonists (ondansetron, dolasetron, granisetron, and palonosetron), olanzapine, dronabinol, and nabilone. We did not measure the use of prochlorperazine, dexamethasone, and other frequently used antiemetics because we assumed the wide use of these adjunctive and low-cost agents. The window for identification of primary prophylactic antiemetic use was within 14 days before through one day after the first chemotherapy date during the episode for that emetogenic drug.

We defined guideline-recommended antiemetic use, per the NCCN and ASCO antiemesis guidelines (current as of 2018), as depicted in **Exhibit 12**. Antiemetic regimens other than those included in the table were considered not guideline-recommended, including antiemitics that were either less intensive or more intensive than recommended by guidelines. Within the guideline-recommended prophylactic antiemetics for moderate- and low-risk categories, we also designated certain guideline-recommended regimens as “high-intensity” antiemetic regimens. The purpose of this designation was to evaluate changes in the intensity of antiemetic use from among the range of potential agents recommended in the guidelines, which differ in efficacy and cost.

Exhibit 12: Guideline-Recommended Antiemetic Regimens for Intravenous Chemotherapy, by Emetogenicity Risk Category

Emetogenicity Risk Category	Drug 1	Drug 2 (Required in Addition to Drug 1)
High	Netupitant-palonosetron	(none)
High	NK1 receptor antagonist (any)	5-HT3 receptor antagonist (any)
High	Palonosetron	Olanzapine
Moderate*	5-HT3 receptor antagonist (any)	Olanzapine
Moderate*	Netupitant-palonosetron	(none)
Moderate*	NK1 receptor antagonist (any)	5-HT3 receptor antagonist (any)
Moderate	5-HT3 receptor antagonist (any)	(none)
Low*	Ondansetron, dolasetron, or granisetron	(none)
Low	(none)	(none)

* Antiemetic regimens marked with an asterisk were considered "high-intensity" guideline-recommended antiemetics for the purposes of this analysis; (none) includes no antiemetic drugs or less-potent antiemetic drugs that we did not study. These other less-potent antiemetic drugs may still be appropriate to address symptoms a patient may have.

We used a DID framework to access OCM impact on antiemetic prescribing. The baseline period for these analyses included five (of six) baseline quarters, and the intervention period was comprised of PP1. For one of the analytic models (guideline-recommended antiemetic use for high emetogenic risk chemotherapy), the baseline period showed non-parallel trends. However, our inspection of data from the hold-out quarters (four quarters between the baseline and intervention periods) supported a parallel trends assumption (see Appendix F), and we therefore did not adjust this analysis for differences in baseline trends. All impact estimates were adjusted for the same covariates as in other claims-based analyses.

Chemotherapy-Associated Hospital Utilization

As described in the Methods section of the PP1 Report, we adapted the CMS measure of chemotherapy-associated hospitalizations and ED visits, which was originally developed and tested among patients receiving chemotherapy in hospital outpatient departments. Our revised measure examines chemotherapy-associated utilization that occurs during six-month episodes in OCM practices and comparison practices, regardless of the location where the patients received chemotherapy.

Specifically, we first identified all chemotherapy with dates between the episode trigger start and end dates. We included outpatient claims, carrier claims, and Part D claims that had a cancer diagnosis on the chemotherapy claim (as per the CMS specifications for episode identification). We assessed ED visits and hospitalizations that occurred within 30 days after Part B chemotherapy infusions or 30 days after taking a Part D drug (through the last available dose based on fill date plus the number of days dispensed).

As specified by the CMS measure, we identified hospitalizations and ED visits that occurred within 30 days after a claim for chemotherapy with diagnosis codes for one of the following diagnoses: anemia, dehydration, diarrhea, emesis, fever, nausea, neutropenia, pain, pneumonia, or sepsis.

For each measure, we then used logistic regression models to assess the DID impact of OCM. In addition to the covariates in our standard models, we also adjusted for the number of days receiving infused chemotherapy (Part B claims) or days of oral medication (Part D claims) during the six-month episode, to adjust for differences in exposure to chemotherapy and time at risk for associated ED visit or hospitalization.

In the PP1 Report, we present results for hospitalizations (with and without an ED visit) and for all ED visits (with and without leading to a hospitalization). Because patients who go to the ED and are admitted will be counted in both measures, we also show results in Appendix F for ED visits that led and did not lead to a hospitalization. The baseline trends differed in OCM vs. comparison practices for the measure of chemotherapy-associated ED visit leading to admission (P=0.03), and thus we show results with and without adjustment for this baseline trend.

A.1.8 Measures for Analyses of the Practice Transformation Plan Responses

Exhibit 13 below shows how the analytic measures for analysis of the Practice Transformation Plans were defined.

Exhibit 13: Description of Analytic Measures Created from Practice Transformation Plan Responses

Measure Name	Responses Coded as One (Other Responses Coded as Zero)	Availability
Used OCM Revenue to Hire Additional Staff	Yes	2016 and 2017
Care Coordination		
Performing Medication Reconciliation with Outside Clinicians	Using this tactic/approach	2016 and 2017
Performing Medication Reconciliation with Patients during Care Transitions		2016 and 2017
Conducting Individualized Education with Patients for All Medications		2017 only
Preparing Patients for Referral or Other Specialty Consultation		2016 and 2017
Tracking Patients Referred to Other Specialists through Entire Process		2016 and 2017
Participating in Health Information Exchange with Other Practices		2016 and 2017
Use of Risk Stratification		
Assigning a Risk Status to Each Patient	Using this tactic/approach	2016 and 2017
Assigning Patients to a Risk Cohort		2017 only
Stratifying Patients into Actionable Risk Cohorts		2016 and 2017
Patient Provider Communication		
Providing Patient Portal with Access to Medical Information and Documents	Using this tactic/approach	2016 and 2017
Providing Secure Email of Medical Information and Documents		
Use Remote Monitoring Technology Data to Promote Change in Patient Health		
Employing Telephone Visits		
Offering Two-Way Video Visits		
Using Patient Decision Aids, Such as Option Grids or Video Decision Aids		
Discussing Treatment Options, including Palliative Care, Early		

Measure Name	Responses Coded as One (Other Responses Coded as Zero)	Availability
Enhanced Oncology Services		
Providing Clinicians Outside the Practice Access to Patients' Medical Records	Using this tactic/approach	2016 and 2017
Offering Extended Evening Hours		
Offering Weekend Hours		
Offering Same-Day Appointments		
Using Call Center Triage		
Core Functions of Patient Navigation		
Coordinating Appointments with Clinicians Inside and Outside Practice	Meet need for 81–100% of OCM beneficiaries	2016 and 2017
Maintaining Communication with Patients and Their Families		
Ensuring that Appropriate Medical Records are Available at Appointments		
Arranging Language Translation or Interpretation Services		
Facilitating Connections to Follow Up on Services		
Providing Access to Clinical Trials		
Building Partnerships with Local Agencies and Groups		
Facilitating Financial Support		
Arranging Transportation		2017 only
Arranging Child or Elder Care		
Helping with Paperwork		
Using Data for Continuous Quality Improvement (CQI)		
Review of Data with Practice on a Quarterly Basis: Quality of Care	Data reviewed on at least a quarterly basis	2016 and 2017
Review of Data with Practice on a Quarterly Basis: Utilization		
Review of Data with Practice on a Quarterly Basis: Patient Experience		
Employing a Formal Model of Quality Improvement in Your Practice	Using this tactic/approach	
Sharing Team/Provider-Identified Data within the Practice		
Strategies to Support Adherence to National Guidelines/Standardize Treatment Approaches		
Holding Multidisciplinary Treatment Planning Conferences or Workshops	Using this tactic/approach	2016 and 2017
Integrating Clinical Decision Support (CDS) in Documentation Workflow		2017 only
CDS is Integrated with the Electronic Health Record	Check box marked as yes	2016 and 2017
CDS is Integrated with the Chemotherapy Electronic Order Management System		

A.2 Patient Survey Methods

A.2.1 Survey Analytic Methods

For this PP1 Report, we conducted two survey analyses. The first analysis compares care experiences reported by OCM respondents with those reported by a matched group of comparison respondents, at the baseline survey.[22] That baseline survey wave used both the main and alternative surveys, and also the decedent survey, for OCM and comparison respondents (**Exhibit 14**). Specifically, we estimated the risk-adjusted mean difference in survey responses between OCM and comparison respondents using the following regression model:

$$y_{ig} = \beta_0 + \beta_1 OCM_i + \beta_2 X_{it} + \ \varepsilon_{ig},$$

where y_{ig} is a survey outcome for patient i in group g, OCM_i is an indicator signifying OCM respondents, and X_{it} represents a set of predetermined patient- and practice-level covariates for patient i in group g.

The second analysis examined trends in care experiences reported by OCM respondents from baseline through intervention survey wave 3 (we have not yet collected data from a comparison group in the intervention period, and have not yet repeated the decedent survey in the intervention period). The trend analysis used the following regression model:

$$y_{it} = \beta_0 + \beta_1 IW1_i + \beta_2 IW2_i + \beta_3 IW3_i + \beta_4 X_{it} + \ \varepsilon_{it},$$

where y_{it} is a survey outcome for patient i in wave t, ***IW1-IW3*** are indicators signifying respondents in intervention wave 1-3 (baseline wave is the reference wave), and X_{it} represents a set of patient- and practice-level covariates for patient *i* in wave *t*. This model estimated risk-adjusted outcomes for each survey wave (i.e., how OCM practices perform over time if they treat the same patient population in each wave). To test whether there was a statistically significant change over all survey waves, we estimated a separate regression model with a linear time trend for each outcome. In the model with a linear time trend, wave indicators were replaced with a single, continuous wave variable. The coefficient of the linear time trend variable is our estimate of the average change in outcome for each wave.

For both analyses, we combined responses to the main survey and the alternative survey to understand care received by patients who survived and those that did not, except for EOL care questions, which are not asked in the main survey. For questions about EOL care, we combined the alternative survey and the decedent survey to compare the OCM and comparison groups at baseline.[23] For the trend analysis of EOL care (OCM group only), we used the alternative survey for EOL care measures, because no decedent survey has yet been conducted in the intervention period.

For both analyses, we used an Ordinary Least Square (OLS) regression if the outcome measure was a continuous variable and a logistic regression if the outcome measure was a dichotomous variable. Respondents reported their annual out-of-pocket (OOP) expenses related to cancer care in six expense

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[22] Note that the baseline period for claims analysis ends a year before OCM began; that year is “held out” to ensure that any changes in preparation for OCM do not affect the baseline. The baseline survey, in contrast, took place just as OCM began, because it was not possible to collect data a year earlier.

[23] The comparison group survey and decedent survey will be repeated in intervention wave 9; the comparison group survey will be repeated again in intervention wave 19.

categories, and we used an ordered logit regression to estimate the risk-adjusted share of respondents reporting each expense category. We report the 90 percent confidence intervals for all estimates of interest.

We adjusted all analyses with sampling and nonresponse weights, and clustered the standard errors at the practice level.

Risk Adjustment

For all survey analyses, we included both patient and practice characteristics in risk adjustment for composite scores and for individual questions. Patient characteristics included: age group, gender, race, Medicare and Medicaid dual-eligibility, education level, self-reported overall health, self-reported mental health, whether or not another person helped complete the survey (i.e., proxy respondent), cancer type, comorbidity indicators (represented by aggregate groups of HCC indicators), duration between the start of current chemotherapy and the end of the most recent prior chemotherapy, breast/prostate cancer with long-term oral hormonal therapy only (no other chemotherapy), cancer-related surgery or radiation therapy during the episode, and the calendar month when the episode was triggered. Practice characteristics included: practice size categories (based on the number of oncologist NPIs), academic medical center affiliation, oncology versus multi-specialty practice, practice affiliation with a health system, and hospital ownership.

A.2.2 Patient Survey Instruments and Response Rates

Exhibit 14: Differences among Three Patient Survey Instruments and Periodicity

	Main Survey	Alternative Survey	Trailing Decedent Survey
Target Patient Population	Patients who were alive at the time of sampling (based on latest death records).	Mailed to families of patients who had already died at the time of the survey mailing (based on latest death records).	Mailed to families of patients who were alive at the time of the survey mailing, but died in the following year. Excludes families who responded to the main survey OR who received the alternative survey – no family proxy was surveyed twice.
Survey Questions	Complete set of survey questions except EOL care, including items for composite scoring and current health status.	Same questions as main survey, but (1) no current health status questions (because patient is deceased), and (2) with EOL care questions.	Brief survey containing only EOL care questions.
Survey Addressee	Patient.	“To the Family of….”	“To the Family of….”
Frequency	Every quarterly wave.	Every quarterly wave.	Two quarterly waves (mailed in 2017 and 2019). Each month, until one year after the episode starts, newly deceased patients surveyed.

	Main Survey	Alternative Survey	Trailing Decedent Survey
Marched Comparison Group	Baseline wave; Intervention waves 9 and 19.	Baseline wave; Intervention waves 9 and 19.	Baseline wave; Intervention wave 9.
Role in Scoring for Payment Purpose	Responses from the same items on the main and alternative survey were combined to calculate practice composite scores for payment adjustment. No EOL questions used in scoring or payment adjustment.		Not used for scoring or payment adjustment.

Exhibit 15: Patient Experience Composites and Overall Rating

Composite	Questions
Overall Rating	Number from 0 (worst possible) to 10 (best possible) the patient selects to rate cancer therapy team
Access	Encouraged contact between visits once drug therapy was decided [a]
	Told patient to call immediately about side-effects once drug therapy was decided[a]
	Gave patient clear instructions on how to contact after-hours once drug therapy was decided[a]
	Visits scheduled at convenient times[b]
	Tests and procedures scheduled as soon as needed[b]
	Waited longer than expected for test results[b]
Affective Communication	Showed respect for patient[b]
	Listened carefully to patient[b]
	Was straightforward when talking to patient about therapy[b]
	Spent enough time with patient[b]
Enabling Patient Self-Management	Talked with patient about pain[c]
	Helped patient deal with pain (if a problem)[a]
	Talked with patient about changes in energy[c]
	Helped patient deal with changes in energy (if a problem)[a]
	Talked with patient about emotional problems, such as anxiety or depression[c]
	Helped patient deal with emotional problems (if a problem)[a]
	Talked with patient about additional services to manage cancer care at home[a]
	Talked with patient about things to do to maintain health during treatment[a]
Exchanging Information	Clearly explained how cancer and drug therapy would affect normal activities[a]
	Told patient what the next steps in treatment would be[a]
	Explained test results in a way that was easy to understand[b]
	Explained medications in a way that was easy to understand[a]

Composite	Questions
Shared Decision Making	Talked with patient about reasons to have drug therapy[a]
	Talked with patient about reasons to not have drug therapy[a]
	Asked for patient opinion on whether or not to have drug therapy[a]
	Involved patient in decisions about treatment as much as they wanted[a]
Symptom Management	Helped patient deal with pain (if a problem)[a]
	Helped patient deal with changes in energy levels (if a problem)[a]
	Helped patient deal with emotional problems (if a problem)[a]
	Helped patient deal with nausea/vomiting (if a problem)[a]
	Helped patient deal with difficulty breathing (if a problem)[a]
	Helped patient deal with coughing (if a problem)[a]
	Helped patient deal with constipation/diarrhea (if a problem)[a]
	Helped patient deal with neuropathy (if a problem)[a]

Note: [a] Responses are “Yes, definitely”; “Yes, somewhat”; and “No.”
[b] Responses are “Never,” “Sometimes,” “Usually,” and “Always.”
[c] Responses are “Yes” and “No.”

Exhibit 16: OCM Patient Survey Response Rate

Survey Wave	Main Survey		Alternative Survey		Decedent survey	
	# of Surveys Sent	Response Rate	# of Surveys Sent	Response Rate	# of Surveys Sent	Response Rate
Baseline Wave (OCM Sample)	22,106	48.3%	1,849	39.0%	3,618	40.9%
Baseline Wave (COMP Sample)	16,951[24]	48.2%	1,459	38.9%	2,893	41.5%
Int Wave 1 (OCM Sample)	21,679	47.1%	1,957	37.1%	NA	NA
Int Wave 2 (OCM Sample)	21,042	46.3%	1,688	33.2%	NA	NA
Int Wave 3 (OCM Sample)	22,169	45.0%	1,756	33.8%	NA	NA

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[24] In many studies, treatment and comparison samples include the same number of respondents. Since the OCM patient survey is also used to adjust payments, we sample up to 210 patients per wave from each practice participating in OCM. With this large OCM sample, we are able to survey a smaller comparison sample to achieve our target level of statistical precision.

B. Changes in Episode Characteristics

Exhibit 17: Beneficiary Characteristics among OCM and Comparison Episodes from Baseline to Intervention (PP1)

Demographic Characteristic	Baseline Period Episodes Initiating: (1/2/14-7/1/15)		Intervention Period Episodes Initiating: (7/1/16-1/1/17)	
	OCM N = 349,681	COMP N = 415,483	OCM N = 140,029	COMP N = 164,195
Gender				
Female	60.6%	58.2%	60.8%	58.5%*
Age Bracket				
<65	10.1%	11.3%	9.4%*	10.5%*
65-69	25.0%	24.3%	25.8%*	25.3%*
70-74	23.7%	23.0%	23.9%	23.2%*
75-79	19.1%	18.7%	19.3%	18.9%*
80-84	12.7%	12.9%	12.3%*	12.4%*
85+	9.3%	9.9%	9.3%	9.6%*
Race/Ethnicity				
Non-Hispanic White	82.8%	82.8%	82.6%	82.5%*
Non-Hispanic Black	9.1%	9.3%	8.8%*	8.6%*
Hispanic	4.9%	4.3%	4.8%	4.4%*
Other	3.3%	3.7%	3.7%*	4.4%*
Medicaid Dual Eligibility				
Dual Eligible	14.6%	17.0%	14.2%*	16.3%*

Source: Episode analytic files, 2014–2017.
Notes: * Denotes a statistically significant difference from baseline estimates and intervention estimates at p≤0.10.
OCM: OCM intervention group; COMP: Comparison group.

Exhibit 18: Part D Chemotherapy Utilization among OCM and Comparison Episodes from Baseline to Intervention (PP1)

Characteristic	Baseline Period Episodes Initiating: (1/2/14-7/1/15)				Intervention Period Episodes Initiating: (7/1/16-1/1/17)			
	OCM		COMP		OCM		COMP	
	N	%	N	%	N	%	N	%
Episodes Triggered by Part D Chemotherapy Drug	349,681	38.5%	415,483	39%	140,029	41.6%*	164,195	41.0%*
Part D Episodes with use of Part D Chemotherapy Drug	278,676	55.4%	335,421	55.6%	115,294	57.3%*	136,081	56.5%*

Source: Episode analytic files, 2014–2017.
Notes: * Denotes a statistically significant difference from baseline estimates to intervention estimates at p≤0.10.
OCM: OCM intervention group; COMP: Comparison group.

C. Program Effectiveness Findings: Utilization

Exhibit 19: Estimated OCM Impact for the Number of IP Stays per Episode, by Cancer Bundle (PP1)

Subgroup	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90 % LCL	90 % UCL	Percent Change
Cancer Bundle										
Overall	489,710	579,678	0.427	0.405	0.400	0.383	-0.005	-0.013	0.003	-1.1%
Hormonal-Only Breast Cancer	117,427	134,784	0.111	0.111	0.111	0.110	0.000	-0.006	0.006	0.2%
Non-Hormonal-Only Breast Cancer	51,164	54,674	0.375	0.349	0.361	0.331	0.003	-0.013	0.020	0.9%
Low-Risk Prostate Cancer	39,173	64,393	0.230	0.221	0.215	0.211	-0.005	-0.018	0.009	-2.1%
Lung Cancer	46,878	52,462	0.723	0.666	0.676	0.634	-0.015	-0.039	0.008	-2.1%
Lymphoma	33,709	34,611	0.510	0.462	0.495	0.470	-0.023	-0.049	0.003	-4.5%
Colorectal/Small Intestine Cancer	30,331	33,926	0.581	0.554	0.537	0.528	-0.018	-0.045	0.009	-3.1%
Multiple Myeloma	26,736	29,285	0.525	0.480	0.489	0.462	-0.018	-0.047	0.011	-3.4%
Non-Reconciliation Eligible Cancer	19,950	27,454	0.535	0.510	0.472	0.457	-0.010	-0.044	0.025	-1.8%
High-Risk Prostate Cancer	17,428	21,679	0.458	0.435	0.412	0.383	0.006	-0.030	0.042	1.3%
Chronic Leukemia	17,375	19,884	0.382	0.346	0.365	0.354	-0.026	-0.055	0.003	-6.8%
Cancer Bundle Risk										
Low-Risk Bundles	160,082	206,537	0.148	0.147	0.144	0.143	0.000	-0.006	0.006	0.2%
High-Risk Bundles	329,628	373,141	0.573	0.543	0.528	0.504	-0.006	-0.017	0.006	-1.0%

Source: Episode analytic file, 2014–2017.
Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. The percent change was calculated by dividing the DID estimate by the OCM baseline mean.
OCM: OCM intervention group; COMP: Comparison group; Int.: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 20: Estimated OCM Impact for the Number of ED Visits Not Resulting in IP Stay per Episode, by Cancer Bundle (PP1)

Subgroup	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Cancer Bundle										
Overall	489,710	579,678	0.356	0.362	0.363	0.372	-0.003	-0.010	0.004	-0.9%
Hormonal-Only Breast Cancer	117,427	134,784	0.195	0.204	0.197	0.205	0.000	-0.008	0.009	0.2%
Non-Hormonal-Only Breast Cancer	51,164	54,674	0.351	0.340	0.356	0.359	-0.015	-0.031	0.002	-4.2%
Low-Risk Prostate Cancer	39,173	64,393	0.289	0.292	0.278	0.293	-0.012	-0.029	0.005	-4.3%
Lung Cancer	46,878	52,462	0.493	0.490	0.517	0.503	0.011	-0.012	0.034	2.2%
Lymphoma	33,709	34,611	0.352	0.350	0.357	0.362	-0.008	-0.029	0.013	-2.3%
Colorectal/Small Intestine Cancer	30,331	33,926	0.430	0.421	0.432	0.453	-0.031*	-0.059	-0.002	-7.1%
Multiple Myeloma	26,736	29,285	0.386	0.395	0.380	0.392	-0.004	-0.030	0.023	-0.9%
Non-Reconciliation Eligible Cancer	19,950	27,454	0.401	0.426	0.426	0.438	0.014	-0.014	0.042	3.5%
High-Risk Prostate Cancer	17,428	21,679	0.429	0.438	0.431	0.410	0.030	-0.002	0.063	7.1%
Chronic Leukemia	17,375	19,884	0.345	0.364	0.372	0.358	0.032*	0.001	0.063	9.2%
Cancer Bundle Risk										
Low-Risk Bundles	160,082	206,537	0.219	0.230	0.224	0.236	-0.001	-0.009	0.007	-0.5%
High-Risk Bundles	329,628	373,141	0.420	0.428	0.438	0.448	-0.003	-0.012	0.007	-0.6%

Source: Episode analytic file, 2014–2017.
Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.
OCM: OCM intervention group; COMP: Comparison group; Int.: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 21: Estimated OCM Impact for the Number of ED Visits Resulting in IP Stay per Episode, by Cancer Bundle (PP1)

Subgroup	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Cancer Bundle										
Overall	489,710	579,678	0.307	0.296	0.275	0.277	-0.013***	-0.020	-0.006	-4.2%
Hormonal-Only Breast Cancer	117,427	134,784	0.074	0.074	0.070	0.071	-0.001	-0.006	0.005	-1.0%
Non-Hormonal-Only Breast Cancer	51,164	54,674	0.277	0.266	0.254	0.248	-0.006	-0.021	0.009	-2.2%
Low-Risk Prostate Cancer	39,173	64,393	0.176	0.170	0.157	0.162	-0.010	-0.023	0.002	-5.8%
Lung Cancer	46,878	52,462	0.573	0.532	0.508	0.510	-0.042***	-0.063	-0.021	-7.4%
Lymphoma	33,709	34,611	0.336	0.315	0.307	0.310	-0.024*	-0.045	-0.004	-7.2%
Colorectal/Small Intestine Cancer	30,331	33,926	0.386	0.374	0.338	0.357	-0.030**	-0.055	-0.005	-7.7%
Multiple Myeloma	26,736	29,285	0.369	0.343	0.325	0.325	-0.026*	-0.050	-0.002	-7.0%
Non-Reconciliation Eligible Cancer	19,950	27,454	0.388	0.379	0.325	0.335	-0.020	-0.048	0.009	-5.0%
High-Risk Prostate Cancer	17,428	21,679	0.365	0.355	0.311	0.299	0.003	-0.030	0.036	0.9%
Chronic Leukemia	17,375	19,884	0.279	0.259	0.268	0.269	-0.022	-0.046	0.001	-8.0%
Cancer Bundle Risk										
Low-Risk Bundles	160,082	206,537	0.104	0.104	0.098	0.101	-0.002	-0.007	0.003	-1.9%
High-Risk Bundles	329,628	373,141	0.407	0.394	0.368	0.370	-0.016**	-0.026	-0.005	-3.8%

Source: Episode analytic file, 2014–2017.
Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.
OCM: OCM intervention group; COMP: Comparison group; Int.: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 22: Estimated OCM Impact for Post-Acute Care Utilization per Episode (PP1)

	# of Episodes		OCM		COMP		Impact Estimates			
Measure	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
SNF Services										
Occurrence of SNF Stay	489,710	579,678	0.051	0.049	0.048	0.047	-0.001	-0.003	0.001	-2.2%
# of SNF Stays	489,710	579,678	0.067	0.064	0.063	0.062	-0.002	-0.004	0.001	-2.3%
# of SNF Days	24,721	27,806	28.141	26.242	27.802	25.836	0.067	-0.587	0.722	0.2%
Home Health Services										
Occurrence of Home Health Agency Service	489,710	579,678	15.3%	14.5%	15.1%	14.6%	-0.3%	-0.6%	0.1%	-1.7%
# of 60-Day Home Health Agency Payment Periods	489,710	579,678	0.291	0.279	0.288	0.280	-0.004	-0.012	0.004	-1.3%

Source: Episode analytic file, 2014–2017.

Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. DID impact estimates for "occurrence" outcomes represent a percentage point change. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.

OCM: OCM intervention group; COMP: Comparison group.

Int.: Intervention period

Exhibit 23: Estimated OCM Impact for Part B Service Utilization per Episode (PP1)

Measure	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Evaluation & Management Services										
# of Cancer-Related E&M Services	489,710	579,678	5.696	5.404	5.412	5.185	-0.064	-0.163	0.035	-1.1%
Imaging Services										
Occurrence of Any Part B Imaging Service	489,710	579,678	87.1%	86.9%	87.6%	87.4%	0.1%	-0.2%	0.4%	0.1%
# of Part B Standard and Other Imaging Services	489,710	579,678	4.472	4.072	4.438	4.065	-0.027	-0.081	0.027	-0.6%
# of Part B Advanced Imaging Services	489,710	579,678	3.451	3.467	3.532	3.562	-0.014	-0.069	0.040	-0.4%
Radiation Therapy Services										
# of Part B Radiation Therapy Services	489,710	579,678	4.928	4.215	5.294	4.555	0.027	-0.176	0.229	0.5%
Outpatient Rehabilitation Therapy Services										
Occurrence of Part B Outpatient Rehabilitation Therapy Service	489,710	579,678	8.4%	8.8%	8.4%	9.2%	-0.3%	-0.6%	0.0%	-3.3%
# of Part B Outpatient Rehabilitation Therapy Services	489,710	579,678	1.688	1.767	1.690	1.797	-0.028	-0.111	0.054	-1.7%

Source: Episode analytic file, 2014–2017.
Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. DID impact estimates for “occurrence” outcomes represent a percentage point change. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.
OCM: OCM intervention group; COMP: Comparison group.
Int.: Intervention period

D. Program Effectiveness Findings: Cost of Care

Exhibit 24: Estimated OCM Impact for TCOC per Episode, by Cancer Bundle (PP1)

Subgroup	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Cancer Bundle										
Overall	489,710	579,678	$27,482	$30,370	$27,192	$30,191	-$111	-$366	$144	-0.4%
Hormonal-Only Breast Cancer	117,427	134,784	$5,286	$5,411	$5,344	$5,463	$6	-$142	$154	0.1%
Non-Hormonal-Only Breast Cancer	51,164	54,674	$33,606	$37,521	$32,655	$37,302	-$731**	-$1,308	-$154	-2.2%
Low-Risk Prostate Cancer	39,173	64,393	$10,933	$11,188	$10,659	$11,183	-$269	-$610	$72	-2.5%
Lung Cancer	46,878	52,462	$37,368	$45,148	$36,678	$44,754	-$296	-$994	$403	-0.8%
Lymphoma	33,709	34,611	$41,550	$43,725	$41,433	$44,846	-$1,238**	-$2,089	-$388	-3.0%
Colorectal/Small Intestine Cancer	30,331	33,926	$35,749	$34,811	$34,364	$34,110	-$684	-$1,475	$107	-1.9%
Multiple Myeloma	26,736	29,285	$50,066	$61,139	$50,264	$61,186	$151	-$963	$1,265	0.3%
Non-Reconciliation Eligible Cancer	19,950	27,454	$34,700	$40,202	$33,424	$39,504	-$579	-$1,795	$638	-1.7%
High-Risk Prostate Cancer	17,428	21,679	$41,351	$44,048	$41,048	$43,348	$398	-$695	$1,491	1.0%
Chronic Leukemia	17,375	19,884	$42,476	$46,008	$42,169	$46,129	-$427	-$1,483	$628	-1.0%
Cancer Bundle Risk										
Low-Risk Bundles	160,082	206,537	$6,953	$7,145	$7,009	$7,277	-$75	-$209	$59	-1.1%
High-Risk Bundles	329,628	373,141	$38,239	$42,378	$37,695	$42,207	-$373	-$758	$11	-1.0%

Source: Episode analytic file, 2014–2017.

Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.

OCM: OCM intervention group; COMP: Comparison group; Int.: Intervention period

*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 25: Estimated OCM Impact for Part A Cost Components per Episode (PP1)

Measure	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	% Change
Part A IP Costs	489,710	579,678	$3,837	$3,866	$3,541	$3,587	-$18	-$102	$65	-0.5%
Part A 30-Day Readmission Costs	489,710	579,678	$1,007	$997	$906	$915	-$19	-$61	$23	-1.9%
Part A 30-Day Unplanned Readmission Costs	489,710	579,678	$848	$832	$775	$773	-$14	-$49	$21	-1.7%
Part A SNF Costs	489,710	579,678	$659	$631	$623	$607	-$12	-$40	$15	-1.8%
Part A Home Health Agency Costs	489,710	579,678	$647	$617	$645	$630	-$16	-$34	$2	-2.5%
Part A IP Rehab Costs	489,710	579,493	$205	$217	$167	$191	-$13	-$32	$6	-6.2%
Part A Long-Term Care Costs	489,710	579,151	$121	$105	$113	$90	$7	-$10	$24	5.7%
Part A Hospice Costs	489,710	579,678	$452	$477	$413	$430	$7	-$11	$26	1.6%

Source: Episode analytic file, 2014–2017.

Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.
OCM: OCM intervention group; COMP: Comparison group.
Int.: Intervention period

Exhibit 26: Estimated OCM Impact for IP Costs per Episode, by Cancer Bundle (PP1)

Subgroup	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Cancer Bundle										
Overall	489,710	579,678	$3,794	$3,818	$3,578	$3,624	-$22	-$108	$64	-0.6%
Hormonal-Only Breast Cancer	117,427	134,784	$896	$968	$902	$954	$20	-$40	$80	2.3%
Non-Hormonal-Only Breast Cancer	51,164	54,674	$2,919	$2,859	$2,818	$2,665	$93	-$70	$256	3.2%
Low-Risk Prostate Cancer	39,173	64,393	$1,957	$1,986	$1,792	$1,854	-$33	-$177	$110	-1.7%
Lung Cancer	46,878	52,462	$5,968	$5,806	$5,517	$5,475	-$120	-$347	$106	-2.0%
Lymphoma	33,709	34,611	$4,861	$4,554	$4,850	$4,837	-$294	-$655	$67	-6.0%
Colorectal/Small Intestine Cancer	30,331	33,926	$5,146	$5,087	$4,800	$4,895	-$154	-$461	$154	-3.0%
Multiple Myeloma	26,736	29,285	$5,337	$5,411	$5,133	$5,137	$71	-$350	$491	1.3%
Non-Reconciliation Eligible Cancer	19,950	27,454	$4,726	$4,786	$4,151	$4,339	-$128	-$553	$297	-2.7%
High-Risk Prostate Cancer	17,428	21,679	$3,522	$3,594	$3,337	$3,175	$233	-$113	$579	6.6%
Chronic Leukemia	17,375	19,884	$3,619	$3,398	$3,286	$3,459	-$394*	-$788	-$1	-10.9%
Cancer Bundle Risk										
Low-Risk Bundles	160,082	206,537	$1,236	$1,319	$1,185	$1,251	$16	-$43	$76	1.3%
High-Risk Bundles	329,628	373,141	$5,193	$5,191	$4,763	$4,800	-$40	-$162	$83	-0.8%

Source: Episode analytic file, 2014–2017.

Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.

OCM: OCM intervention group; COMP: Comparison group; Int.: Intervention period

*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 27: Estimated OCM Impact for Part B Cost Components per Episode (PP1)

Measure	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	% Change
Part B Imaging Costs	489,710	579,678	$822	$791	$829	$811	-$14	-$30	$3	-1.7%
Part B Lab Costs	489,710	579,678	$479	$477	$430	$427	$0	-$12	$12	0.1%
Part B Drug Costs	489,710	579,678	$10,115	$11,651	$9,767	$11,288	$14	-$160	$189	0.1%
Part B E&M Costs	489,710	579,678	$1,284	$1,227	$1,215	$1,189	-$31***	-$51	-$12	-2.4%
Part B Other Institutional Costs	489,710	579,678	$1,385	$1,437	$1,551	$1,636	-$34	-$83	$15	-2.4%
Part B Other Non-Institutional Costs	489,710	579,678	$1,249	$1,184	$1,211	$1,135	$12	-$9	$32	0.9%

Source: Episode analytic file, 2014–2017.

Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean.

OCM: OCM intervention group; COMP: Comparison group.

Int.: Intervention period

*p≤0.10, **p≤0.05, ***p≤0.01

Exhibit 28: Estimated OCM Impact for Part D Chemotherapy Costs per Episode, by Cancer Bundle (PP1)

Subgroup	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Cancer Bundle										
Overall	393,970	471,502	$4,658	$6,733	$4,775	$6,552	$298***	$169	$426	6.4%
Hormonal-Only Breast Cancer	117,063	134,377	$31	$32	$30	$28	$3**	$1	$5	9.1%
Low-Risk Prostate Cancer	24,579	41,507	$70	$102	$82	$74	$40**	$8	$72	57.7%
Lung Cancer	34,049	39,357	$3,521	$4,676	$4,044	$5,621	-$422*	-$819	-$26	-12.0%
Lymphoma	23,833	25,226	$3,340	$5,669	$3,868	$6,491	-$293	-$913	$326	-8.8%
Colorectal/Small Intestine Cancer	21,585	24,812	$1,462	$2,127	$1,413	$1,901	$178	-$121	$477	12.2%
Multiple Myeloma	22,235	24,648	$23,367	$33,804	$24,383	$33,835	$985	-$59	$2,029	4.2%
Non-Reconciliation Eligible Cancer	16,127	22,347	$10,780	$14,619	$9,461	$13,316	-$15	-$1,017	$987	-0.1%
High-Risk Prostate Cancer	14,820	18,837	$18,215	$19,516	$18,410	$18,898	$813*	$60	$1,567	4.5%
Chronic Leukemia	15,225	17,678	$19,082	$26,171	$19,736	$25,387	$1,438***	$540	$2,336	7.5%
Cancer Bundle Risk										
Low-Risk Bundles	144,053	180,766	$37	$43	$42	$38	$10**	$3	$16	26.9%
High-Risk Bundles	249,917	290,736	$7,496	$10,721	$7,571	$10,428	$368***	$161	$574	4.9%

Source: Episode analytic file, 2014–2017.

Notes: All measures were calculated at the episode level. Means and DID impact estimates are regression-adjusted. LCL and UCL refer to lower confidence limit and upper confidence limit, respectively. Percent change was calculated by dividing the DID estimate by the OCM baseline mean. Trends for Part D chemotherapy costs for hon-hormonal only breast cancer were not parallel in the two groups during the baseline and is therefore excluded from this table.

OCM: OCM intervention group; COMP: Comparison group; Int.: Intervention period

*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 29: Estimated Maximum MEOS per Episode, by Cancer Bundle (PP1)

Cancer Bundle	# of Episodes	Mean
Overall	140,029	$904
Hormonal-Only Breast Cancer	34,769	$938
Non-Hormonal-Only Breast Cancer	14,109	$912
Lung Cancer	13,300	$851
Low-Risk Prostate Cancer	11,365	$922
Lymphoma	9,122	$914
Colorectal/Small Intestine Cancer	7,843	$892
Multiple Myeloma	7,837	$916
Non-Reconciliation Eligible Cancer	6,425	$884
Chronic Leukemia	4,965	$928
High-Risk Prostate Cancer	4,899	$905
Pancreatic Cancer	3,135	$819
Ovarian Cancer	2,613	$894
Gastro/Esophageal Cancer	2,144	$845
Endocrine Tumor	2,124	$909
MDS	2,122	$884
Head and Neck Cancer	1,994	$861
Female GU Cancer Other than Ovary	1,950	$896
High-Risk Bladder Cancer	1,731	$863
Kidney Cancer	1,539	$883
Liver Cancer	1,451	$827
Malignant Melanoma	1,247	$873
Low-Risk Bladder Cancer	1,037	$934
CNS Tumor	965	$829
Acute Leukemia	935	$847
Anal Cancer	408	$891

Source: Episode analytic file, 2014–2017.

E. Program Effectiveness Findings: Enhanced Oncology Service

E.1 Detailed Results from Patient Survey Analysis

Exhibit 30: Adjusted Self-Reported Out-of-Pocket Expense, Baseline Wave (Apr.–Sept. 2016)

Expense Category	Adjusted Mean	
	OCM N=8,616	COMP N=6,668
Under $100	24.1%	23.4%
$100–$499	28.5%	28.2%
$500–$999	14.5%	14.6%
$1,000–$1,999	11.2%	11.3%
$2,000–$4,999	12.6%	13.0%
$5,000 or more	9.2%	9.5%

Source: OCM patient survey.
Note: OCM: OCM intervention group; COMP: Comparison group

Exhibit 31: Adjusted Self-Reported Out-of-Pocket Expense, by OCM Patient Survey Wave (OCM Respondents Only)

Expense Category	Adjusted Mean			
	Baseline Wave (Apr. 2016–Sept. 2016) N=8,616	Int. Wave 1 (Jul. 2016–Dec. 2016) N=8,475	Int. Wave 2 (Oct. 2016–Mar. 2017) N=7,925	Int. Wave 3 (Jan. 2017–Jun. 2017) N=8,118
Under $100	23.5%	21.8%	21.7%	23.6%
$100–$499	28.6%	28.0%	27.9%	28.6%
$500–$999	14.3%	14.5%	14.5%	14.3%
$1,000–$1,999	11.5%	11.9%	12.0%	11.5%
$2,000–$4,999	12.5%	13.3%	13.3%	12.5%
$5,000 or more	9.5%	10.5%	10.5%	9.5%

Source: OCM patient survey.
Note: Int.: Intervention period

Exhibit 32: Adjusted Measures on Access to Care, OCM Patient Survey Baseline Wave (Apr.–Sept. 2016)

Measure	# of Respondents		Adjusted Mean		Difference in Adjusted Mean		
					Difference	90% CLs	
	OCM	COMP	OCM	COMP		LCL	UCL
Composite Score: Access to Care (on a Scale of 0–10)	11,100	8,538	8.87	8.84	0.02	-0.02	0.07
Cancer Therapy Team Definitely Encouraged Patient to Contact Them with Questions between Visits	10,902	8,382	82.7%	82.0%	0.7%	-0.3%	1.8%
Cancer Therapy Team Definitely Told Patient to Call Them Immediately for Certain Symptoms or Side Effects	10,928	8,414	84.4%	83.9%	0.5%	-0.4%	1.5%
Cancer Therapy Team Definitely Gave Patient Clear Instructions about How to Contact Them Outside of Regular Office Hours	10,939	8,437	73.8%	72.8%	1.0%	-0.4%	2.3%
Office Visits Were Always Scheduled at Times that Were Convenient for the Patient	10,388	7,973	74.8%	74.3%	0.5%	-0.9%	1.9%
Blood Tests, X-Rays, Scans, or Other Procedures Were Always Done as Soon as the Patient or Doctor Thought the Patient Needed Them	10,251	7,864	86.0%	87.3%	-1.3%**	-2.2%	-0.4%
Patient Never Had to Wait Longer for Test Results Longer Than Expected	10,903	8,374	79.8%	80.5%	-0.8%	-2.0%	0.5%

Source: OCM patient survey.
Notes: OCM: OCM intervention group; COMP: Comparison group
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 33: Adjusted Measures on Access to Care, by OCM Patient Survey Wave (OCM Respondents Only)

Measure	Adjusted Mean				Linear Time Trend Estimates		
	Baseline Wave	Int. Wave 1	Int. Wave 2	Int. Wave 3	Point Estimate	90 % CLs	
	(Apr. 2016–Sept. 2016)	(Jul. 2016–Dec. 2016)	(Oct. 2016–Mar. 2017)	(Jan. 2017–Jun. 2017)		LCL	UCL
Composite Score: Access to Care (on a Scale of 0–10)	8.87	8.79	8.79	8.80	-0.02	-0.06	0.01
Cancer Therapy Team Definitely Encouraged Patient to Contact Them with Questions between Visits	82.7%	81.2%	81.8%	81.3%	-0.4%	-0.9%	0.2%
Cancer Therapy Team Definitely Told Patient to Call Them Immediately for Certain Symptoms or Side Effects	84.3%	82.7%	83.3%	83.0%	-0.3%	-0.7%	0.03%
Cancer Therapy Team Definitely Gave Patient Clear Instructions about How to Contact Them Outside of Regular Office Hours	74.1%	71.8%	71.4%	73.1%	-0.4%	-1.0%	0.3%
Office Visits Were Always Scheduled at Times That Were Convenient for the Patient	74.2%	72.9%	75.8%	73.0%	-0.1%	-0.6%	0.5%
Blood Tests, X-Rays, Scans, or Other Procedures Were Always Done as Soon as the Patient or Doctor Thought the Patient Needed Them	85.9%	85.1%	86.2%	84.8%	-0.2%	-0.5%	0.1%
Patient Never Had To Wait Longer for Test Results Than Expected	79.9%	79.7%	81.1%	79.7%	0.1%	-0.3%	0.4%

Source: OCM patient survey.
Notes: Int.: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 34: Adjusted Overall Rating of Cancer Therapy Team, OCM Patient Survey Baseline Wave (Apr.–Sep. 2016)

Measure	# of Respondents		Adjusted Mean		Difference in Adjusted Mean		
					Difference	90 % CLs	
	OCM	COMP	OCM	COMP		LCL	UCL
Patient's Overall Rating of Cancer Therapy Team (on a Scale of 0–10)	10,442	8,071	9.28	9.29	-0.01	-0.05	0.03

Source: OCM patient survey.
Notes: OCM: OCM intervention group; COMP: Comparison group
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 35: Adjusted Overall Rating of Cancer Therapy Team, by OCM Patient Survey Wave (OCM Respondents Only)

Measure	Adjusted Mean				Linear Time Trend Estimates		
	Baseline Wave	Int. Wave 1	Int. Wave 2	Int. Wave 3	Point Estimate	90% CLs	
	(Apr. 2016–Sept. 2016)	(Jul. 2016–Dec. 2016)	(Oct. 2016–Mar. 2017)	(Jan. 2017–Jun. 2017)		LCL	UCL
Patient's Overall Rating of Cancer Therapy Team (on a Scale of 0–10)	9.27	9.22	9.26	9.20	-0.02	-0.04	0.01

Source: OCM patient survey.
Notes: Int.: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 36: Adjusted Measures on Care Coordination, OCM Patient Survey Baseline Wave (Apr.–Sept. 2016)

Measure	# of Respondents		Adjusted Mean		Difference in Adjusted Mean		
					Difference	90 % CLs	
	OCM	COMP	OCM	COMP		LCL	UCL
Cancer Therapy Team Always Know the Important Information about Patient's Medical History	10,878	8,365	71.8%	72.3%	-0.5%	-1.8%	0.9%
Cancer Therapy Team Never Delayed Patients' Cancer Treatment or a Decision on Treatment because of Missing Test Results/Reports from Other Health Professionals	10,840	8,333	88.4%	89.0%	-0.6%	-1.4%	0.2%
Patient Never Received Conflicting Information about Care from Different Members of Cancer Therapy Team	10,873	8,350	91.9%	92.1%	-0.2%	-0.9%	0.5%

Source: OCM patient survey.
Notes: OCM: OCM intervention group; COMP: Comparison group
*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 37: Adjusted Measures on Care Coordination, by OCM Patient Survey Wave (OCM Respondents Only)

Measure	Adjusted Mean				Linear Time Trend Estimates		
	Baseline Wave	Int. Wave 1	Int. Wave 2	Int. Wave 3	Point Estimate	90% CLs	
	(Apr. 2016–Sept. 2016)	(Jul. 2016–Dec. 2016)	(Oct. 2016–Mar. 2017)	(Jan. 2017–Jun. 2017)		LCL	UCL
Cancer Therapy Team Always Know the Important Information about Patient's Medical History	71.9%	69.6%	69.4%	67.8%	-1.3%**	-2.1%	-0.4%
Cancer Therapy Team Never Delayed Patients' Cancer Treatment or a Decision on Treatment because of Missing Test Results/Reports from Other Health Professionals	88.2%	88.8%	89.7%	88.1%	0.1%	-0.2%	0.3%
Patient Never Received Conflicting Information about Care from Different Members of Cancer Therapy Team	92.3%	91.5%	92.4%	92.3%	0.1%	-0.1%	0.2%

Source: OCM patient survey.
Notes: Int.: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01.

E.2 Detailed Results from Practice Transformation Plans Analysis

The exhibits in this section show results from the descriptive analyses of 2017 Practice Transformation Plans (PTP) responses (summary statistics), 2017 PTP responses stratified by practice characteristics (number of oncologists, ownership, and academic affiliation), and comparisons of the 2016 and 2017 responses to assess changes over time.

Exhibit 38: Percent of Practices Reporting Using Practice Transformation Approaches, Results from 2017 Practice Transformation Plans

Measure	Percent of OCM Practices Using Approach (N=183)
Used OCM Revenue to Hire Additional Staff	89.6
Care Coordination	
Performing Medication Reconciliation with Outside Clinicians	60.7
Performing Medication Reconciliation with Patients during Care Transitions	93.4
Conducting Individualized Education with Patients for All Medications	86.3
Tracking Patients Referred to Other Specialists through Entire Process	62.3
Participating in Health Information Exchange with Other Practices	72.1
Scheduled meetings for management of complex patients on a weekly basis	64.5
Use of Risk Stratification	
Assigning a Risk Status to Each Patient	30.1
Assigning Patients to a Risk Cohort	27.3
Stratifying Patients into Actionable Risk Cohorts	45.4
Referral coordination and management	
Preparing Patients for Referral or Other Specialty Consultation	89.1
Using systematic criteria for referral	63.9
Using structured referral notes	63.9
Following a structured process for routine and timely follow-up on hospitalizations, ED visits, and stays in other institutional settings	64.5
Using structured communications (such as forms or standard reports) to communicate across care settings to enable information flow and seamless transitions	73.2
Sharing data with clinical stakeholders outside the practice to engage them in efforts to improve care and patient experience and reduce cost	41.0
Maintaining written agreements with care partners (e.g., care coordination agreements, care compacts, or referral agreements)	30.1
Patient Provider Communication	
Providing Patient Portal with Access to Medical Information and Documents	94.5
Providing Secure Email of Medical Information and Documents	78.7
Use Remote Monitoring Technology Data to Promote Change in Patient Health	10.9
Employing Telephone Visits	30.6
Offering Two-Way Video Visits	10.9
Using Patient Decision Aids, Such as Option Grids or Video Decision Aids	25.7
Discussing Treatment Options, Including Palliative Care, Early	86.3

Measure	Percent of OCM Practices Using Approach (N=183)
Enhanced Oncology Services	
Providing Clinicians Outside the Practice Access to Patients' Medical Records	56.3
Offering Extended Evening Hours	37.7
Offering Weekend Hours	36.1
Offering Same-Day Appointments	95.1
Using Call Center Triage	65.6
Access to home health care and palliative care	
Integrating palliative care into routine cancer care (e.g., via referral to specialist)	72.7
Providing access and/or referral to home hospice services	98.9
Coordinating care with home health agencies	95.1
Core Functions of Patient Navigation	
Coordinating Appointments with Clinicians Inside and Outside Practice	85.2
Maintaining Communication with Patients and Their Families	77.0
Ensuring that Appropriate Medical Records are Available at Appointments	88.5
Arranging Language Translation or Interpretation Services	89.6
Facilitating Connections to Follow-Up Services	78.7
Providing Access to Clinical Trials	72.1
Building Partnerships with Local Agencies and Groups	65.6
Facilitating Financial Support	79.8
Arranging Transportation	54.6
Arranging Child or Elder Care	24.6
Helping with Paperwork	71.0
Using Data for CQI	
Review of Data with Practice on a Quarterly Basis: Quality of Care	85.8
Review of Data with Practice on a Quarterly Basis: Utilization	80.3
Review of Data with Practice on a Quarterly Basis: Patient Experience	78.7
Employing a Formal Model of Quality Improvement in Your Practice	62.3
Sharing Team/Provider-Identified Data within the Practice	77.6
Strategies to Support Adherence to National Guidelines/Standardize Treatment Approaches	
Holding Multidisciplinary Treatment Planning Conferences or Workshops	92.3
Integrating Clinical Decision Support in Documentation Workflow	78.1
CDS is Integrated with the EHR	66.7
CDS is Integrated with the Chemotherapy Electronic Order Management System	55.7

Source: OCM Practice 2017 responses to the Practice Transformation Plans.

Exhibit 39: Percent of Practices Reporting Using Practice Transformation Approaches, Stratified by Practice Size, Results from 2017 Practice Transformation Plans

Measure	Number of Oncologists and Urologists, Percent of OCM Practices					P-Value from Chi-Squared Test
	1–4 Onc./Uro. n=33	10–19 Onc./Uro. n=40	20–49 Onc./Uro. n=50	5–9 Onc./Uro. n=38	50+ Onc./Uro. n=22	
Used OCM Revenue to Hire Additional Staff	84.8	85.0	90.0	94.7	95.5	0.462
Care Coordination						
Performing Medication Reconciliation with Outside Clinicians	66.7	62.5	60.0	57.9	54.5	0.905
Performing Medication Reconciliation with Patients during Care Transitions	93.9	95.0	92.0	89.5	100.0	0.581
Conducting Individualized Education with Patients for All Medications	84.8	95.0	76.0	89.5	90.9	0.097
Tracking Patients Referred to Other Specialists through Entire Process	78.8	62.5	58.0	57.9	54.5	0.278
Participating in Health Information Exchange with Other Practices	60.6	62.5	76.0	81.6	81.8	0.130
Scheduled meetings for management of complex patients on a weekly basis	51.5	62.5	66.0	68.4	77.3	0.358
Use of Risk Stratification						
Assigning a Risk Status to Each Patient	21.2	40.0	26.0	28.9	36.4	0.414
Assigning Patients to a Risk Cohort	15.2	40.0	20.0	26.3	40.9	0.058
Stratifying Patients into Actionable Risk Cohorts	42.4	57.5	40.0	42.1	45.5	0.519
Referral Coordination and Management						
Preparing Patients for Referral or Other Specialty Consultation	87.9	97.5	82.0	86.8	95.5	0.156
Using systematic criteria for referral	75.8	62.5	60.0	55.3	72.7	0.361
Using structured referral notes	66.7	75.0	58.0	55.3	68.2	0.354
Following a structured process for routine and timely follow-up on hospitalizations, ED visits, and stays in other institutional settings	72.7	67.5	66.0	57.9	54.5	0.582
Using structured communications (such as forms or standard reports) to communicate across care settings to enable information flow and seamless transitions	75.8	87.5	64.0	68.4	72.7	0.142
Sharing data with clinical stakeholders outside the practice to engage them in efforts to improve care and patient experience and reduce cost	33.3	42.5	42.0	36.8	54.5	0.592

Measure	Number of Oncologists and Urologists, Percent of OCM Practices					P-Value from Chi-Squared Test
	1–4 Onc./Uro. n=33	10–19 Onc./Uro. n=40	20–49 Onc./Uro. n=50	5–9 Onc./Uro. n=38	50+ Onc./Uro. n=22	
Maintaining written agreements with care partners (e.g., care coordination agreements, care compacts, or referral agreements)	30.3	27.5	20.0	31.6	54.5	0.065
Patient Provider Communication						
Providing Patient Portal with Access to Medical Information and Documents	84.8	92.5	100.0	94.7	100.0	0.033
Providing Secure Email of Medical Information and Documents	63.6	80.0	76.0	89.5	86.4	0.087
Use Remote Monitoring Technology Data to Promote Change in Patient Health	9.1	7.5	6.0	18.4	18.2	0.265
Employing Telephone Visits	33.3	27.5	22.0	36.8	40.9	0.429
Offering Two-Way Video Visits	3.0	7.5	10.0	13.2	27.3	0.064
Using Patient Decision Aids, Such as Option Grids or Video Decision Aids	36.4	25.0	18.0	26.3	27.3	0.468
Discussing Treatment Options, Including Palliative Care, Early	93.9	92.5	84.0	73.7	90.9	0.069
Enhanced Oncology Services						
Providing Clinicians Outside the Practice Access to Patients' Medical Records	60.6	47.5	54.0	52.6	77.3	0.218
Offering Extended Evening Hours	30.3	42.5	32.0	34.2	59.1	0.175
Offering Weekend Hours	30.3	25.0	24.0	44.7	77.3	0.000
Offering Same-Day Appointments	90.9	92.5	100.0	92.1	100.0	0.182
Using Call Center Triage	66.7	75.0	64.0	57.9	63.6	0.613
Access to home health & palliative care						
Integrating palliative care into routine cancer care	72.7	65.0	74.0	78.9	72.7	0.739
Providing access and/or referral to home hospice services	100.0	100.0	98.0	100.0	95.5	0.402
Coordinating care with home health agencies	97.0	97.5	94.0	94.7	90.9	0.790
Core Functions of Patient Navigation						
Coordinating Appointments with Clinicians Inside and Outside Practice	90.9	90.0	74.0	89.5	86.4	0.128
Maintaining Communication with Patients and Their Families	72.7	80.0	80.0	71.1	81.8	0.764
Ensuring that Appropriate Medical Records are Available at Appointments	84.8	92.5	90.0	86.8	86.4	0.848

Measure	Number of Oncologists and Urologists, Percent of OCM Practices					P-Value from Chi-Squared Test
	1–4 Onc./Uro. n=33	10–19 Onc./Uro. n=40	20–49 Onc./Uro. n=50	5–9 Onc./Uro. n=38	50+ Onc./Uro. n=22	
Arranging Language Translation or Interpretation Services	78.8	82.5	96.0	94.7	95.5	0.034
Facilitating Connections to Follow-Up Services	72.7	80.0	84.0	76.3	77.3	0.784
Providing Access to Clinical Trials	54.5	70.0	82.0	63.2	95.5	0.005
Building Partnerships with Local Agencies and Groups	57.6	65.0	68.0	68.4	68.2	0.866
Facilitating Financial Support	84.8	80.0	80.0	78.9	72.7	0.874
Arranging Transportation	39.4	60.0	60.0	52.6	59.1	0.358
Arranging Child or Elder Care	6.1	22.5	30.0	28.9	36.4	0.060
Helping with Paper Work	75.8	70.0	72.0	68.4	68.2	0.961
Using Data for CQI						
Review of Data with Practice on a Quarterly Basis: Quality of Care	84.8	87.5	80.0	89.5	90.9	0.664
Review of Data with Practice on a Quarterly Basis: Utilization	81.8	85.0	74.0	76.3	90.9	0.432
Review of Data with Practice on a Quarterly Basis: Patient Experience	69.7	72.5	78.0	89.5	86.4	0.205
Employing a Formal Model of Quality Improvement in Your Practice	39.4	62.5	64.0	68.4	81.8	0.021
Sharing Team/Provider-Identified Data within the Practice	75.8	77.5	76.0	76.3	86.4	0.887
Strategies to Support Adherence to National Guidelines/Standardize Treatment Approaches						
Holding Multidisciplinary Treatment Planning Conferences or Workshops	87.9	92.5	96.0	94.7	86.4	0.509
Integrating Clinical Decision Support in Documentation Workflow	75.8	85.0	78.0	81.6	63.6	0.382
CDS is Integrated with the her	66.7	62.5	68.0	71.1	63.6	0.942
CDS is Integrated with the Chemotherapy Electronic Order Management System	57.6	52.5	52.0	60.5	59.1	0.917

Source: OCM Practice 2017 responses to the Practice Transformation Plans.

Exhibit 40: Percent of Practices Reporting Using Practice Transformation Approaches, Stratified by Practice Ownership, Results from 2017 Practice Transformation Plans

Measure	Independent, Percent of OCM Practices n=95	Owned by Hospital or Health System, Percent of OCM Practices n=88	P-Value from Chi-Squared Test
Used OCM Revenue to Hire Additional Staff	92.6	86.4	0.165
Care Coordination			
Performing Medication Reconciliation with Outside Clinicians	55.8	65.9	0.161
Performing Medication Reconciliation with Patients during Care Transitions	92.6	94.3	0.645
Conducting Individualized Education with Patients for All Medications	85.3	87.5	0.660
Tracking Patients Referred to Other Specialists through Entire Process	65.3	59.1	0.389
Participating in Health Information Exchange with Other Practices	70.5	73.9	0.615
Scheduled meetings for management of complex patients on a weekly basis	59.5	90.0	0.001
Use of Risk Stratification			
Assigning a Risk Status to Each Patient	29.5	30.7	0.859
Assigning Patients to a Risk Cohort	27.4	27.3	0.988
Stratifying Patients into Actionable Risk Cohorts	43.2	47.7	0.535
Referral Coordination and Management			
Preparing Patients for Referral or Other Specialty Consultation	89.5	88.6	0.856
Using systematic criteria for referral	63.2	64.8	0.820
Using structured referral notes	64.2	63.6	0.936
Following a structured process for routine and timely follow-up on hospitalizations, ED visits, and stays in other institutional settings	66.3	62.5	0.590
Using structured communications (such as forms or standard reports) to communicate across care settings to enable information flow and seamless transitions	70.5	76.1	0.392
Sharing data with clinical stakeholders outside the practice to engage them in efforts to improve care and patient experience and reduce cost	34.7	47.7	0.074
Maintaining written agreements with care partners (e.g., care coordination agreements, care compacts, or referral agreements)	31.6	28.4	0.640
Patient Provider Communication			
Providing Patient Portal with Access to Medical Information and Documents	95.8	93.2	0.438
Providing Secure Email of Medical Information and Documents	75.8	81.8	0.320
Use Remote Monitoring Technology Data to Promote Change in Patient Health	10.5	11.4	0.856
Employing Telephone Visits	29.5	31.8	0.731

Measure	Independent, Percent of OCM Practices n=95	Owned by Hospital or Health System, Percent of OCM Practices n=88	P-Value from Chi-Squared Test
Offering Two-Way Video Visits	9.5	12.5	0.512
Using Patient Decision Aids, Such as Option Grids or Video Decision Aids	28.4	22.7	0.378
Discussing Treatment Options, including Palliative Care, Early	84.2	88.6	0.384
Enhanced Oncology Services			
Providing Clinicians Outside the Practice Access to Patients' Medical Records	47.4	65.9	0.012
Offering Extended Evening Hours	33.7	42.0	0.244
Offering Weekend Hours	37.9	34.1	0.592
Offering Same-Day Appointments	97.9	92.0	0.068
Using Call Center Triage	56.8	75.0	0.010
Access to home health & palliative care			
Integrating palliative care into routine cancer care	68.4	77.3	0.179
Providing access and/or referral to home hospice services	97.9	100.0	0.171
Coordinating care with home health agencies	92.6	97.7	0.111
Core Functions of Patient Navigation			
Coordinating Appointments with Clinicians Inside and Outside Practice	83.2	87.5	0.408
Maintaining Communication with Patients and Their Families	77.9	76.1	0.777
Ensuring that Appropriate Medical Records are Available at Appointments	88.4	88.6	0.964
Arranging Language Translation or Interpretation Services	88.4	90.9	0.581
Facilitating Connections to Follow-Up Services	77.9	79.5	0.785
Providing Access to Clinical Trials	70.5	73.9	0.615
Building Partnerships with Local Agencies and Groups	58.9	72.7	0.050
Facilitating Financial Support	83.2	76.1	0.237
Arranging Transportation	47.4	62.5	0.040
Arranging Child or Elder Care	20.0	29.5	0.134
Helping with Paperwork	70.5	71.6	0.874
Using Data for CQI			
Review of Data with Practice on a Quarterly Basis: Quality of Care	86.3	85.2	0.833
Review of Data with Practice on a Quarterly Basis: Utilization	80.0	80.7	0.908
Review of Data with Practice on a Quarterly Basis: Patient Experience	72.6	85.2	0.038
Employing a Formal Model of Quality Improvement in Your Practice	43.2	83.0	0.000
Sharing Team/Provider-Identified Data within the Practice	74.7	80.7	0.335

Measure	Independent, Percent of OCM Practices n=95	Owned by Hospital or Health System, Percent of OCM Practices n=88	P-Value from Chi-Squared Test
Strategies to Support Adherence to National Guidelines/Standardize Treatment Approaches			
Holding Multidisciplinary Treatment Planning Conferences or Workshops	88.4	96.6	0.038
Integrating Clinical Decision Support in Documentation Workflow	81.1	75.0	0.322
CDS is Integrated with the EHR	70.5	62.5	0.250
CDS is Integrated with the Chemotherapy Electronic Order Management System	55.8	55.7	0.988

Source: OCM Practice 2017 responses to the Practice Transformation Plans.

Exhibit 41: Percent of Practices Reporting Using Practice Transformation Approaches, Stratified by Academic Affiliation, Results from 2017 Practice Transformation Plans

Measure	No Academic Affiliation, Percent of OCM Practices n=153	Has Academic Affiliation, Percent of OCM Practices n=30	P-Value from Chi-Squared Test
Used OCM Revenue to Hire Additional Staff	89.5	90.0	0.940
Care Coordination			
Performing Medication Reconciliation with Outside Clinicians	60.1	63.3	0.743
Performing Medication Reconciliation with Patients during Care Transitions	93.5	93.3	0.979
Conducting Individualized Education with Patients for All Medications	85.0	93.3	0.222
Tracking Patients Referred to Other Specialists through Entire Process	64.7	50.0	0.129
Participating in Health Information Exchange with Other Practices	69.9	83.3	0.134
Scheduled meetings for management of complex patients on a weekly basis	59.5	90.0	0.001
Use of Risk Stratification			
Assigning a Risk Status to Each Patient	30.7	26.7	0.658
Assigning Patients to a Risk Cohort	27.5	26.7	0.930
Stratifying Patients into Actionable Risk Cohorts	47.1	36.7	0.296
Referral Coordination and Management			
Preparing Patients for Referral or Other Specialty Consultation	90.2	83.3	0.271
Using systematic criteria for referral	64.7	60.0	0.624
Using structured referral notes	64.1	63.3	0.940
Following a structured process for routine and timely follow-up on hospitalizations, ED visits, and stays in other institutional settings	65.4	60.0	0.575
Using structured communications (such as forms or standard reports) to communicate across care settings to enable information flow and seamless transitions	71.2	83.3	0.171
Sharing data with clinical stakeholders outside the practice to engage them in efforts to improve care and patient experience and reduce cost	39.2	50.0	0.272
Maintaining written agreements with care partners (e.g., care coordination agreements, care compacts, or referral agreements)	28.1	40.0	0.194
Patient Provider Communication			
Providing Patient Portal with Access to Medical Information and Documents	93.5	100.0	0.150
Providing Secure Email of Medical Information and Documents	76.5	90.0	0.098
Use Remote Monitoring Technology Data to Promote Change in Patient Health	11.1	10.0	0.858
Employing Telephone Visits	30.1	33.3	0.722
Offering Two-Way Video Visits	9.8	16.7	0.271

Measure	No Academic Affiliation, Percent of OCM Practices n=153	Has Academic Affiliation, Percent of OCM Practices n=30	P-Value from Chi-Squared Test
Using Patient Decision Aids, Such as Option Grids or Video Decision Aids	26.8	20.0	0.436
Discussing Treatment Options, including Palliative Care, Early	86.9	83.3	0.600
Enhanced Oncology Services			
Providing Clinicians Outside the Practice Access to Patients' Medical Records	53.6	70.0	0.098
Offering Extended Evening Hours	34.6	53.3	0.053
Offering Weekend Hours	34.0	46.7	0.186
Offering Same-Day Appointments	95.4	93.3	0.628
Using Call Center Triage	64.1	73.3	0.328
Access to home health & palliative care			
Integrating palliative care into routine cancer care	68.6	93.3	0.005
Providing access and/or referral to home hospice services	98.7	100.0	0.529
Coordinating care with home health agencies	94.1	100.0	0.173
Core Functions of Patient Navigation			
Coordinating Appointments with Clinicians Inside and Outside Practice	87.6	73.3	0.044
Maintaining Communication with Patients and Their Families	79.7	63.3	0.051
Ensuring that Appropriate Medical Records are Available at Appointments	90.8	76.7	0.026
Arranging Language Translation or Interpretation Services	88.2	96.7	0.166
Facilitating Connections to Follow-Up Services	81.0	66.7	0.079
Providing Access to Clinical Trials	71.2	76.7	0.545
Building Partnerships with Local Agencies and Groups	66.0	63.3	0.778
Facilitating Financial Support	83.7	60.0	0.003
Arranging Transportation	54.2	56.7	0.808
Arranging Child or Elder Care	23.5	30.0	0.452
Helping with Paperwork	73.9	56.7	0.058
Using Data for CQI			
Review of Data with Practice on a Quarterly Basis: Quality of Care	85.0	90.0	0.470
Review of Data with Practice on a Quarterly Basis: Utilization	79.1	86.7	0.339
Review of Data with Practice on a Quarterly Basis: Patient Experience	75.2	96.7	0.009
Employing a Formal Model of Quality Improvement in your Practice	57.5	86.7	0.003
Sharing Team/Provider-Identified Data within the Practice	79.1	70.0	0.275
Strategies to Support Adherence to National Guidelines/Standardize Treatment Approaches			
Holding Multidisciplinary Treatment Planning Conferences or Workshops	90.8	100.0	0.085
Integrating Clinical Decision Support in Documentation Workflow	81.7	60.0	0.009

Measure	No Academic Affiliation, Percent of OCM Practices n=153	Has Academic Affiliation, Percent of OCM Practices n=30	P-Value from Chi-Squared Test
CDS is Integrated with the EHR	70.6	46.7	0.011
CDS is Integrated with the Chemotherapy Electronic Order Management System	60.1	33.3	0.007

Source: OCM Practice 2017 responses to the Practice Transformation Plans.

Exhibit 42: Change between 2016 and 2017 in Percent of Practices Reporting Using Practice Transformation Approaches, Results from 2016 and 2017 Practice Transformation Plans

Measure	Year One, Percent of OCM Practices	Year Two, Percent of OCM Practices	Difference	P-Value from Chi-Squared Test
	N=178	N=178		
Used OCM Revenue To Hire Additional Staff	93.8	90.4	-3.4	0.237
Care Coordination				
Performing Medication Reconciliation with Outside Clinicians	57.3	60.7	3.4	0.518
Performing Medication Reconciliation with Patients during Care Transitions	93.3	93.3	0.0	1.000
Tracking Patients Referred to Other Specialists through Entire Process	69.1	62.9	-6.2	0.218
Participating in Health Information Exchange with Other Practices	71.3	72.5	1.2	0.814
Scheduled meetings for management of complex patients on a weekly basis	74.2	65.2	-9.0	0.065
Use of Risk Stratification				
Assigning a Risk Status to Each Patient	37.6	30.3	-7.3	0.146
Stratifying Patients into Actionable Risk Cohorts	29.8	46.1	16.3	0.002
Referral Coordination and Management				
Preparing Patients for Referral or other Specialty Consultation	92.1	89.3	-2.8	0.361
Using systematic criteria for referral	59.6	64.0	4.4	0.383
Using structured referral notes	65.2	64.6	-0.6	0.912
Following a structured process for routine and timely follow-up on hospitalizations, ED visits, and stays in other institutional settings	66.3	65.2	-1.1	0.823
Using structured communications (such as forms or standard reports) to communicate across care settings to enable information flow and seamless transitions	78.7	73.0	-5.7	0.216
Sharing data with clinical stakeholders outside the practice to engage them in efforts to improve care and patient experience and reduce cost	44.4	41.0	-3.4	0.520
Maintaining written agreements with care partners (e.g., care coordination agreements, care compacts, or referral agreements)	22.5	29.8	7.3	0.117
Patient Provider Communication				
Providing Patient Portal with Access to Medical Information and Documents	97.2	94.4	-2.8	0.187
Providing Secure Email of Medical Information and Documents	83.1	78.1	-5.0	0.228
Use Remote Monitoring Technology Data to Promote Change in Patient Health	15.2	11.2	-4.0	0.273
Employing Telephone Visits	36.0	31.5	-4.5	0.370

Measure	Year One, Percent of OCM Practices	Year Two, Percent of OCM Practices	Difference	P-Value from Chi-Squared Test
Offering Two-Way Video Visits	8.4	11.2	2.8	0.373
Using Patient Decision Aids, Such as Option Grids or Video Decision Aids	34.8	25.3	-9.5	0.049
Discussing Treatment Options, Including Palliative Care, Early	88.8	86.5	-2.3	0.519
Enhanced Oncology Services				
Providing Clinicians Outside the Practice Access to Patients' Medical Records	49.4	55.6	6.2	0.243
Offering Extended Evening Hours	35.4	38.2	2.8	0.583
Offering Weekend Hours	39.3	37.1	-2.2	0.663
Offering Same-Day Appointments	97.2	94.9	-2.3	0.275
Using Call Center Triage	68.5	65.7	-2.8	0.573
Core Functions of Patient Navigation				
Coordinating Appointments with Clinicians Inside and Outside Practice	74.7	85.4	10.7	0.012
Maintaining Communication with Patients and Their Families	75.3	76.4	1.1	0.804
Ensuring that Appropriate Medical Records are Available at Appointments	89.3	88.2	-1.1	0.737
Arranging Language Translation or Interpretation Services	87.6	89.3	1.7	0.618
Facilitating Connections to Follow-Up Services	77.5	78.1	0.6	0.899
Providing Access to Clinical Trials	72.5	71.9	-0.6	0.906
Building Partnerships with Local Agencies and Groups	65.2	65.7	0.5	0.911
Facilitating Financial Support	77.0	79.8	2.8	0.520
Using Data for CQI				
Review of Data with Practice on a Quarterly Basis: Quality of Care	78.7	85.4	6.7	0.098
Review of Data with Practice on a Quarterly Basis: Utilization	74.7	80.3	5.6	0.204
Review of Data with Practice on a Quarterly Basis: Patient Experience	74.2	78.1	3.9	0.384
Employing a Formal Model of Quality Improvement in Your Practice	59.0	62.4	3.4	0.515
Sharing Team/Provider-Identified Data within the Practice	78.7	77.0	-1.7	0.702
Strategies to Support Adherence to National Guidelines/Standardize Treatment Approaches				
Holding Multidisciplinary Treatment Planning Conferences or Workshops	92.1	92.1	0.0	1.000
CDS is Integrated with the EHR	38.2	66.3	28.1	<0.001
CDS is Integrated with the Chemotherapy Electronic Order Management System	38.2	55.6	17.4	0.001

Source: OCM Practice 2016 and 2017 responses to the Practice Transformation Plans.

F. Program Effectiveness Findings: Quality

F.1 Care Coordination and Communication

Exhibit 43: Adjusted Measures on Patient-Provider Communication, OCM Patient Survey Baseline Wave (Apr.–Sep. 16)

Measure	# of Respondents		Adjusted Mean		Difference in Adjusted Mean		
						90% CLs	
	OCM	COMP	OCM	COMP	Diff.	LCL	UCL
Affective Communication							
Composite score: affective communication (on a scale of 0–10)	10,970	8,449	9.03	9.07	-0.04	-0.08	0.01
Cancer therapy team always showed respect for what patient had to say	10,898	8,397	81.1%	81.7%	-0.7%	-1.7%	0.4%
Cancer therapy team always listened carefully to the patient	10,913	8,420	79.8%	80.5%	-0.7%	-1.8%	0.5%
Cancer therapy team was always direct and straightforward when talking with patient about cancer and drug therapy	10,848	8,356	77.6%	78.1%	-0.4%	-1.6%	0.7%
Cancer therapy team always spent enough time with the patient	10,893	8,377	72.9%	74.2%	-1.3%*	-2.5%	-0.1%
Exchanging Information							
Composite score: exchanging information (on a scale of 0–10)	10,956	8,431	8.52	8.51	0.01	-0.04	0.06
Cancer therapy team definitely clearly explained how drug treatment could affect the patient's normal daily activities	10,803	8,360	75.1%	73.9%	1.2%*	0.1%	2.3%
Cancer therapy team definitely told patient what the next steps in drug therapy would be	10,739	8,267	69.7%	69.8%	-0.1%	-1.2%	1.0%
Cancer therapy team always explained test results in a way that was easy to understand	10,906	8,392	75.9%	77.2%	-1.3%*	-2.5%	-0.1%
Cancer therapy team definitely explained what new medicine was for in a way that was easy to understand (if patient was prescribed new medicine in the last 6 months)	4,903	3,794	89.4%	88.9%	0.4%	-0.7%	1.6%
Shared Decision Making							
Composite score: shared decision making (on a scale of 0–10)	11,008	8,484	7.51	7.57	-0.05	-0.13	0.03
Cancer therapy team definitely talked with patient about the reasons patient might want to have drug therapy	10,933	8,425	86.1%	86.6%	-0.4%	-1.3%	0.5%
Cancer therapy team definitely talked with patient about the reasons patient might not want to have drug therapy	10,880	8,376	44.4%	45.1%	-0.7%	-2.0%	0.6%

Measure	# of Respondents		Adjusted Mean		Difference in Adjusted Mean		
					Diff.	90% CLs	
	OCM	COMP	OCM	COMP		LCL	UCL
Cancer therapy team definitely asked for patient's opinion about whether or not to have drug therapy	10,876	8,387	63.3%	64.4%	-1.2%	-2.5%	0.2%
Cancer therapy team definitely involved patient in decisions about drug therapy as much as the patient wanted	10,902	8,412	76.2%	76.9%	-0.7%	-1.9%	0.4%

Source: OCM patient survey.
Notes: OCM: OCM intervention group; COMP: Comparison group.
*p≤0.10, **p≤0.05, ***p≤0.01

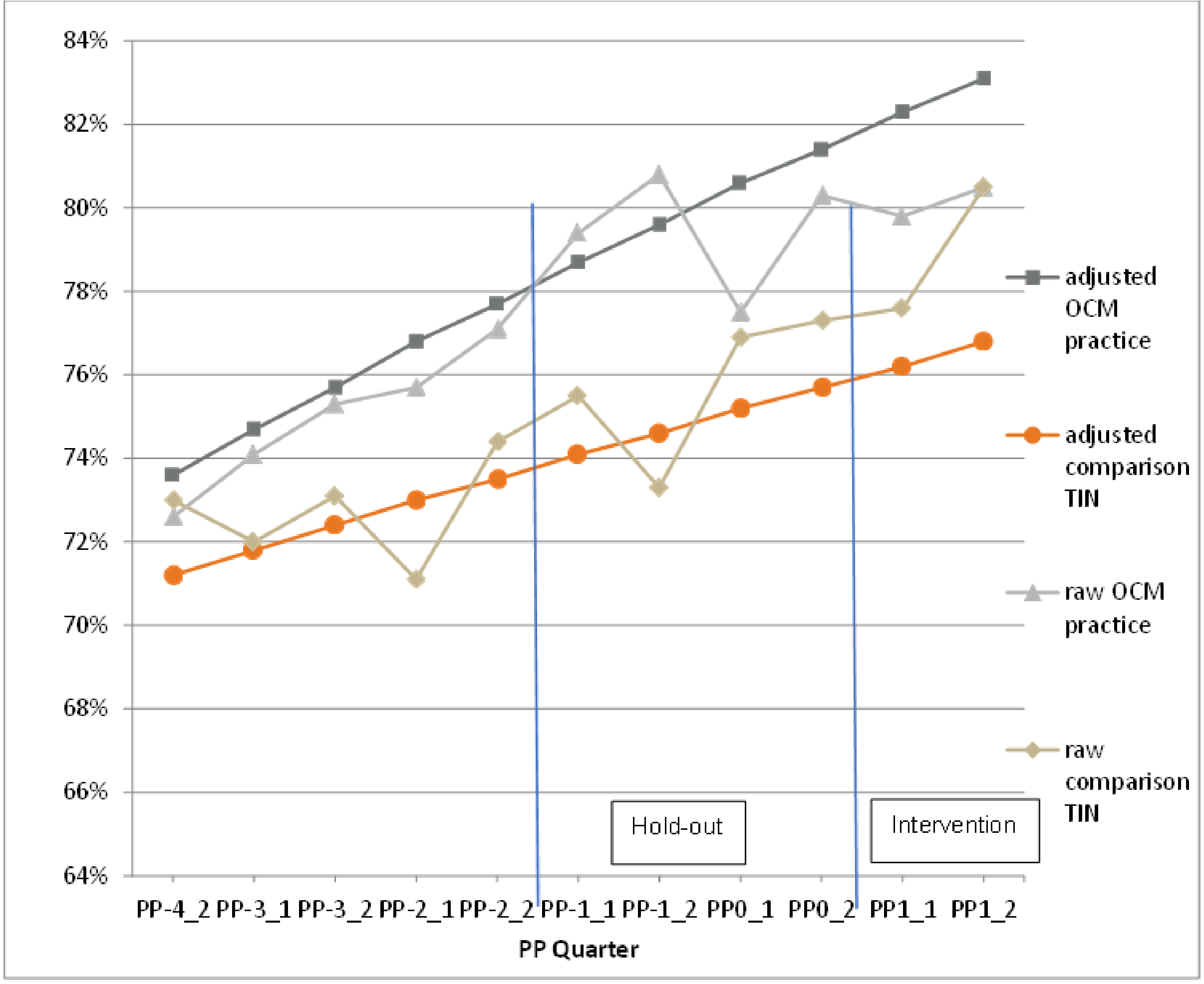
F.2 Supportive Care

F.2.1 Use of Antiemetics

As reported in the PP1 Report, we found no systematic impact of OCM on antiemetic prophylaxis for intravenous chemotherapy. Here we also show the crude trends and the trends from the adjusted DID models for the baseline period and the intervention period, as well as the hold-out period (included due to notable changes in some measures over time to better understand trends before the intervention). Quarterly results are shown separately for each of the five analytic models; guideline-recommended antiemetic use for high, moderate, and low emetogenic risk intravenous chemotherapy; and high-intensity antiemetic use among patients receiving guideline-recommended antiemetic regimens (for moderate and low emetogenic risk only).

We call particular attention to **Exhibit 44**, which shows use of guideline-recommended antiemetic use for high emetic risk chemotherapy. The baseline trend in this and other models was calculated from performance period quarters PP-4_2 through PP-2_2 (baseline period). As can be seen in **Exhibit 44**, there is an appearance of non-parallel trends for the baseline period that was confirmed in model-based adjusted analyses (p=0.043). However, pre-intervention trends pass the parallel trend test (p=0.102) when additional quarters from the hold-out period are included. We elected not to adjust for the difference in baseline trends for this analytic subgroup because the totality of evidence from the baseline and hold-out period was not suggestive of a trend difference in the pre-intervention period. We did not observe statistically significant differences in baseline (and hold-out period) trends between OCM and control practices for the other four measures (all p>0.10).

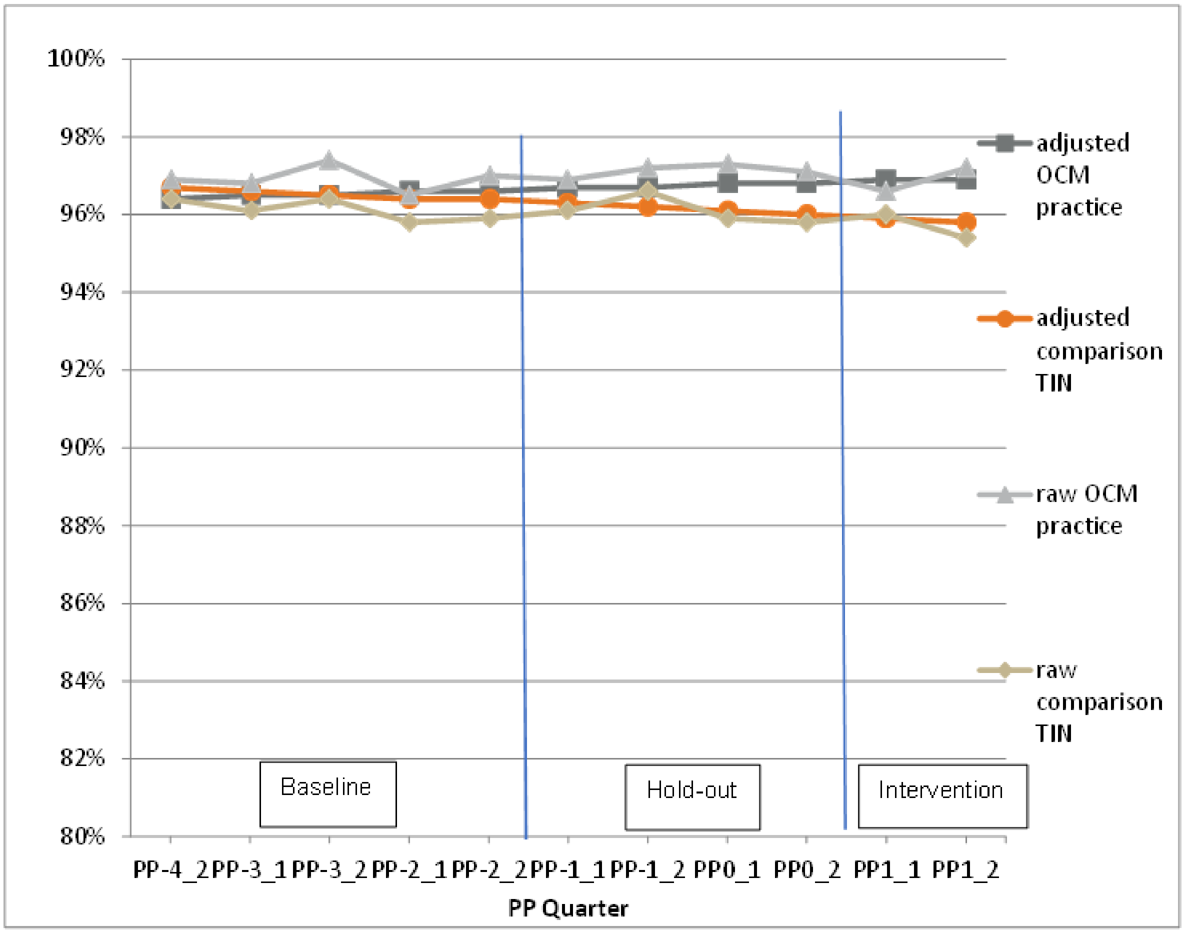
Exhibit 44: **Adjusted Rate of Guideline-Recommended Antiemetic Use for High Emetic Risk IV Chemotherapy in Baseline, Hold-Out, and Intervention Periods**



Source: Episode analytic file (2014-2017)

Note: PP-4_2 through PP-2_2 refer to the five quarters in the baseline period used for this analysis, PP-1_1 through PP0_2 refer to the four quarters in the hold-out period, and PP1_1 and PP1_2 refer to the two quarters in the intervention period.

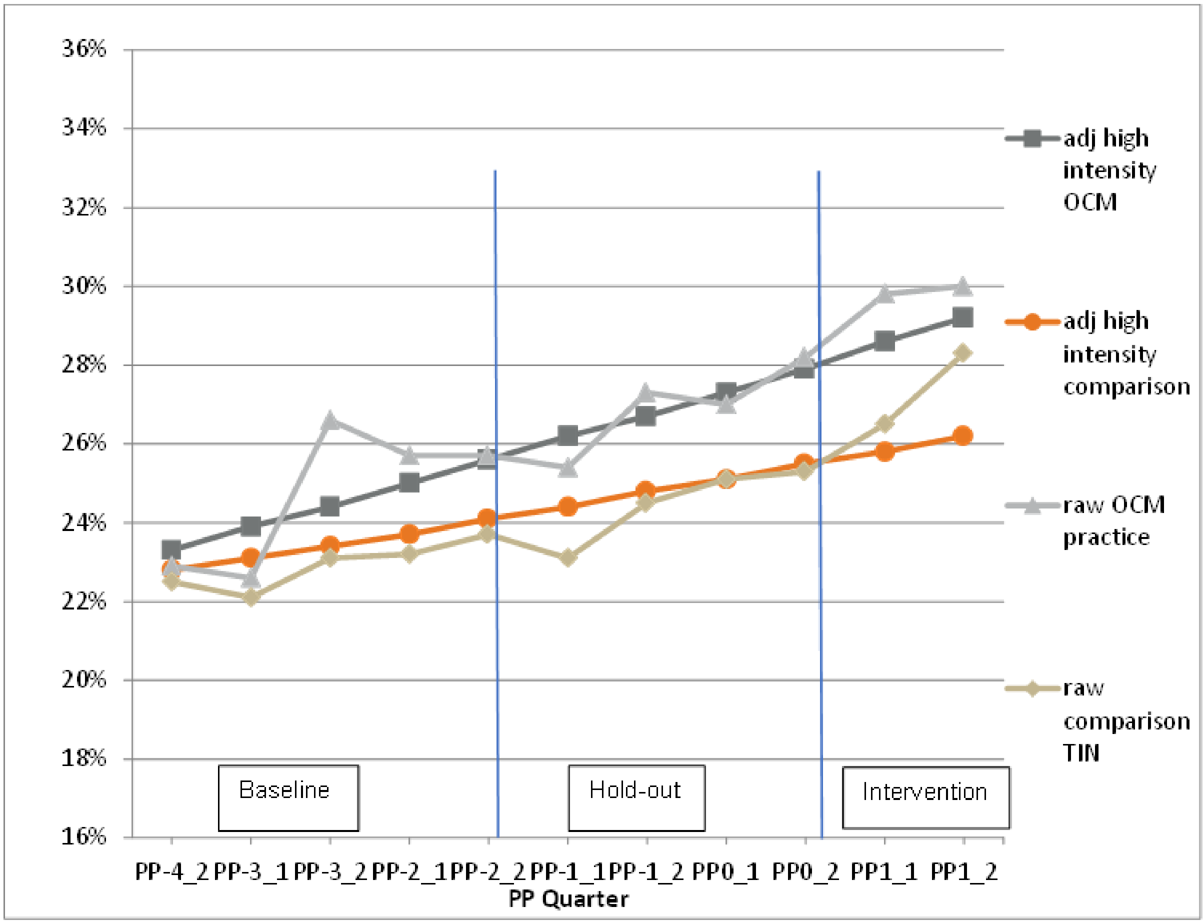
Exhibit 45: Adjusted Rate of Guideline-Recommended Antiemetic Use for Moderate Emetic Risk IV Chemotherapy in Baseline, Hold-out, and Intervention Periods



Source: Episode analytic file (2014-2017)

Note: PP-4_2 through PP-2_2 refer to the five quarters in the baseline period used for this analysis, PP-1_1 through PP0_2 refer to the four quarters in the hold-out period, and PP1_1 and PP1_2 refer to the two quarters in the intervention period.

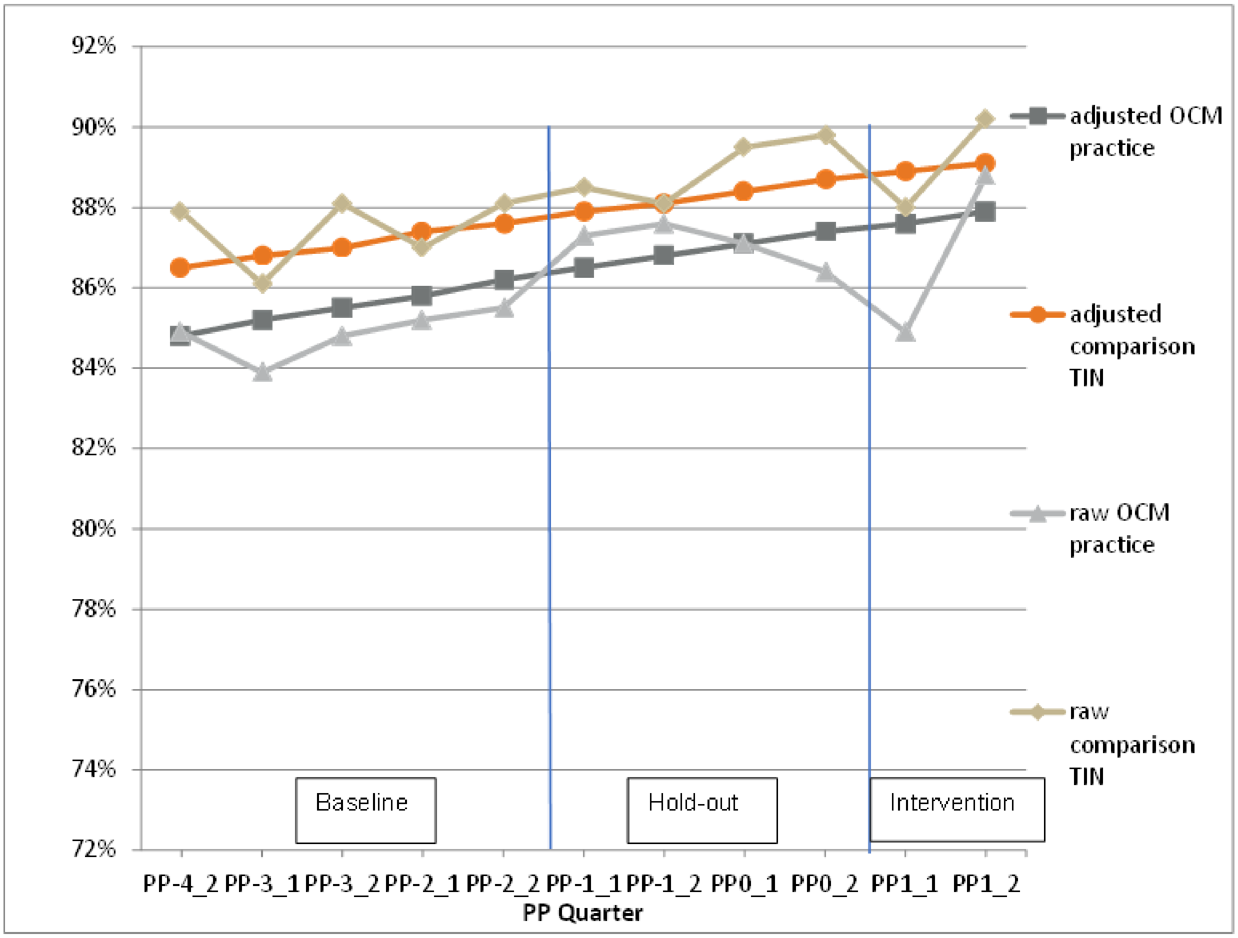
Exhibit 46: **Adjusted Rate of High Intensity Guideline-Recommended Antiemetic Use for Moderate Emetic Risk IV Chemotherapy in Baseline, Hold-out, and Intervention Periods**



Source: Episode analytic file (2014-2017)

Note: PP-4_2 through PP-2_2 refer to the five quarters in the baseline period used for this analysis, PP-1_1 through PP0_2 refer to the four quarters in the hold-out period, and PP1_1 and PP1_2 refer to the two quarters in the intervention period

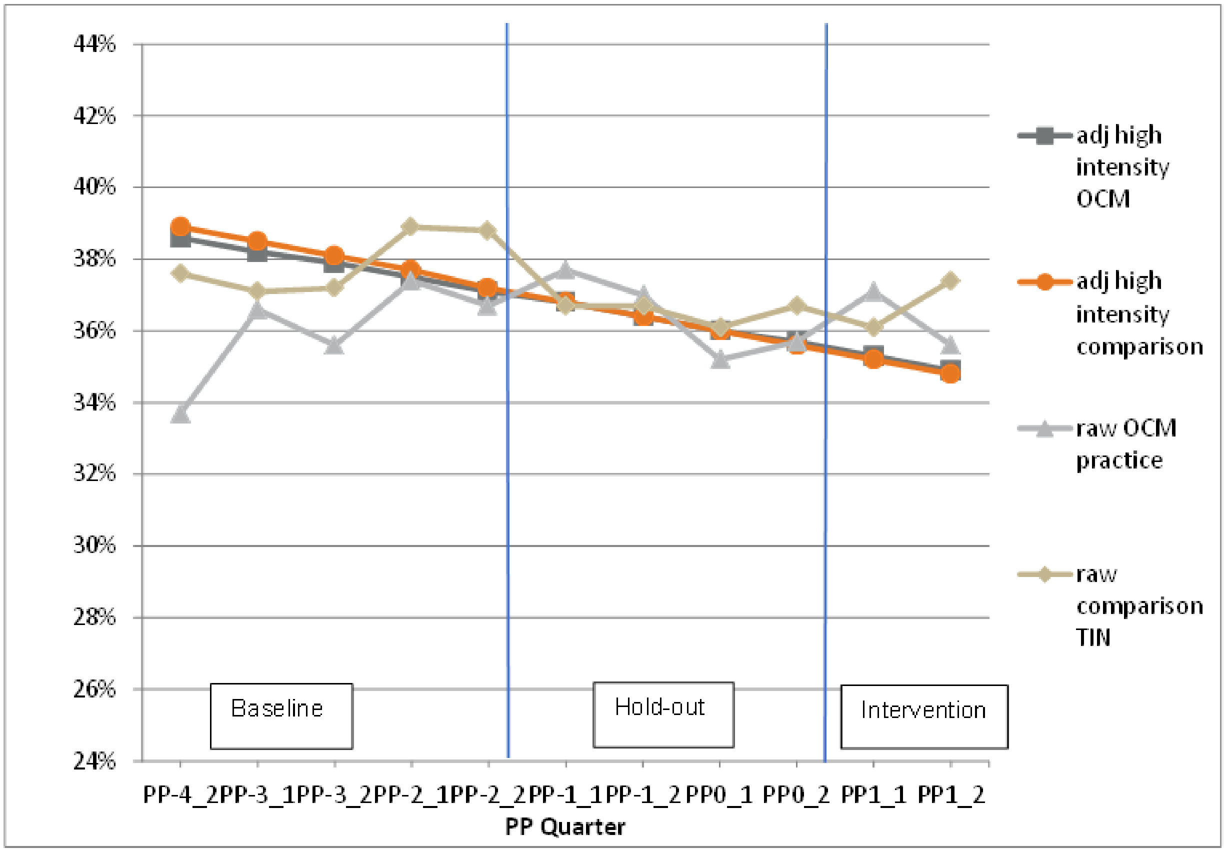
Exhibit 47: Adjusted Rate of Guideline-Recommended Antiemetic Use for Low Emetic Risk IV Chemotherapy in Baseline, Hold-out, and Intervention Periods



Source: Episode analytic file (2014-2017)

Note: PP-4_2 through PP-2_2 refer to the five quarters in the baseline period used for this analysis, PP-1_1 through PP0_2 refer to the four quarters in the hold-out period, and PP1_1 and PP1_2 refer to the two quarters in the intervention period.

Exhibit 48: Adjusted Rate of High Intensity Guideline-Recommended Antiemetic Use for Low Emetic Risk IV Chemotherapy in Baseline, Hold-out, and Intervention Periods



Source: Episode analytic file (2014-2017)

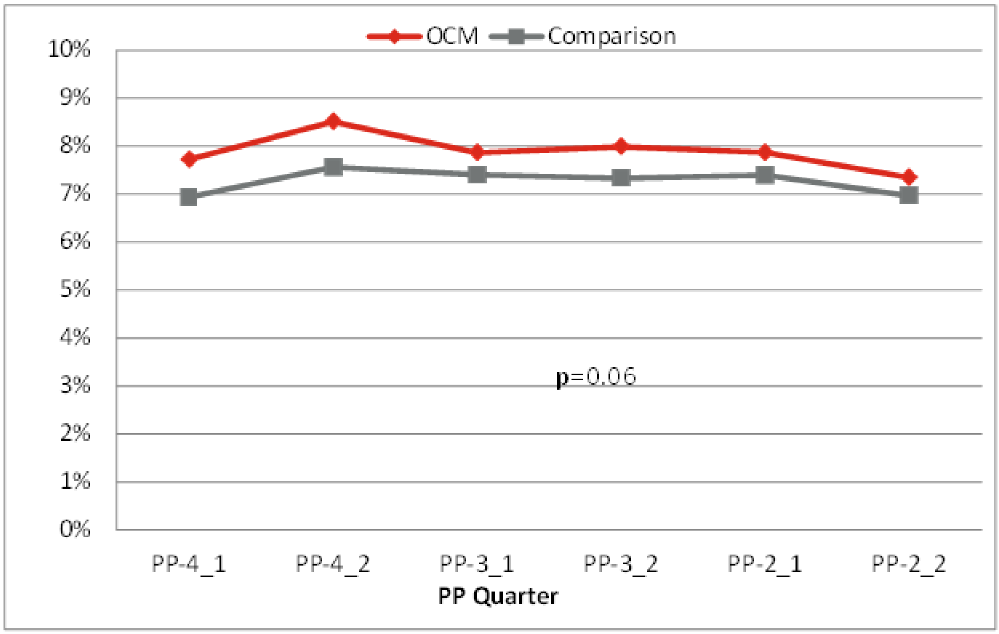
Note: PP-4_2 through PP-2_2 refer to the five quarters in the baseline period used for this analysis, PP-1_1 through PP0_2 refer to the four quarters in the hold-out period, and PP1_1 and PP1_2 refer to the two quarters in the intervention period.

F.2.2 Chemotherapy-Associated Hospitalizations and ED Visits

In this Appendix, we show results of baseline trends for the measures presented in the PP1 Report (chemotherapy-associated hospitalizations and chemotherapy-associated ED visits). In addition, we show results separately for chemotherapy-associated ED visits that lead to a hospitalization and ED visits that do not lead to a hospitalization.

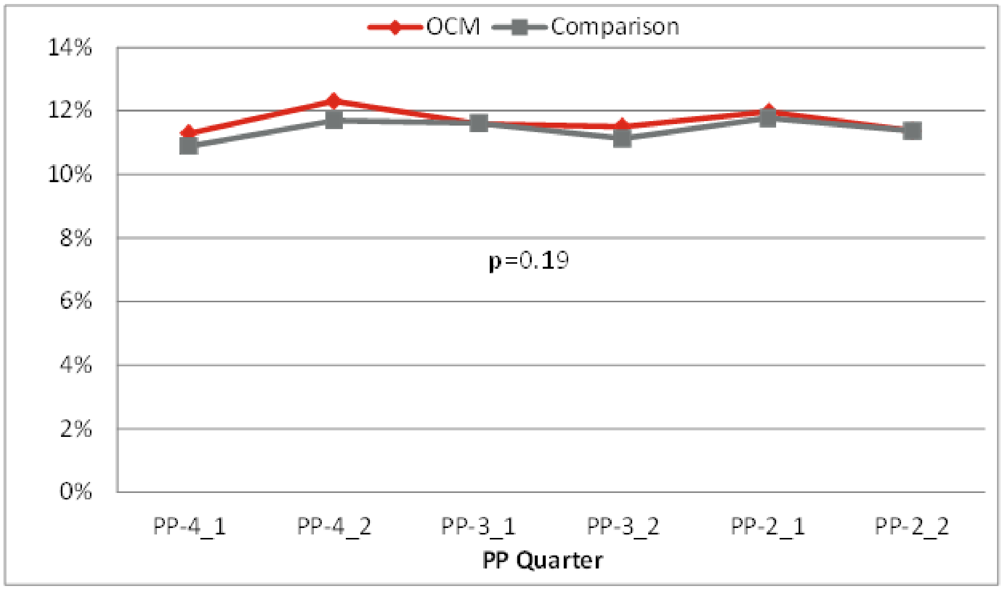
The following exhibits show the rates of each measure in the baseline period by quarter for all chemotherapy-associated hospitalizations and ED visits, as well as the p-value for the parallel trends test (neither of which was statistically significant). In addition, in **Exhibits 51 and 52**, we show the baseline rates of ED visits that did or did not lead to a hospitalization with parallel trends tests. **Exhibit 53** shows the DID estimates for these latter two ED measures. There was a significant difference in the baseline trends for the measure assessing ED visits resulting in a hospital admission (p=0.03). We therefore include DID results in the exhibit for DID models with and without an interaction term, to account for the observed difference in the baseline trends, so the reader can see that there is no statistically significant effect with either approach.

Exhibit 49: **Unadjusted Rate of Chemotherapy-Associated Hospitalizations by Quarter in Baseline Period**



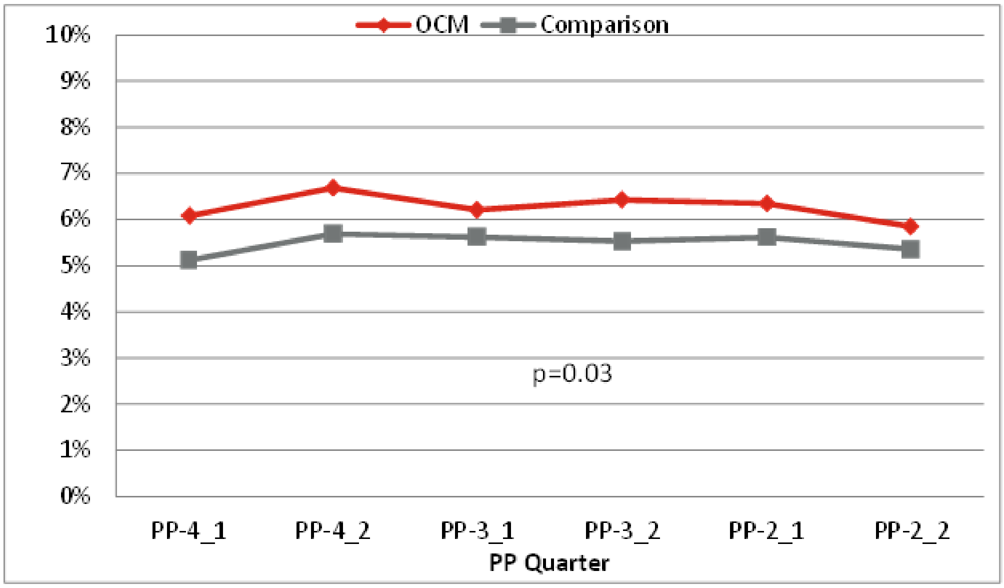
Source: Episode analytic file (2014–2017).
Note: PP-4_1 through PP-2_2 refer to the six quarters in the baseline period.

Exhibit 50: Unadjusted Rate of All Chemotherapy-Associated ED Visits by Quarter in Baseline Period



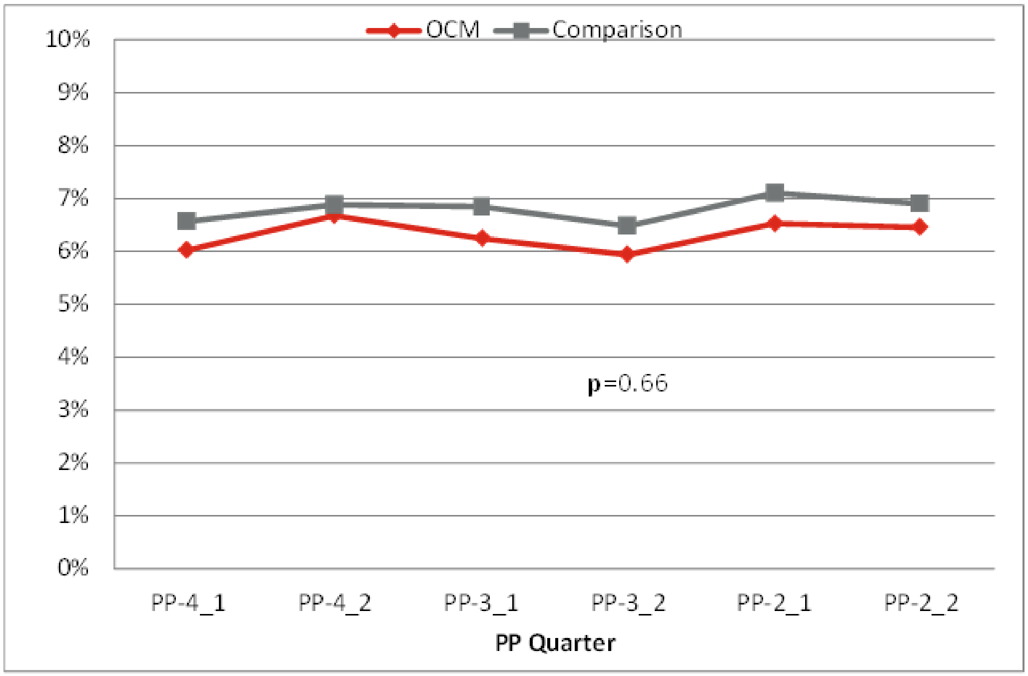
Source: Episode analytic file (2014-2017)
Note: PP-4_1 through PP-2_2 refer to the six quarters in the baseline period.

Exhibit 51: Unadjusted Rate of Chemotherapy-Associated ED Visits Resulting in a Hospital Admission by Quarter in Baseline Period



Source: Episode analytic file (2014-2017)
Note: PP-4_1 through PP-2_2 refer to the six quarters in the baseline period.

Exhibit 52: **Unadjusted Rate of Chemotherapy-Associated ED Visits without a Hospital Admission by Quarter in Baseline Period**



Source: Episode analytic file (2014-2017)
Note: PP-4_1 through PP-2_2 refer to the six quarters in the baseline period.

Exhibit 53: Chemotherapy-Associated ED Visits with and without Hospitalizations (PP1)

Measure	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90 % LCL	90 % UCL	Percent Change
Episodes with Chemotherapy-Associated ED Visit Leading to Admission	489,710	579,678	6.08%	5.69%	5.58%	5.37%	-0.16%	-0.37%	0.47%	-2.69%
Episodes with Chemotherapy-Associated ED Visit Leading to Admission (Trend and OCM Trend Interaction)	489,710	579,678	6.51%	5.37%	5.79%	4.50%	0.30%	-0.12%	0.71%	4.53%
Episodes with Chemotherapy-Associated ED Visit without Admission	489,710	579,678	6.40%	6.15%	6.65%	6.39%	0.00%	-0.20%	0.19%	-0.04%

Source: Episode analytic file (2014–2017).

Notes: OCM: OCM intervention group; COMP: Comparison group

*p≤0.10, **p≤0.05, ***p≤0.01.

F.2.3 Patient Reported Symptom Management

Exhibit 54: Adjusted Measures on Symptom Control, Baseline OCM Patient Survey (Apr.–Sep. 16)

Measure	# of Respondents		Adjusted Mean		Difference in Adjusted Mean		
						90% CLs	
	OCM	COMP	OCM	COMP	Diff.	LCL	UCL
Composite Score							
Composite score: enabling patient self-management (on a scale of 0–10)	10,872	8,367	6.05	6.01	0.03	-0.04	0.11
Composite score: symptom management (on a scale of 0–10)	5,700	4,426	7.38	7.37	0.01	-0.09	0.10
Individual Question: Talked about Symptoms							
Cancer therapy team talked with patient about pain related to cancer or chemotherapy or hormonal therapy	10,777	8,299	72.3%	72.4%	-0.1%	-1.3%	1.2%
Cancer therapy team talked with patient about changes in energy levels related to cancer or chemotherapy or hormonal therapy	10,811	8,314	78.5%	78.7%	-0.2%	-1.3%	1.0%
Cancer therapy team talked with patient about emotional problems related to cancer or chemotherapy or hormonal therapy	10,849	8,314	55.5%	52.5%	3.0%***	1.3%	4.7%
Individual Question: Helped Deal with Symptoms							
Cancer therapy team definitely tried to help patient deal with pain (if patient had this symptom from cancer or drug therapy in the last 6 months)	5,900	4,555	75.5%	76.7%	-1.1%	-2.7%	0.5%
Cancer therapy team definitely tried to help patient deal with changes in energy levels (if patient had this symptom from cancer or drug therapy in the last 6 months)	8,213	6,285	52.4%	52.6%	-0.2%	-1.8%	1.3%
Cancer therapy team definitely tried to help patient deal with emotional problems (if patient had this symptom from cancer or drug therapy in the last 6 months)	5,235	4,155	46.6%	45.7%	0.9%	-1.1%	2.8%
Cancer therapy team definitely tried to help patient deal with nausea/vomiting (if patient had this symptom from cancer or drug therapy in the last 6 months)	3,622	2,879	80.6%	79.3%	1.3%	-0.2%	2.9%

Measure	# of Respondents		Adjusted Mean		Difference in Adjusted Mean		
						90% CLs	
	OCM	COMP	OCM	COMP	Diff.	LCL	UCL
Cancer therapy team definitely tried to help patient deal with difficulty breathing (if patient had this symptom from cancer or drug therapy in the last 6 months)	2,997	2,293	58.7%	58.5%	0.2%	-2.1%	2.5%
Cancer therapy team definitely tried to help patient deal with coughing (if patient had this symptom from cancer or drug therapy in the last 6 months)	2,714	2,077	52.3%	54.4%	-2.1%	-4.6%	0.5%
Cancer therapy team definitely tried to help patient deal with constipation/diarrhea (if patient had this symptom from cancer or drug therapy in the last 6 months)	6,486	5,010	67.8%	67.6%	0.2%	-1.5%	1.9%
Cancer therapy team definitely tried to help patient deal with neuropathy (if patient had this symptom from cancer or drug therapy in the last 6 months)	4,889	3,804	49.3%	49.5%	-0.2%	-2.0%	1.6%
Individual Question: Talked about Other Services							
Cancer therapy team definitely talked with patient about additional services to manage care at home	10,836	8,330	22.6%	23.1%	-0.5%	-1.5%	0.5%
Cancer therapy team definitely talked with patient about things patient can do to maintain health during cancer treatment	10,205	7,847	49.2%	49.0%	0.2%	-1.3%	1.7%

Source: OCM patient survey.
Notes: OCM: OCM intervention group; COMP: Comparison group.
*p≤0.10, **p≤0.05, ***p≤0.01

F.3 EOL Care

F.3.1 Patient-Reported EOL Care Experience

Exhibit 55: Adjusted Measures on Proxy-reported EOL Care Experience, by OCM Survey Wave (OCM Proxy Respondents Only, No Comparisons)

Measure	Adjusted Mean				Linear Time Trend Estimates		
	Baseline Wave (Apr. 16–Sep. 16)	Int. Wave 1 (Jul. 16–Dec. 16)	Int. Wave 2 (Oct. 16–Mar. 17)	Int. Wave 3 (Jan. 17–Jun. 17)	Point Estimate	90% CLs LCL	90% CLs UCL
The patient's overall experience in the last month of life was excellent/very good/good	90.5%	91.2%	89.5%	89.6%	-0.4%	-1.4%	0.6%
Care providers always showed respect for what the patient had to say	74.7%	73.5%	75.0%	76.0%	0.5%	-1.0%	2.1%
Care providers always listened carefully to the patients	70.0%	68.2%	69.5%	71.8%	0.6%	-1.1%	2.4%
Care providers were always direct and straightforward when talking with the patient	61.8%	59.3%	64.3%	65.9%	1.7%	-0.01%	3.4%
Care providers always explained things in a way the patient could understand	62.9%	62.1%	64.3%	64.3%	0.6%	-1.2%	2.4%
Care providers always spent enough time with the patient	55.8%	50.8%	53.3%	55.3%	0.05%	-1.8%	1.9%
The patient never got conflicting information about care from different care providers	77.3%	78.0%	75.5%	76.2%	-0.6%	-2.1%	0.9%
Care providers followed the patient's wishes to a great deal	82.8%	83.5%	80.8%	82.2%	-0.4%	-1.9%	1.1%

Source: OCM patient survey.
Notes: Int: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01

Exhibit 56: Adjusted Measures on Proxy-reported Hospice Use, OCM Patient Survey Baseline Wave (Apr.–Sep. 2016)

Measure	Number of Respondents		Adjusted Mean		Difference in Adjusted Mean		
					Diff.	90% CLs	
	OCM	COMP	OCM	COMP		LCL	UCL
Cancer therapy team discussed hospice care with the patient or family	2,098	1,658	83.8%	83.2%	0.6%	-1.7%	2.9%
The patient received hospice care	1,767	1,399	86.5%	85.7%	0.8%	-1.5%	3.1%
The patient started hospice care at the right time	1,428	1,142	80.1%	83.6%	3.6%**	-6.1%	-1.0%

Source: OCM patient survey.
Notes: OCM: OCM intervention group; COMP: Comparison group.
*p≤0.10, **p≤0.05, ***p≤0.01

F.3.2 Validating Proxy-Reported EOL Care Experience Responses Using Medicare Claims

For the OCM evaluation, we used several claims-based measures of hospital-based EOL care, chemotherapy, and hospice-use to understand whether OCM reduces unnecessary treatments that may impair the quality of an individual's last days. While these measures and others like them are endorsed by the National Quality Forum (NQF) and used extensively in research about EOL care, there has been little research about whether these claims-based measures reflect good quality care in the eyes of dying patients or their family members. Existing prior studies have found that the avoidance of medical interventions at the EOL, timely hospice initiation, and dying outside of the hospital are associated with better quality of care and higher satisfaction as reported by family and caregivers.[25] However, the prior literature was limited to smaller study populations and fewer types of cancer, and the results may not reflect patient/family-perceived quality of EOL care for all Medicare cancer patients. For the OCM evaluation, we use both claims-based measures and survey measures to understand quality of EOL care, and include a

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[25] Ersek, M., Miller, S. C., Wagner, T. H., Thorpe, J. M., Smith, D., Levy, C. R., et al. (2017). Association between aggressive care and bereaved families' evaluation of end-of-life care for veterans with non-small cell lung cancer who died in Veterans Affairs facilities. *Cancer* 123(16):3186–3194.

Kris, A. E., Cherlin, E. J., Prigerson, H., Carlson, M. D., Johnson-Hurzeler, R. (M.P.H., R.N.), Kasl, S. V., and Bradley, E. H. (2006). Length of hospice enrollment and subsequent depression in family caregivers: 13-month follow-up study. *American Journal of Geriatric Psychiatry* 14(3):264–269.

Wright, A. A., Keating, N. L., Ayanian, J. Z., Chrischilles, E. A., Kahn, K. L., Ritchie, C. S., et al. (2016). Family perspectives on aggressive cancer care near the end of life. *The Journal of American Medical Association* 315(3):284–292.

Wright, A. A., Keating, N. L., Balboni, T. A., Matulonis, U. A., Block, S. D., and Prigerson, H. G. (2010). Place of death: Correlations with quality of life of patients with cancer and predictors of bereaved caregivers' mental health. *Journal of Clinical Oncology* 28(29):4457–4464.

Wright, A. A., Zhang, B., Keating, N. L., Weeks, J. C., and Prigerson, H. G. (2014). Associations between palliative chemotherapy and adult cancer patients' end of life care and place of death: Prospective cohort study. *BMJ* 348:g1219–g1219.

Wright, A. A., Zhang, B., Ray, A., Mack, J. W., Trice, E., Balboni, T. A., et al. (2008). Associations between end-of-life discussions, patient mental health, medical care near death, and caregiver bereavement adjustment. *The Journal of American Medical Association* 300(14):1665–1673.

broad population of Medicare patients with all types of cancer. For a subset of deceased patients, we have both claims data and survey responses from their bereaved family members, and can directly compare whether less use of hospital-based care and chemotherapy and increased hospice use at the EOL is perceived by family members as better quality care. Our goal is to validate the claims-based measures selected for the OCM evaluation, as reflecting important aspects of family-perceived EOL quality.

Overall Patient Satisfaction and Hospital-Based Care and Chemotherapy at the EOL

Exhibit 57 shows proxies' survey rating of overall care in the deceased patient's last month of life, with respect to the receipt of hospital-based care and chemotherapy, hospice, and place of death. Rows in the table show the respective claims-based measures. Columns show the raw and adjusted number reporting excellent/below excellent care, and the p-values signifying significant differences for each row with respect to the blank reference category.

There was no relationship between chemotherapy in the last 14 days of life and the survey rating of overall EOL care; however, respondents were less likely to report excellent EOL care if the patient had IP admissions in the last 30 days of life, spent time in the ICU during the last 30 days of life, or had ED visits in the last 30 days of life. Survey respondents were more likely to report excellent overall EOL care if the patient entered hospice 14 or more days before death, and if the patient died in their own or a relative's home rather than in an institutional setting.

Exhibit 57: Associations between Hospital-Based, Chemotherapy, and Hospice Claims Measures at the EOL and Survey-Response Overall Rating on the Quality of EOL Care ("Excellent" vs. "Very Good"/"Good"/"Fair"/"Poor"; n=1,970)

EOL Care Measure	Overall Rating		Percent Choosing Excellent		P-Value
	# Below Excellent	# Excellent	Unadjusted	Adjusted	
Chemotherapy Last 14 Days					
None	892	764	46.1%	46.0%	*ref.*
Yes	182	132	42.0%	42.7%	0.281
IP Admissions Last 30 Days					
None	403	453	52.9%	52.7%	*ref.*
1 Visit	534	379	41.5%	41.6%	<0.001***
2+ Visits	137	64	31.8%	32.3%	<0.001***
ICU Use Last 30 Days					
None	776	711	47.8%	47.6%	*ref.*
Yes	298	185	38.3%	39.0%	0.001***
ED Visits Last 30 Days					
None	380	427	52.9%	52.8%	*ref.*
1 Visit	495	341	40.8%	40.4%	<0.001***
2+ Visits	199	128	39.1%	40.5%	<0.001***
Hospice Care Utilization					
Never Used Hospice	390	236	37.7%	38.1%	0.409
Hospice 1–2 Days before Death	98	69	41.3%	41.7%	*ref.*

EOL Care Measure	Overall Rating		Percent Choosing Excellent		P-Value
	# Below Excellent	# Excellent	Unadjusted	Adjusted	
Chemotherapy Last 14 Days					
Hospice 3–6 Days before Death	182	154	45.8%	46.6%	0.294
Hospice 7–13 Days before Death	160	142	47.0%	46.3%	0.331
Hospice 14+ Days before Death	232	288	55.4%	54.6%	0.004***
Hospice Use Ended before Death	12	7	36.8%	37.9%	0.746
Place of Death					
Own Home or Relative's Home	464	494	51.6%	51.2%	*ref.*
Hospital	340	205	37.6%	37.9%	<0.001***
Nursing Facility/IP Hospice	232	179	43.6%	43.8%	0.014**
Other/Unknown	38	18	32.1%	33.7%	0.009***

Notes: Adjusted rates were calculated using logistic regressions and account for age, gender, race/ethnicity, dual eligibility, education, cancer type, HCC score, treatment preferences (extending life vs. relieving pain and discomfort), and respondent relationship to patient. P-values signify tests of significant difference for each row with respect to the blank reference category; having the claims-based measure vs. not, having hospice care 1–2 days before death vs. the other categories, or death in a home vs. an institutional setting.

*p≤0.10, **p≤0.05, ***p≤0.01.

Patient Preference Attainment and Hospital-Based, Chemotherapy, and Hospice Care at the EOL

Exhibit 58 shows proxies’ survey ratings of whether the use of hospital-based or chemotherapy treatment is related to providers following a patient’s preferences for extending life as long as possible vs. emphasizing pain relief and comfort as much as possible. Again, there was no relationship between chemotherapy in the last 14 days of life and whether proxies reported that patient preferences were followed. Proxy respondents were less likely to report that patient preferences were followed if the patient had IP admissions or ED visits in the last 30 days of life. Respondents were more likely to report that patients’ preferences were followed if the patient entered hospice more than two days before death, and if the patient died in their own or a relative’s home rather than in an institutional setting.

Exhibit 58: Associations between Hospital-Based, Chemotherapy, and Hospice Claims Measures at the EOL and Survey-Response Extent Patients’ Care Providers Followed Wishes (“A Great Deal” vs. “Somewhat”/”Not At All”; n=1,671)

EOL Care Measure	Extent Care Providers Followed Patients’ Wishes		Percent Great Deal		P-Value
	# Below A Great Deal	# A Great Deal	Unadjusted	Adjusted	
Chemotherapy Last 14 Days					
None	243	1,184	83.0%	82.3%	*ref.*
Yes	44	200	82.0%	82.6%	0.909
IP Admissions Last 30 Days					
None	99	640	86.6%	85.8%	*ref.*
1 Visit	149	618	80.6%	80.5%	0.007***

EOL Care Measure	Extent Care Providers Followed Patients' Wishes		Percent Great Deal		P-Value
	# Below A Great Deal	# A Great Deal	Unadjusted	Adjusted	
2+ Visits	39	126	76.4%	75.8%	0.005***
ICU Use Last 30 Days					
None	202	1,072	84.1%	83.4%	*ref.*
Yes	85	312	78.6%	79.3%	0.077*
ED Visits Last 30 Days					
None	95	602	86.4%	85.6%	*ref.*
1 Visit	139	574	80.5%	80.1%	0.007***
2+ Visits	53	208	79.7%	80.1%	0.047**
Hospice Care Utilization					
Never Used Hospice	106	369	77.7%	78.9%	0.085*
Hospice 1–2 Days before Death	40	107	72.8%	71.9%	*ref.*
Hospice 3–6 Days before Death	40	248	86.1%	86.2%	0.001***
Hospice 7–13 Days before Death	42	228	84.4%	83.7%	0.006***
Hospice 14+ Days before Death	54	418	88.6%	87.0%	<0.001***
Hospice Use Ended before Death	5	14	73.7%	70.1%	0.873
Place of Death					
Own Home or Relative's Home	108	726	87.1%	86.7%	*ref.*
Hospital	100	338	77.2%	77.9%	<0.001***
Nursing Facility/IP Hospice	71	294	80.5%	78.5%	0.001***
Other/Unknown	8	26	76.5%	75.7%	0.135

Notes: Adjusted rates were calculated using logistic regressions and account for age, gender, race/ethnicity, dual eligibility, education, cancer type, HCC score, treatment preferences (extending life vs. relieving pain and discomfort), and respondent relationship to patient. P-values signify tests of significance difference for each row with respect to the blank reference category; having the measure vs. not, having hospice care 1–2 days before death vs. the other categories, or death in the home vs. an institutional setting.

*p≤0.10, **p≤0.05, ***p≤0.01.

Exhibit 59 shows proxies' survey rating of whether patients died in the location where they preferred to die, and if this varied by measures of hospital-based or chemotherapy treatment at the EOL. There was again no relationship between chemotherapy in the last 14 days of life and dying where the patient preferred. Proxy survey respondents were less likely to report that the patient died in their preferred place if there were IP admissions in the last 30 days of life, ICU use in the last 30 days of life, or ED visits in the last 30 days of life. Proxy survey respondents were more likely to report that patients died where they preferred if the patient entered hospice more than two days before death; dying where the patient preferred was even less likely if the patient never used hospice (only 53.0 percent of patients without hospice died where their proxy reported the patient preferred).

Exhibit 59: Associations between Hospital-Based, Chemotherapy, and Hospice Claims Measures at the EOL and Survey-Response Patient Died in Preferred Place of Death (Patient Died in Preferred Place of Death vs. Patient Died Elsewhere; n=1,712)

EOL Care Measure	Preferred Place of Death		Percent Died in Preferred Place of Death		P-Value
	# Not Died in Preferred Place of Death	# Died in Preferred Place of Death	Unadjusted	Adjusted	
Chemotherapy Last 14 Days					
None	388	1,071	73.4%	73.0%	*ref.*
Yes	70	183	72.3%	73.7%	0.820
IP Admissions Last 30 Days					
None	132	675	83.6%	83.6%	*ref.*
1 Visit	269	488	64.5%	64.1%	<0.001***
2+ Visits	57	91	61.5%	61.9%	<0.001***
ICU Use Last 30 Days					
None	297	1,033	77.7%	77.4%	*ref.*
Yes	161	221	57.9%	58.5%	<0.001***
ED Visits Last 30 Days					
None	138	611	81.6%	80.9%	*ref.*
1 Visit	226	472	67.6%	67.5%	<0.001***
2+ Visits	94	171	64.5%	66.6%	<0.001***
Hospice Care Utilization					
Never Used Hospice	229	267	53.8%	53.0%	0.001***
Hospice 1–2 Days before Death	46	97	67.8%	67.8%	*ref.*
Hospice 3–6 Days before Death	51	242	82.6%	82.5%	0.001***
Hospice 7–13 Days before Death	45	228	83.5%	83.1%	0.001***
Hospice 14+ Days before Death	75	415	84.7%	84.9%	<0.001***
Hospice Use Ended before Death	12	5	29.4%	31.4%	0.002***
Place of Death					
Own Home or Relative's Home	28	930	97.1%	96.9%	*ref.*
Hospital	246	161	39.6%	41.1%	<0.001***
Nursing Facility/IP Hospice	173	161	48.2%	47.5%	<0.001***
Other/Unknown	11	2	15.4%	19.0%	<0.001***

Notes: Adjusted rates were calculated using logistic regressions and account for age, gender, race/ethnicity, dual eligibility, education, cancer type, HCC score, treatment preferences (extending life vs. relieving pain and discomfort), and respondent relationship to patient. P-values signify tests of significance difference for each row with respect to the blank reference category; having the measure vs. not, having hospice care 1–2 days before death vs. the other categories, or death in the home vs. an institutional setting.

*p≤0.10, **p≤0.05, ***p≤0.01.

Timing of Hospice Initiation

Among the subset of dying patients who used hospice, **Exhibit 60** shows whether proxy respondents reported that hospice began too late, at the right time, or too early, stratified by the number of days in hospice before death, as calculated from hospice claims. Overall, just 12 respondents (1.0 percent) reported hospice started too early, 923 (78.6 percent) reported hospice started at the right time, and 239 (20.4 percent) reported hospice started too late. The average number of hospice days was 22.4 days (median 15 days) among those whose proxies felt that hospice started too early, 18.5 days (median 11 days) for those whose proxies felt that hospice started at the right time, and 9.9 days (median 5 days) for those whose proxies felt hospice started too late. Respondents were more likely to report that patients started hospice at the right time if hospice began three or more days before death, and the percent of respondents that rated “right time” was higher when hospice use began earlier and the patient had more time to benefit from hospice services.

Exhibit 60: Associations between Hospice Measures and Survey-Response Assessment of Hospice Care Initiation among Respondents Using Hospice (Patient Received Hospice Care Too Late, At Right Time, or Too Early; n=1,174)

Hospice Duration	Timing of Hospice Initiation			Percent Hospice Right Time		P-Value
	# Hospice Too Late	# Hospice At Right Time	# Hospice Too Early	Unadjusted	Adjusted	
Hospice Utilization						
Hospice 1–2 Days before Death	52	81	0	60.9%	61.3%	*ref.*
Hospice 3–6 Days before Death	82	216	2	72.0%	71.9%	0.026**
Hospice 7–13 Days before Death	51	218	2	80.4%	80.3%	<0.001***
Hospice 14+ Days before Death	54	408	8	86.8%	87.0%	<0.001***
Hospice Length of Stay (Days)						
10th Percentile	2.0	3.0	6.0			
25th Percentile	3.0	5.0	9.5			
50th Percentile	5.0	11.0	15.0			
Mean	9.9	18.5	22.4			
75th Percentile	13.0	24.0	21.5			
90th Percentile	24.0	43.0	51.0			

Notes: Adjusted rates were calculated using an ordered logistic regression and account for age, gender, race/ethnicity, dual eligibility, education, cancer type, HCC score, treatment preferences (extending life vs. relieving pain and discomfort), and respondent relationship to patient. P-values signify tests of significance difference for each row with respect to the blank reference category: having hospice care 1–2 days before death vs. the other categories.

*p≤0.10, **p≤0.05, ***p≤0.01.

Conclusion

Avoiding hospital-based care at the EOL, using hospice earlier relative to the date of death, and dying at home were all associated with better family-member ratings of overall EOL care, and more concordant with patient preferences. Proxies responding on behalf of deceased patients who used hospice rated longer hospice experiences (i.e., earlier hospice entry) as most appropriate. These findings are consistent with, and expand upon, prior research, indicating that claims-based measures of care at the EOL do reflect the quality of EOL care as perceived by bereaved family members.

G. Patient Survey Instruments

G.1 Main Patient Survey Instrument

Survey of Patients' Experiences with Cancer Care

Medicare records show that you were recently treated for cancer. This survey asks about your experiences with health care and cancer treatment during the past 6 months. Please think back over the past 6 months when filling out the survey.

If the person to whom this letter is addressed has passed away, we would be most grateful if a close family member or friend would fill out the survey on their behalf. Please answer as you think the person would have answered. It is important for us to learn about the experiences of all cancer patients.

Survey Instructions

Answer each question by marking the box to the left of your answer.

You are sometimes told to skip over some questions in this survey. When this happens you will see an arrow with a note that tells you what question to answer next, like this:

☐ Yes
☒ No →**If No, go to #1 on Page 3**

Please return this survey in the enclosed prepaid envelope to:

Abt SRBI
55 Wheeler Street
Cambridge, MA 02138

This survey is about the care related to the medicines you received to treat your cancer during the last 6 months. This medicine could be in the form of an infusion, an injection, or a pill. This medicine could be chemotherapy (including immunotherapy and other targeted therapies) or hormonal therapy. This survey is *not* about cancer surgery or about radiation treatment.

As you answer the survey, please think about the doctors and nurses and their support staff who were *most responsible for managing your care* related to your chemotherapy or hormonal therapy, during the last 6 months. Together, these persons are called your Cancer Therapy Team.

Understanding Cancer Therapy and Contacting the Team

1. Since your cancer was diagnosed, did a doctor or other member of your cancer therapy team talk with you about the reasons you might **want** to have chemotherapy or hormonal therapy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

2. Since your cancer was diagnosed, did a doctor or other member of your cancer therapy team talk with you about the reasons you might **not want** to have chemotherapy or hormonal therapy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

3. Did a doctor or other member of your cancer therapy team ask for your opinion about whether or not to have chemotherapy/hormonal therapy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

4. Did a doctor or other member of your cancer therapy team involve you in decisions about your chemotherapy or hormonal therapy as much as you wanted?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

5. Did any of your doctors recommend that you not have chemotherapy or hormonal therapy for your cancer? These can be doctors who were part of your cancer therapy team or any other doctors, anywhere.

1☐ Yes
2☐ No

6. Since it was decided that you would have chemotherapy or hormonal therapy to treat your cancer, did your cancer therapy team clearly explain how this treatment could affect your normal daily activities?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

The next items ask what you thought about the possible results and side effects of chemotherapy or hormonal therapy to treat your cancer, after talking with your cancer therapy team. If you have not thought about or discussed the issue, just answer that you do not know.

7. After talking with your cancer therapy team, how likely did you think it was that chemotherapy or hormonal therapy would help you live longer?

[1] ☐ Very likely
[2] ☐ Somewhat likely
[3] ☐ A little likely
[4] ☐ Not at all likely
[5] ☐ Don't Know

8. After talking with your cancer therapy team, how likely did you think it was that chemotherapy or hormonal therapy would cure your cancer?

[1] ☐ Very likely
[2] ☐ Somewhat likely
[3] ☐ A little likely
[4] ☐ Not at all likely
[5] ☐ Don't Know

9. After talking with your cancer therapy team, how likely did you think it was that chemotherapy or hormonal therapy would help improve symptoms you were having because of your cancer?

[1] ☐ Very likely
[2] ☐ Somewhat likely
[3] ☐ A little likely
[4] ☐ Not at all likely
[5] ☐ Not applicable, no cancer symptoms
[6] ☐ Don't Know

10. After talking with your cancer therapy team, how likely did you think it was that chemotherapy or hormonal therapy would have side-effects or complications?

[1] ☐ Very likely
[2] ☐ Somewhat likely
[3] ☐ A little likely
[4] ☐ Not at all likely
[5] ☐ Don't Know

11. After it was decided that you would have chemotherapy or hormonal therapy, did your cancer therapy team encourage you to contact them with questions between visits?

[1] ☐ Yes, definitely
[2] ☐ Yes, somewhat
[3] ☐ No

12. Did your cancer therapy team tell you to call them immediately if you have certain symptoms or side effects?

[1] ☐ Yes, definitely
[2] ☐ Yes, somewhat
[3] ☐ No

13. Did your cancer therapy team give you clear instructions about how to contact them outside of regular office hours?

[1] ☐ Yes, definitely
[2] ☐ Yes, somewhat
[3] ☐ No

14. Did you ever try to contact your cancer therapy team after hours?

1☐ Yes
2☐ No →**If No, go to #16**

15. When you tried to contact your cancer therapy team after hours, were you able to speak with a member of the team, or a clinician “on call” for your cancer therapy team?

1☐ Yes
2☐ No

16. In the last 6 months, how often did your cancer therapy team show respect for what you had to say?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

17. In the last 6 months, how often did your cancer therapy team listen carefully to you?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

18. In the last 6 months, how often was your cancer therapy team direct and straightforward when talking with you about your cancer and chemotherapy or hormonal therapy?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

19. In the last 6 months, did you talk with your cancer therapy team about any health questions or concerns related to your cancer treatment?

1☐ Yes
2☐ No →**If No, go to #21**

20. In the last 6 months, how often did your cancer therapy team give you easy-to-understand information about these health questions or concerns?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

21. In the last 6 months, how often did your cancer therapy team seem to know the important information about your medical history?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

22. In the last 6 months, how often did your cancer therapy team explain things in a way you could understand?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

23. In the last 6 months, how often did your cancer therapy team spend enough time with you?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

24. In the last 6 months, did your cancer therapy team delay your cancer treatment or a decision about your cancer treatment because they were missing test results or reports from other health professionals?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

25. In the last 6 months, did you get conflicting information about your care from different members of your cancer therapy team?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

26. In the last 6 months, did your cancer therapy team tell you what the next steps in your chemotherapy or hormonal therapy would be?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Appointments, Tests, Procedures, and Services

27. In the last 6 months, how many times did you visit your cancer therapy team's office in person for an appointment? Do **not** include telephone calls, emails, or overnight hospital stays.

1☐ 0 times→ **If 0 times, go to #29**
2☐ 1 to 5 times
3☐ 6 to 10 times
4☐ 11 or more times

28. How often were these office visits scheduled at times that were convenient for you?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

29. In the last 6 months, did you have blood tests, x-rays, scans, or other procedures as part of your cancer treatment? Do **not** include chemotherapy or hormonal therapy.

1☐ Yes
2☐ No →**If No, go to #31**

30. How often were the blood tests, x-rays, scans, or other procedures done as soon as you or your doctor thought you needed?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

31. In the last 6 months, how often did you have to wait longer for your test results than you expected?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

32. In the last 6 months, how often did your cancer therapy team explain test results in a way that was easy to understand?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

33. In the last 6 months, did your cancer therapy team prescribe medicine (other than chemotherapy or hormonal therapy) that you had not taken before?

1☐ Yes
2☐ No →**If No, go to #35**

34. In the last 6 months, did your cancer therapy team explain what that medicine was for in a way that was easy to understand?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Managing Symptoms

35. In the last 6 months, did you and your cancer therapy team talk about pain related to your cancer or your chemotherapy or hormonal therapy?

1☐ Yes
2☐ No

36. In the last 6 months, how much were you bothered by pain from your cancer or from your chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #38**
2☐ A little
3☐ Quite a bit
4☐ Very much

37. In the last 6 months, did your cancer therapy team try to help you deal with this pain?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

38. In the last 6 months, did you and your cancer therapy team talk about any changes in your energy levels related to your cancer or your chemotherapy or hormonal therapy?

1☐ Yes
2☐ No

39. In the last 6 months, how much were you bothered by changes in your energy level related to your cancer or your chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #41**
2☐ A little
3☐ Quite a bit
4☐ Very much

40. In the last 6 months, did your cancer therapy team try to help you deal with these changes in your energy levels?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

41. In the last 6 months, did you and your cancer therapy team talk about any emotional problems, such as anxiety or depression, related to your cancer or your chemotherapy or hormonal therapy?

1☐ Yes
2☐ No

42. In the last 6 months, how much were you bothered by any emotional problems, such as anxiety or depression, related to your cancer or chemotherapy or hormonal therapy?

[1] ☐ Not at all → **If Not at all, go to #44**
[2] ☐ A little
[3] ☐ Quite a bit
[4] ☐ Very much

43. In the last 6 months, did your cancer therapy team try to help you deal with these emotional problems?

[1] ☐ Yes, definitely
[2] ☐ Yes, somewhat
[3] ☐ No

44. In the last 6 months, how much were you bothered by nausea or vomiting related to your cancer or your chemotherapy or hormonal therapy?

[1] ☐ Not at all → **If Not at all, go to #46**
[2] ☐ A little
[3] ☐ Quite a bit
[4] ☐ Very much

45. In the last 6 months, did your cancer therapy team try to help you deal with this nausea/vomiting?

[1] ☐ Yes, definitely
[2] ☐ Yes, somewhat
[3] ☐ No

46. In the last 6 months, how much were you bothered by difficulty breathing related to your cancer or your chemotherapy or hormonal therapy?

[1] ☐ Not at all → **If Not at all, go to #48**
[2] ☐ A little
[3] ☐ Quite a bit
[4] ☐ Very much

47. In the last 6 months, did your cancer therapy team try to help you deal with this difficulty breathing?

[1] ☐ Yes, definitely
[2] ☐ Yes, somewhat
[3] ☐ No

48. In the last 6 months, how much were you bothered by coughing related to your cancer or your chemotherapy or hormonal therapy?

[1] ☐ Not at all → **If Not at all, go to #50**
[2] ☐ A little
[3] ☐ Quite a bit
[4] ☐ Very much

49. In the last 6 months, did your cancer therapy team try to help you deal with this cough?

[1] ☐ Yes, definitely
[2] ☐ Yes, somewhat
[3] ☐ No

50. In the last 6 months, how much were you bothered by constipation or diarrhea related to your cancer or your chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #52**
2☐ A little
3☐ Quite a bit
4☐ Very much

51. In the last 6 months, did your cancer therapy team try to help you deal with this constipation or diarrhea?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

52. In the last 6 months, how much were you bothered by neuropathy (pain or tingling in your feet or hands) related to your chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #54**
2☐ A little
3☐ Quite a bit
4☐ Very much

53. In the last 6 months, did your cancer therapy team try to help you deal with this neuropathy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Additional Services

54. In the last 6 months, did you and your cancer therapy team talk about additional services to manage your cancer care at home, such as home health care, special medical equipment, or special supplies?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

55. In the last 6 months, did you need additional services to manage your cancer care at home, such as home health care, special medical equipment, or special supplies?

1☐ Yes
2☐ No →**If No, go to #58**

56. Did you need help arranging for these additional services?

1☐ Yes
2☐ No →**If No, go to #58**

57. Did your cancer therapy team help arrange for these additional services?

1☐ Yes
2☐ No

58. In the last 6 months, did you and your cancer therapy team talk about things you can do to maintain your health during cancer treatment, such as what to eat and what exercises to do?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Family and Caregivers

59. In the last 6 months, were any family members or **close** friends present during discussions with your cancer therapy team about your cancer or cancer care?

- 1☐ Yes
- 2☐ No →**If No, go to #61**

60. In the last 6 months, did your cancer therapy team involve your family members or **close** friends in discussions as much as you wanted?

- 1☐ Yes, definitely
- 2☐ Yes, somewhat
- 3☐ No

Language Interpreter Services

An interpreter is a person who repeats what someone says in a language used by another person; for example Spanish, Russian, Chinese, or American Sign Language.

61. In the last 6 months, did you want an interpreter to help you speak with your cancer therapy team?

- 1☐ Yes
- 2☐ No →**If No, go to #63**

62. In the last 6 months, how often did your cancer therapy team provide an interpreter?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

Overall Rating

63. Using any number from 0 to 10, where 0 is the worst cancer therapy team possible and 10 is the best cancer therapy team possible, what number would you use to rate your cancer therapy team over the last 6 months?

- ☐ 0 Worst Cancer Therapy Team Possible
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10 Best Cancer Therapy Team Possible

Health Status

The next questions are about your health state *today*. [If you are filling out this survey on behalf of someone who has passed away, please skip this section and go to #76.]

64. In general, how would you rate your overall health today?

- 1☐ Excellent
- 2☐ Very good
- 3☐ Good
- 4☐ Fair
- 5☐ Poor

65. In general, how would you rate your overall **mental or emotional** health today?

1☐ Excellent
2☐ Very good
3☐ Good
4☐ Fair
5☐ Poor

66. Would you say you have no problems in walking about, some problems in walking about, or you are confined to bed?

1☐ No problems walking about
2☐ Some problems walking about
3☐ You are confined to bed

67. Would you say you have no problems with self-care, some problems washing or dressing yourself, or you are unable to wash or dress yourself?

1☐ No problems with self-care
2☐ Some problems washing or dressing yourself
3☐ You are unable to wash or dress yourself

68. Would you say you have no problems performing your usual activities, some problems performing your usual activities, or you are unable to perform your usual activities? Please consider work, study, housework, family, or leisure activities.

1☐ No problems performing your usual activities
2☐ Some problems performing your usual activities
3☐ You are unable to perform your usual activities

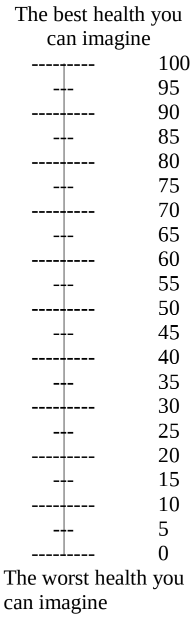
69. Would you say you have no pain or discomfort, moderate pain or discomfort or extreme pain or discomfort?

1☐ No pain or discomfort
2☐ Moderate pain or discomfort
3☐ Extreme pain or discomfort

70. Would you say that you are not anxious or depressed, moderately anxious or depressed, or extremely anxious or depressed?

1☐ Not anxious or depressed
2☐ Moderately anxious or depressed
3☐ Extremely anxious or depressed

71. We would like to know how good or bad your health is TODAY. This scale is numbered from 0 to 100. 100 means the best health you can imagine. 0 means the worst health you can imagine. Mark an X on the scale to indicate how your health is TODAY.



Now, please write the number you marked on the scale in the box below.

YOUR HEALTH TODAY = ☐☐☐

72. How do you prefer to make decisions about your cancer treatment?

1☐ **You** prefer to mainly make the decisions
2☐ You prefer for **you and your doctor** to make the decisions together
3☐ You prefer for **your doctor** to mainly make the decisions

73. Are you still receiving chemotherapy or hormonal therapy today?

1☐ Yes
2☐ No

Patients, whether healthy or sick, may talk with their Cancer Therapy Team about their goals and wishes if someday they become very sick or close to dying.

74. Have you **ever** talked with a doctor or other member of your cancer therapy team about your wishes, if you become very ill or close to dying?

1☐ Yes
2☐ No

75. If you had to make a choice today, would you prefer treatment that extends your life as much as possible, even if it means having more pain and discomfort, or would you want treatment that focuses on relieving pain and discomfort as much as possible, even if it means not living as long?

1☐ Extend life as much as possible
2☐ Relieve pain or discomfort as much as possible
3☐ Don’t Know

About You

The following questions are about you (the cancer patient).

76. What is your age?

1☐ 18 to 44
2☐ 45-64
3☐ 65-74
4☐ 75-84
5☐ 85 or older

77. Are you male or female?

1☐ Male
2☐ Female

78. What is the highest grade or level of school that you completed?

1☐ 8th grade or less
2☐ Some high school, but did not graduate
3☐ High school graduate or GED
4☐ Some college or 2-year degree
5☐ 4-year college graduate
6☐ More than 4-year college degree

79. Are you of Hispanic or Latino origin or descent?

1☐ Yes, Hispanic or Latino
2☐ No, not Hispanic or Latino

80. What is your race? Please mark one or more.

1☐ White
2☐ Black or African American
3☐ Asian
4☐ Native Hawaiian or Other Pacific Islander
5☐ American Indian or Alaska Native
6☐ Other

81. In addition to Medicare, do you have any supplemental insurance that helps cover the cost of copayments, coinsurance, and deductibles?

1☐ Yes
2☐ No
3☐ Don't know

82. Thinking about everything you paid for <u>with your own money</u> in the past year for care related to your cancer or medications to treat it, that was not covered by insurance, how much did you spend?

1☐ Less than $100
2☐ $100-$499
3☐ $500-$999
4☐ $1000-$1999
5☐ $2000-$4999
6☐ $5000 or more
98☐ I don't know

83. Who is answering this survey?

1☐ Me, the person it was addressed to, by myself
2☐ Me, with help from someone else
3☐ Someone else answered the questions for me
4☐ Someone else completed this survey on behalf of a person who has passed away

Thank you for completing this survey. Please return it in the postage-paid envelope.

G.2 Alternative Patient Survey Instrument

Survey of Patients’ Experiences with Cancer Care

Medicare records show that the person named in the attached letter was treated for cancer and recently passed away. Our condolences to you and your family for your loss.

This survey asks about the cancer care your loved one received in his or her last six months of life. Please answer as you think the person would have answered. This survey will help Medicare improve care for patients with cancer. We understand you may not know the answers to all survey questions; please feel free to skip any items for which you don’t know the answer.

Survey Instructions

Answer each question by marking the box to the left of your answer.

You are sometimes told to skip over some questions in this survey. When this happens you will see an arrow with a note that tells you what question to answer next, like this:

☐ Yes
☒ No →**If No, go to #1 on Page 3**

Please return this survey in the enclosed prepaid envelope to:

Abt SRBI
55 Wheeler Street
Cambridge, MA 02138

This survey is about the care related to the medicines your loved one (named in the attached letter) received to treat cancer during the last 6 months of his or her life. This medicine could be in the form of an infusion, an injection, or a pill. This medicine could be chemotherapy (including immunotherapy and other targeted therapies) or hormonal therapy. This survey is *not* about cancer surgery or about radiation treatment.

As you answer the survey, please think about the doctors and nurses and their support staff who were *most responsible for managing your love one's care* related to chemotherapy or hormonal therapy, during the last 6 months. Together, these persons are called the "cancer therapy team". This survey refers to your deceased loved one as "the patient".

Understanding Cancer Therapy and Contacting the Team

1. After the patient was diagnosed with cancer, did a doctor or other member of the cancer therapy team talk with the patient about the reasons he or she might **want** to have chemotherapy or hormonal therapy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

2. After the patient was diagnosed with cancer, did a doctor or other member of the cancer therapy team talk with the patient about the reasons he or she might **not want** to have chemotherapy or hormonal therapy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

3. Did a doctor or other member of the cancer therapy team ask for the patient's opinion about whether or not to have chemotherapy/hormonal therapy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

4. Did a doctor or other member of the patient's cancer therapy team involve the patient in decisions about chemotherapy or hormonal therapy as much as the patient wanted?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

5. Did any of the patient's doctors recommend that he or she should not have chemotherapy or hormonal therapy for cancer? These can be doctors who were part of the cancer therapy team or any other doctors, anywhere.

1☐ Yes
2☐ No

6. After it was decided that the patient should have chemotherapy or hormonal therapy to treat cancer, did the cancer therapy team clearly explain how this treatment could affect the patient's normal daily activities?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

The next items ask what the patient thought about the possible results and side effects of chemotherapy or hormonal therapy to treat cancer, after talking with the cancer therapy team. If the patient never thought about or discussed the issue, or never mentioned this to you, just answer that you do not know.

7. After talking with the cancer therapy team, how likely did the patient think it was that chemotherapy or hormonal therapy would help him or her live longer?

^{1}☐ Very likely
^{2}☐ Somewhat likely
^{3}☐ A little likely
^{4}☐ Not at all likely
^{5}☐ Don’t Know

8. After talking with the cancer therapy team, how likely did the patient think it was that chemotherapy or hormonal therapy would cure his or her cancer?

^{1}☐ Very likely
^{2}☐ Somewhat likely
^{3}☐ A little likely
^{4}☐ Not at all likely
^{5}☐ Don’t Know

9. After talking with the cancer therapy team, how likely did the patient think it was that chemotherapy or hormonal therapy would help improve symptoms he or she was having because of cancer?

^{1}☐ Very likely
^{2}☐ Somewhat likely
^{3}☐ A little likely
^{4}☐ Not at all likely
^{5}☐ Not applicable, no cancer symptoms
^{6}☐ Don’t Know

10. After talking with the cancer therapy team, how likely did the patient think it was that chemotherapy or hormonal therapy would have side-effects or complications?

^{1}☐ Very likely
^{2}☐ Somewhat likely
^{3}☐ A little likely
^{4}☐ Not at all likely

^{5}☐ Don’t Know

11. After it was decided that the patient would have chemotherapy or hormonal therapy, did the cancer therapy team encourage the patient to contact them with questions between visits?

^{1}☐ Yes, definitely
^{2}☐ Yes, somewhat
^{3}☐ No

12. Did the cancer therapy team tell the patient to call them immediately if he or she had certain symptoms or side effects?

^{1}☐ Yes, definitely
^{2}☐ Yes, somewhat
^{3}☐ No

13. Did the cancer therapy team give the patient clear instructions about how to contact them outside of regular office hours?

^{1}☐ Yes, definitely
^{2}☐ Yes, somewhat
^{3}☐ No

14. Did the patient ever try to contact the cancer therapy team after hours?

- 1☐ Yes
- 2☐ No →**If No, go to #16**

15. When the patient tried to contact the cancer therapy team after hours, was he or she able to speak with a member of the team, or a clinician "on call" for the cancer therapy team?

- 1☐ Yes
- 2☐ No

16. In the last 6 months of life, how often did the cancer therapy team show respect for what the patient had to say?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

17. In the last 6 months of life, how often did the cancer therapy team listen carefully to the patient?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

18. In the last 6 months of life, how often was the cancer therapy team direct and straightforward when talking with the patient about cancer and chemotherapy or hormonal therapy?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

19. In the last 6 months of life, did the patient talk with the cancer therapy team about any health questions or concerns related to cancer treatment?

- 1☐ Yes
- 2☐ No →**If No, go to #21**

20. In the last 6 months of life, how often did the cancer therapy team give the patient easy-to-understand information about these health questions or concerns?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

21. In the last 6 months of life, how often did the cancer therapy team seem to know the important information about the patient's medical history?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

22. In the last 6 months of life, how often did the cancer therapy team explain things in a way that the patient could understand?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

23. In the last 6 months of life, how often did the cancer therapy team spend enough time with the patient?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always

24. In the last 6 months of life, did the cancer therapy team delay the patient's cancer treatment or a decision about cancer treatment because they were missing test results or reports from other health professionals?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

25. In the last 6 months of life, did the patient get conflicting information from different members of the cancer therapy team?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

26. In the last 6 months of life, did the cancer therapy team tell the patient what the next steps in chemotherapy or hormonal therapy would be?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Appointments, Tests, Procedures, and Services

27. In the last 6 months of life, how many times did the patient visit the cancer therapy team's office in person for an appointment? Do **not** include telephone calls, emails, or overnight hospital stays.

1☐ 0 times→ **If 0, go to #29**
2☐ 1 to 5 times
3☐ 6 to 10 times
4☐ 11 or more times

28. How often were these office visits scheduled at times that were convenient for the patient?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

29. In the last 6 months of life, did the patient have blood tests, x-rays, scans, or other procedures as part of cancer treatment? Do **not** include chemotherapy or hormonal therapy.

1☐ Yes
2☐ No **→If No, go to #31**

30. How often were the blood tests, x-rays, scans, or other procedures done as soon as the patient and his or her doctor thought was needed?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

31. In the last 6 months of life, how often did the patient have to wait longer for test results than he or she expected?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

32. In the last 6 months of life, how often did the cancer therapy team explain test results in a way that was easy to understand?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

33. In the last 6 months of life, did the cancer therapy team prescribe medicine (other than chemotherapy or hormonal therapy) that the patient had not taken before?

1☐ Yes
2☐ No →**If No, go to #35**

34. In the last 6 months of life, did the cancer therapy team explain what that medicine was for in a way that was easy to understand?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Managing Symptoms

35. In the last 6 months of life, did the patient and his or her cancer therapy team talk about pain related to cancer or chemotherapy or hormonal therapy?

1☐ Yes
2☐ No

36. In the last 6 months of life, how much was the patient bothered by pain from cancer or from chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #38**
2☐ A little
3☐ Quite a bit
4☐ Very much

37. In the last 6 months of life, did the cancer therapy team try to help the patient deal with this pain?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

38. In the last 6 months of life, did the patient and his or her cancer therapy team talk about any changes in energy levels related to cancer or chemotherapy or hormonal therapy?

1☐ Yes
2☐ No

39. In the last 6 months of life, how much was the patient bothered by changes in energy level related to cancer or chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #41**
2☐ A little
3☐ Quite a bit
4☐ Very much

40. In the last 6 months of life, did the cancer therapy team try to help the patient deal with these changes in energy levels?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

41. In the last 6 months of life, did the patient and his or her cancer therapy team talk about any emotional problems, such as anxiety or depression, related to cancer or chemotherapy or hormonal therapy?

1☐ Yes
2☐ No

42. In the last 6 months of life, how much was the patient bothered by any emotional problems, such as anxiety or depression, related to cancer or chemotherapy or hormonal therapy?

- 1☐ Not at all → **If Not at all, go to #44**
- 2☐ A little
- 3☐ Quite a bit
- 4☐ Very much

43. In the last 6 months of life, did the cancer therapy team try to help the patient deal with these emotional problems?

- 1☐ Yes, definitely
- 2☐ Yes, somewhat
- 3☐ No

44. In the last 6 months of life, how much was the patient bothered by nausea or vomiting related to cancer or chemotherapy or hormonal therapy?

- 1☐ Not at all → **If Not at all, go to #46**
- 2☐ A little
- 3☐ Quite a bit
- 4☐ Very much

45. In the last 6 months of life, did the cancer therapy team try to help the patient deal with this nausea/vomiting?

- 1☐ Yes, definitely
- 2☐ Yes, somewhat
- 3☐ No

46. In the last 6 months of life, how much was the patient bothered by difficulty breathing related to cancer or chemotherapy or hormonal therapy?

- 1☐ Not at all → **If Not at all, go to #48**
- 2☐ A little
- 3☐ Quite a bit
- 4☐ Very much

47. In the last 6 months of life, did the cancer therapy team try to help the patient deal with this difficulty breathing?

- 1☐ Yes, definitely
- 2☐ Yes, somewhat
- 3☐ No

48. In the last 6 months of life, how much was the patient bothered by coughing related to cancer or chemotherapy or hormonal therapy?

- 1☐ Not at all → **If Not at all, go to #50**
- 2☐ A little
- 3☐ Quite a bit
- 4☐ Very much

49. In the last 6 months of life, did the cancer therapy team try to help the patient deal with this cough?

- 1☐ Yes, definitely
- 2☐ Yes, somewhat
- 3☐ No

50. In the last 6 months of life, how much was the patient bothered by constipation or diarrhea related to cancer or chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #52**
2☐ A little
3☐ Quite a bit
4☐ Very much

51. In the last 6 months of life, did the cancer therapy team try to help the patient deal with this constipation or diarrhea?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

52. In the last 6 months of life, how much was the patient bothered by neuropathy (pain or tingling in feet or hands) related to chemotherapy or hormonal therapy?

1☐ Not at all →**If Not at all, go to #54**
2☐ A little
3☐ Quite a bit
4☐ Very much

53. In the last 6 months of life, did the cancer therapy team try to help the patient deal with this neuropathy?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Additional Services

54. In the last 6 months of life, did the patient and his or her cancer therapy team talk about additional services to manage cancer care at home, such as home health care, special medical equipment, or special supplies?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐No

55. In the last 6 months of life, did the patient need additional services to manage cancer care at home, such as home health care, special medical equipment, or special supplies?

1☐ Yes
2☐ No →**If No, go to #58**

56. Did the patient need help arranging for these additional services?

1☐ Yes
2☐ No →**If No, go to #58**

57. Did the cancer therapy team help arrange for these additional services?

1☐ Yes
2☐ No

Family and Caregivers

58. In the last 6 months of life, were any family members or **close** friends present during discussions with the cancer therapy team about the patient's cancer or cancer care?

1☐ Yes
2☐ No →**If No, go to #60**

59. In the last 6 months of life, did the cancer therapy team involve the patient's family members or **close** friends in discussions as much as the patient wanted?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

Language Interpreter Services

An interpreter is a person who repeats what someone says in a language used by another person; for example Spanish, Russian, Chinese, or American Sign Language.

60. In the last 6 months of life, did the patient want an interpreter to help him or her speak with the cancer therapy team?

1☐ Yes
2☐ No →**If No, go to #62**

61. In the last 6 months of life, how often did the cancer therapy team provide an interpreter?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always

Overall Rating

62. Using any number from 0 to 10, where 0 is the worst cancer therapy team possible and 10 is the best cancer therapy team possible, what number would the patient have given to rate the cancer therapy team over the last 6 months?

☐ 0 Worst Cancer Therapy Team Possible
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
☐ 8
☐ 9
☐ 10 Best Cancer Therapy Team Possible

Care at the End of Life

Hospice provides a wide range of medical and supportive services to patients with life-threatening illnesses. These services are provided to both patients and their families. Hospice care may be provided in the home or is sometimes provided in a nursing home or special hospice facility. It involves a team-oriented approach to expert medical care, pain management, and emotional and spiritual support expressly tailored to the patient's needs and wishes.

63. Did any doctor or other health care provider ever discuss hospice care with the patient or his or her family?

1☐ Yes
2☐ No →**If No, go to #65**
3☐ Don't Know →**If Don't Know, go to #65**

64. Who discussed hospice care with the patient or his or her family? Mark all that apply.

1☐ Cancer physician/oncologist or nurse
2☐ Another physician or nurse who was not part of the cancer therapy team (for example, a primary care physician)
3☐ Don't Know

65. Did the patient ever receive hospice care?

1☐ Yes
2☐ No →**If No, go to #67**

66. Do you think the patient began hospice at the right time, or was it too late or too early?

1☐ At the right time
2☐ Too late
3☐ Too early
4☐ Don't Know

For the following items, consider all care that the patient received in the last month of life. Care providers could include cancer physicians/oncologists, nurses, home health care providers, or hospice care providers.

67. Whether or not the patient received hospice care, how would you rate the overall care that the patient received in his or her last month of life?

1☐ Excellent
2☐ Very good
3☐ Good
4☐ Fair
5☐ Poor
6☐ Don't Know

68. In the last month of life, how often did the patient's care providers show respect for what he or she had to say?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always
5☐ Don't Know

69. In the last month of life, how often did the patient's care providers listen carefully to him or her?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always
5☐ Don't Know

70. In the last month of life, how often were the patient's care providers direct and straight-forward when talking with him or her?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always
5☐ Don't Know

71. In the last month of life, how often did the patient's care providers explain things in a way he or she could understand?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always
5☐ Don't Know

72. In the last month of life, how often did the patient's care providers spend enough time with him or her?

- 1☐ Never
- 2☐ Sometimes
- 3☐ Usually
- 4☐ Always
- 5☐ Don't Know

73. In the last month of life, did the patient get conflicting information about care from different care providers?

- 1☐ Yes, definitely
- 2☐ Yes, somewhat
- 3☐ No
- 4☐ Don't Know

74. During the last month of the patient's life, would you say that he or she (1) preferred a plan of care that focused on extending life as long as possible, even if it meant more pain and discomfort, or (2) preferred a plan of care that focused on relieving pain and discomfort as much as possible, even if that meant not living as long?

- 1☐ Extend life as long as possible
- 2☐ Relieve pain and discomfort as much as possible
- 3☐ Don't Know→**If Don't Know, go to #76**

75. To what extent did the patients' care providers follow these wishes (in previous question) in the patient's last month of life?

- 1☐ A great deal
- 2☐ Somewhat
- 3☐ Not at all
- 4☐ Don't Know

76. Where was the patient when he or she died?

- 1☐ Hospital
- 2☐ Home
- 3☐ Relative's home
- 4☐ Nursing facility/Inpatient hospice
- 5☐ Other
- 6☐ Don't Know

77. In your opinion, what was the patient's preferred place of death?

- 1☐ Hospital
- 2☐ Home
- 3☐ Relative's home
- 4☐ Nursing facility/Inpatient hospice
- 5☐ Other
- 6☐ Don't Know

About the Cancer Patient

The following questions are about the cancer patient.

78. How old was the patient when he or she died?

- 1☐ 18 to 44
- 2☐ 45-64
- 3☐ 65-74
- 4☐ 75-84
- 5☐ 85 or older

79. Was the patient male or female?

- 1☐ Male
- 2☐ Female

80. What was the highest grade or level of school that the patient completed?

1☐ 8th grade or less
2☐ Some high school, but did not graduate
3☐ High school graduate or GED
4☐ Some college or 2-year degree
5☐ 4-year college graduate
6☐ More than 4-year college degree

81. Was the patient of Hispanic or Latino origin or descent?

1☐ Yes, Hispanic or Latino
2☐ No, not Hispanic or Latino

82. What was the patient's race? Please mark one or more.

1☐ White
2☐ Black or African American
3☐ Asian
4☐ Native Hawaiian or Other Pacific Islander
5☐ American Indian or Alaska Native
6☐ Other

83. In addition to Medicare, did the patient have any supplemental insurance that helped cover the cost of copayments, coinsurance, and deductibles?

1☐ Yes
2☐ No
3☐ Don't know

84. Thinking about everything the patient paid for <u>with his or her own money</u> in the past year for care related to cancer or medications to treat it, that was not covered by insurance, how much did the patient spend?

1☐ Less than $100
2☐ $100-$499
3☐ $500-$999
4☐ $1000-$1999
5☐ $2000-$4999
6☐ $5000 or more
98☐ I don't know

85. To whomever is filling out this survey: What was your relationship to the patient?

1☐ Spouse/Partner
2☐ Child
3☐ Brother or sister
4☐ Friend or neighbor
5☐ Other

Thank you for completing this survey. Please return it in the postage-paid envelope.

G.3 Decedent Patient Survey Instrument

Survey of Cancer Patients' Experiences with End of Life Care

Medicare records show that the person named in the attached letter was treated for cancer and recently passed away. Our condolences to you and your family for your loss.

This survey asks about the care your loved one received in the last weeks of life. Please answer as you think the person would have answered. This survey will help Medicare improve care for patients with cancer. We understand you may not know the answers to all survey questions; please feel free to skip any items for which you don't know the answer.

Survey Instructions

Answer each question by marking the box to the left of your answer.

You are sometimes told to skip over some questions in this survey. When this happens you will see an arrow with a note that tells you what question to answer next, like this:

☐ Yes
☒ No →**If No, go to #1 on Page 3**

Please return this survey in the enclosed prepaid envelope to:

Abt SRBI
55 Wheeler Street
Cambridge, MA 02138

This survey refers to your deceased loved one as “the patient.”

Hospice provides a wide range of medical and supportive services to patients with life-threatening illnesses. These services are provided to both patients and their families. Hospice care may be provided in the home or is sometimes provided in a nursing home or special hospice facility. It involves a team-oriented approach to expert medical care, pain management, and emotional and spiritual support expressly tailored to the patient's needs and wishes.

1. Did any doctor or other health care provider ever discuss hospice care with the patient or his or her family?

- 1 ☐ Yes
- 2 ☐ No →**If No, go to #3**
- 3 ☐ Don’t Know →**If Don’t Know, go to #3**

2. Who discussed hospice care with the patient or his or her family? Mark all that apply.

- 1 ☐ Cancer physician/oncologist or nurse
- 2 ☐ Another physician or nurse who was not part of the cancer therapy team (for example, a primary care physician)
- 3 ☐ Don’t Know

3. Did the patient ever receive hospice care?

- 1 ☐ Yes
- 2 ☐ No →**If No, go to #5**

4. Do you think the patient began hospice at the right time, or was it too late or too early?

- 1 ☐ At the right time
- 2 ☐ Too late
- 3 ☐ Too early
- 4 ☐ Don’t Know

For the following items, consider all care that the patient received in the last month of life. Care providers could include cancer physicians/oncologists, nurses, home health care providers, or hospice care providers.

5. Whether or not the patient received hospice care, how would you rate the overall care that the patient received in his or her last month of life?

- 1 ☐ Excellent
- 2 ☐ Very good
- 3 ☐ Good
- 4 ☐ Fair
- 5 ☐ Poor
- 6 ☐ Don’t Know

6. In the last month of life, how often did the patient’s care providers show respect for what he or she had to say?

- 1 ☐ Never
- 2 ☐ Sometimes
- 3 ☐ Usually
- 4 ☐ Always
- 5 ☐ Don’t Know

7. In the last month of life, how often did the patient’s care providers listen carefully to him or her?

- 1 ☐ Never
- 2 ☐ Sometimes
- 3 ☐ Usually
- 4 ☐ Always
- 5 ☐ Don’t Know

8. In the last month of life, how often were the patient’s care providers direct and straightforward when talking with him or her?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always
5☐ Don’t Know

9. In the last month of life, how often did the patient’s care providers explain things in a way he or she could understand?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always
5☐ Don’t Know

10. In the last month of life, how often did the patient’s care providers spend enough time with him or her?

1☐ Never
2☐ Sometimes
3☐ Usually
4☐ Always
5☐ Don’t Know

11. In the last month of life, did the patient get conflicting information about care from different care providers?

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No
4☐ Don’t Know

12. During the last month of the patient’s life, would you say that he or she (1) preferred a plan of care that focused on extending life as long as possible, even if it meant more pain and discomfort, or (2) preferred a plan of care that focused on relieving pain and discomfort as much as possible, even if that meant not living as long?

1☐ Extend life as long as possible
2☐ Relieve pain and discomfort as much as possible
3☐ Don’t Know→**If Don’t Know, go to #14**

13. To what extent did the patients’ care providers follow these wishes (in previous question) in the patient’s last month of life?

1☐ A great deal
2☐ Somewhat
3☐ Not at all
4☐ Don’t Know

14. Where was the patient when he or she died?

1☐ Hospital
2☐ Home
3☐ Relative’s home
4☐ Nursing facility/Inpatient hospice
5☐ Other
6☐ Don’t Know

15. In your opinion, what was the patient’s preferred place of death?

1☐ Hospital
2☐ Home
3☐ Relative’s home
4☐ Nursing facility/Inpatient hospice
5☐ Other
6☐ Don’t Know

The following questions are about the cancer patient.

16. How old was the patient when he or she died?

1☐ 18 to 44
2☐ 45-64
3☐ 65-74
4☐ 75-84
5☐ 85 or older

17. Was the patient male or female?

1☐ Male
2☐ Female

18. What was the highest grade or level of school that the patient completed?

1☐ 8th grade or less
2☐ Some high school, but did not graduate
3☐ High school graduate or GED
4☐ Some college or 2-year degree
5☐ 4-year college graduate
6☐ More than 4-year college degree

19. Was the patient of Hispanic or Latino origin or descent?

1☐ Yes, Hispanic or Latino
2☐ No, not Hispanic or Latino

20. What was the patient's race? Please mark one or more.

1☐ White
2☐ Black or African American
3☐ Asian
4☐ Native Hawaiian or Other Pacific Islander
5☐ American Indian or Alaska Native
6☐ Other

21. In addition to Medicare, did the patient have any supplemental insurance that helped cover the cost of copayments, coinsurance, and deductibles?

1☐ Yes
2☐ No
3☐ Don't know

22. Thinking about everything the patient paid for with his or her own money in the past year for care related to cancer or medications to treat it, that was not covered by insurance, how much did the patient spend?

1☐ Less than $100
2☐ $100-$499
3☐ $500-$999
4☐ $1000-$1999
5☐ $2000-$4999
6☐ $5000 or more
98☐ I don't know

23. To whomever is filling out this survey: What was your relationship to the patient?

1☐ Spouse/Partner
2☐ Child
3☐ Brother or sister
4☐ Friend or neighbor
5☐ Other

Thank you for completing this survey. Please return it in the postage-paid envelope.