EVALUATION OF THE ONCOLOGY CARE MODEL

Performance Period One

Final

December 2018

Contract #HHSM-500-2014-000261 T0003

SUBMITTED BY:

Abt Associates
Andrea Hassol, Project Director
6130 Executive Boulevard
Rockville, MD 20852

IN PARTNERSHIP WITH

The Lewin Group
Harvard Medical School
GDIT
Geisel School of Medicine at Dartmouth

PREPARED FOR:

Susannah Cafardi
Center for Medicare & Medicaid Innovation
Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, MD 21244

AUTHORS:

Abt Associates: Andrea Hassol, Qian Gu, T.J. Christian, Gabriella Newes-Adeyi, Sean McClellan, Giulia Norton, Patricia Rowan, Brenda Karkos, Rebecca Freeman-Slade,

The Lewin Group: Carol Simon, Shalini Jhatakia, Donna Spencer, Amanda Tripp, Sara Kizer, Richard Svoboda, Inna Cintina, Madison Davidson, Chloe Mitchell

Harvard Medical School: Nancy Keating, Mary Beth Landrum, Lauren Riedel, Michael Liu, Robert Wolf

Geisel School of Medicine at Dartmouth: Gabriel Brooks

General Dynamics Information Technology: Colleen Kummet, Van Doren Hsu

ACKNOWLEDGMENTS:

The evaluation team would also like to recognize contributions from additional team members:

Abt Associates: Olivia Jung, Seyoun Kim, Samuel Dastrup, Claire Hoffman

The Lewin Group: Desiree Froshaug, David Zhang, Laura Schmiel, Stephen Muldoon, Jonathan van Arneman, Theodore Kirby

Harvard Medical School: Barbara McNeil, Nancy Beaulieu, Michael Chernew, Anupam Jena, Joyce Lii

GDIT: Glenda Martens, Yishu He

Executive Summary

Introduction

In February 2015, the Centers for Medicare and Medicaid Services (CMS) invited oncology physician group practices to participate in the Oncology Care Model (OCM), an episode-based alternative payment model (APM) for cancer care. OCM tests whether additional funding for enhanced services and financial incentives to improve the quality and appropriateness of care provided to Medicare Fee-For-Service (FFS) beneficiaries, can improve quality and reduce Medicare spending for patients undergoing chemotherapy for cancer. CMS invited other payers to operate similar models for their insured patients served by OCM oncology practices. The Model launched on July 1, 2016 with nearly 200 oncology group practices and 17 payers participating.

The OCM evaluation uses a difference-in-differences (DID) approach, in which a matched comparison group is used to estimate what would have happened in the absence of OCM. The *First Annual Report from the Evaluation of the Oncology Care Model: Baseline Period*[1] explored the construction of an evaluation comparison group, and the trends during a multi-year baseline period for both the OCM and comparison groups.

The current report, *Evaluation of the Oncology Care Model: Performance Period One*, measures program implementation and outcomes for six-month chemotherapy treatment episodes that began between July 1, 2016 and January 1, 2017, and ended by June 30, 2017 (hereafter referred to as Performance Period One or PP1). During PP1, many participating practices were hiring staff, enhancing oncology services, improving electronic health record systems, establishing new care processes and workflows, and learning to analyze the feedback reports and data provided by CMS. The mixed methods evaluation uses claims data to measure episode-level impacts on utilization, cost, and clinical treatment outcomes, survey data to measure patient- and family-reported care experiences, reporting from the participating practices to understand care delivery changes they are implementing, and qualitative data from case studies and interviews to understand how participants are redesigning care delivery and the context surrounding observed impacts. Claims data are from PP1 and data from surveys, practice reporting, case studies, and interviews are from July 1, 2016 – June 30, 2017.

Model Overview

OCM is a five-year model consisting of six-month episodes that began in mid-2016. The goals of OCM include improving care coordination and access to care for Medicare beneficiaries receiving chemotherapy for cancer. OCM leverages a two-pronged approach to incentivize the provision of high-quality care. It includes a $160 Monthly Enhanced Oncology Services (MEOS) per-beneficiary per-month payment and the potential to earn performance-based payments (PBPs). Enhanced oncology services include the following:

[1] 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.

- 24/7 patient access to an appropriate clinician who has real-time access to the patient's medical records
- Core functions of patient navigation
- A documented Care Plan for every OCM patient that contains 13 components recommended by the Institute of Medicine (IOM)
- Cancer treatment that is consistent with nationally recognized clinical guidelines

OCM applies to FFS beneficiaries with all types of cancer who are undergoing chemotherapy treatment.[2] OCM combines attributes of medical homes with financial incentives for providing these services efficiently, and with high quality.[3]

Summary of Key Findings

Characteristics of Participating Practices and the Episodes of Care They Provided

OCM and comparison practices were well matched in the baseline period. The balance of the two samples and the degree to which these practices are similar to the national sample are discussed in the Baseline Report. This current report focuses on PP1, relative to the baseline period. In general, both the OCM and comparison practices experienced similar changes in practice structure and episode mix during PP1.

Affiliation with hospitals/health systems increased for both OCM and comparison practices,[4] likely reflecting broader industry consolidation. There was little change for OCM or comparison practices in the demographics of beneficiaries they served or the type and severity of cancer episodes.

Use of immunotherapies and Part D (oral) chemotherapy increased in both OCM and comparison practices, reflecting national trends in the rapid adoption of newly-approved treatments. We found no evidence that OCM restricted use of immunotherapies, despite the high cost of these treatments.

Episode Utilization and Cost

Among the anticipated effects of the OCM Model and the increased use of enhanced services are better coordination of care and access to the oncology care team, and thus reduction of unnecessary utilization and lower costs. We compared changes between the baseline and PP1 in the OCM group with changes in the comparison group. During PP1, while magnitudes were small and only use of intensive care units and emergency department (ED) visits reached the level of statistical significance, all five hospital utilization measures (any inpatient hospitalizations, number of inpatient hospitalizations, number of ICU admissions, number of inpatient days per episode, or 30-day readmissions per episode) declined more for OCM episodes than for comparisons, as did visits to EDs. This consistent pattern may be an early signal of OCM impact in reducing use of hospital-based services. Total episode cost of care (TCOC) without MEOS declined in both groups, but slightly more (although not statistically significant) for OCM episodes than for comparisons ($173 greater decline for OCM episodes than comparisons), which is consistent with the small reduction in service utilization observed. This change in TCOC represents a 0.6 percent reduction since the baseline.

---

[2] Chemotherapy is defined for OCM purposes as cytotoxic chemotherapy, immunotherapy, or hormonal therapy for cancer.

[3] More information about OCM can be found at: https://innovation.cms.gov/initiatives/oncology-care/

In the first performance period (PP), OCM did not yet have a detectable impact on any distinct component of cost, with the exception of Part D chemotherapy costs, which increased more for OCM episodes than for comparisons ($294 or 6.3 percent) reflecting an increase in use of oral chemotherapy, as noted above.

Enhanced Oncology Services

After a three-month start-up period, OCM practices were required to offer four enhanced oncology services: 24/7 patient access to an appropriate clinician with real-time access to the practice's medical records, a Care Plan containing 13 elements recommended by the Institute of Medicine,[5] core functions of patient navigation, and treatment with therapies consistent with nationally recognized clinical guidelines. Participating practices may bill CMS for monthly MEOS payments in order to support development or expansion of these enhanced services, to meet individual patient needs.

Based on data from progress reports OCM practices submitted to CMS and on 12 case studies we conducted during the first year of OCM, most OCM practices offered 24/7 clinician access and followed evidence-based guidelines before OCM began. During the first year, most hired and/or trained staff to enhance patient navigation services. OCM practices struggled to create all Care Plan elements recommended by the IOM, especially estimating beneficiary out-of-pocket costs.

Quality of Care

The evaluation examined the impact of OCM on the quality of care provided to beneficiaries, to detect improvements as well as any possible reductions in quality arising from inappropriate utilization reductions. We also examined patient-reported care experiences, and use of guideline-recommended supportive care, and changes between baseline and PP1.

The OCM and comparison groups were well matched on most measures of patient-reported care experiences before OCM began, and respondents to the patient survey rated their oncology care teams very highly on most measures of care coordination, communication, access, and symptom management. Survey respondents indicated room to improve on shared decision making.

During 12 case studies, OCM practices told us they were working to improve supportive care (e.g., better nausea and pain management), with the goal of reducing ED visits and subsequent hospitalizations. However there was not yet a measurable impact of OCM on use of antiemetic (anti-nausea) therapy according to guidelines for high, moderate, or low-risk or nausea chemotherapy agents, or on reducing ED visits or hospitalizations for chemotherapy-associated complications.

OCM encourages appropriate end-of-life care and respondents to the baseline survey indicated room to improve in this regard. In PP1, there was a small impact of OCM in reducing hospital-based care near the end of life, including fewer inpatient admissions and ICU stays in the last month of life but no impact on

[5] CMS requires OCM practices to develop all 13 components of the Care Plan and to document these items in the electronic health record (EHR). CMS encourages clinicians to share a hard copy of the care plan with patients; however, this is not a requirement. The 13 components are: patient information (e.g., name, date of birth, medication list, and allergies), diagnosis, prognosis, treatment goals, initial plan for treatment and proposed duration, expected response to treatment, treatment benefits and harms, information on quality of life and a patient's likely experience with treatment, who will take responsibility for specific aspects of a patient's care, advance care plans, estimated total and out-of-pocket costs of cancer treatment, a plan for addressing a patient's psychosocial health needs, and a survivorship plan.

the rate of hospice use or timing of hospice entry. In the baseline survey, proxy respondents for deceased OCM patients were less likely to report that hospice started "at the right time" than were proxy respondents for deceased comparison patients, and there was no change over time for OCM practices on this measure.

Secondary Impacts: Other Payers' Experiences

Private payers expressed great interest in using OCM to implement or expand oncology value-based purchasing. The models they implemented aligned broadly with OCM, but differed in many details, mainly due to administrative and technical feasibility issues. In addition, most had established signed agreements with just one or two OCM practices, with small numbers of cancer patients, which made it difficult for the payers to establish stable benchmarks and measure significant change.

1. OCM Background and Evaluation Overview

1.1 OCM Background

Half of newly diagnosed cancer patients are over age 65,[6] making Medicare the single largest payer of oncology care in the U.S. CMS is operating the Oncology Care Model (OCM) to foster coordinated, high-quality, cost-effective cancer care. OCM applies to Medicare Fee-For-Service (FFS) beneficiaries with cancer who are undergoing chemotherapy treatment.[7] OCM combines attributes of medical homes[8,9] (patient-centeredness, accessibility, evidence-based guidelines,[10] and continuous monitoring for improvement opportunities) with financial incentives for providing these services efficiently, and with high quality.

OCM features a two-pronged financial incentive strategy. First, participating practices may bill Medicare a $160 Monthly Enhanced Oncology Service (MEOS) fee for up to six months per episode for FFS Medicare beneficiaries, which is intended to support enhanced oncology services, including the following:

1. 24/7 patient access to an appropriate clinician who has real-time access to the patient's medical records
2. Core functions of patient navigation
3. A documented Care Plan for every OCM patient that contains 13 components recommended by the Institute of Medicine[11]
4. Cancer treatment that is consistent with nationally recognized clinical guidelines

Second, although participating OCM practices are paid under Medicare's FFS billing rules, all Medicare-covered services that their chemotherapy patients receive are combined in six-month episodes. Participating practices may earn a PBP if they reduce Medicare episode expenditures as compared with historic benchmarks (less a discount retained by CMS). These payments are adjusted to reflect performance on several practice-reported quality measures, other quality measures derived from Medicare

---

6 National Cancer Institute website. Retrieved on April 11, 2018 from https://www.cancer.gov/about-cancer/causes-prevention/risk/age.

7 Chemotherapy is defined for OCM purposes as systemic therapies including cytotoxic chemotherapy, hormonal therapy, biologic therapy, immunotherapy, and combinations of these therapies.

8 Demartino, J. K. & Larsen, J. K. Equity in Cancer Care: Pathways, Protocols, and Guidelines. JNCCN, vol. 10, Supplement 1: S1-S9.

9 Page, R. D., Newcomer, L. N., Sprandino, J. D., et al. The Patient-Centered Medical Home in Oncology: From Concept to Reality. 2015 ASCO Educational Book. Retrieved on June 7, 2016 from http://meetinglibrary.asco.org/content/11500082-156.

10 Demartino, J.K. & Larsen, J.K. Equity in Cancer Care: Pathways, Protocols, and Guidelines. JNCCN, vol. 10, Supplement 1: S1-S9.

11 Delivering High Quality Cancer Care: Charting a New Course for a System in Crisis. Committee on Improving the Quality of Cancer Care: Addressing the Challenges of an Aging Population; Board on Health Care Services; Institute of Medicine. 2013. Retrieved on June 7, 2016 from: http://nap.edu/18359.

claims, and patient-reported ratings of care experiences measured through a survey. TCOC estimates for PP1 do not include PBPs distributed to the practices.

The five-year OCM began with six-month episodes that started on July 1, 2016; it will operate through nine consecutive semi-annual PPs, with the last six-month episodes ending on June 30, 2021. This report focuses on episodes that began during PP1: episodes that began between July 1, 2016 and January 1, 2017 and ended by June 30, 2017.

Participating OCM practices may voluntarily adopt two-sided risk, in which expenditures above the target are repaid to CMS. Accepting two-sided risk meets the Quality Payment Program's criteria for being an Advanced Alternative Payment Model. Practices will be required to move to two-sided risk (or end their participation in OCM) if, as of the initial reconciliation of the fourth PP (estimated summer 2019), they have not yet achieved a PBP at least once.

Additional details about the OCM Model and methodology are available on the CMS website.[12]

1.2 Evaluation Overview

The OCM evaluation focuses on how care delivery evolves under OCM and the contextual factors affecting Model success. The evaluation will measure impacts of the five-year OCM on characteristics of participating practices and their patients, and the impact of OCM on use of services, Medicare spending, quality of care, and patient satisfaction. The OCM evaluation is examining care provided by practices that volunteered to participate in OCM, and comparing changes over time in this group with changes in a carefully selected comparison group. This difference-in-differences (DID) design measures whether changes over the five-year demonstration period are different in the OCM intervention group than in the comparison group.

Baseline Report. As described in the *First Annual Report from the Evaluation of the Oncology Care Model: Baseline Period* (Baseline Report),[13] we used propensity score matching to select a group of oncology physician group practices. The Baseline Report demonstrates that OCM practices and selected comparison practices[14] were much alike in the baseline period (episodes that began between January 2, 2014 and July 1, 2015 and ended between July 1, 2014 and December 31, 2015), as were the beneficiaries they served and the services these beneficiaries used during their treatment episodes, which reflected national patterns on most dimensions. The similarities in the two groups, and the parallel trends demonstrated over a multi-year baseline period, enhance confidence that program impacts measured with econometric models will be a result of OCM. The Baseline Report also showed that a few very large OCM practices contributed to some baseline differences between the two groups on measures such as average practice size and average practice volume, because there are no comparably large comparison practices in the nation to include in the evaluation comparison group. In addition, the two groups differed in the baseline period in the proportion of episodes for dually eligible patients (which was lower in OCM

12 https://innovation.cms.gov/initiatives/oncology-care/.

13 https://downloads.cms.gov/files/cmmi/ocm-baselinereport.pdf.

14 Comparison practices are defined as individual tax ID numbers (TINs), as described in detail in the Baseline Report. A TIN is a billing unit, and may not perfectly map to an entire physician group practice, which can comprise multiple TINs.

practices than for comparison practices in the baseline period). Our impact analyses take these differences into account. On dozens of other practice characteristics, patient characteristics, and utilization and cost characteristics, the two groups were quite similar in the baseline period, before OCM began.

Performance Period One Report. The primary objectives of this *Evaluation of the Oncology Care Model: Performance Period One* (PP1 Report) include:

1. ***Describe how participating OCM practices are implementing Model requirements for enhanced services and using MEOS funds to improve care delivery and lower costs of care.*** We describe the OCM and comparison practices in PP1, and differential changes since the baseline period between the two groups. We also describe strategies participating oncology practices told us they employed to meet OCM requirements, and challenges that different types of practices faced as they worked to improve evidence-based care and patients' care experiences, and reduce episode costs. We further describe how participating practices are using MEOS revenue and their own resources to hire new staff, improve electronic information systems, analyze data, coordinate care, identify high-risk patients and manage their symptoms and psychosocial needs, and ensure that end-of-life (EOL) care is consistent with patient preferences. This information provides context for evaluation impact results.
2. ***Describe impacts of OCM on use of Medicare-covered services and on episode costs of care.*** Participating practices may find different ways to reduce episode costs, for example, by offering urgent care hours for symptom management (to avoid ED visits), using lower-cost but equally efficacious treatments, or discontinuing aggressive treatment at the end of life in favor of hospice or other less-intensive care. OCM encourages adherence to national oncology clinical guidelines for cancer treatment, and encourages effective management of cancer- and treatment-related symptoms. We explore early OCM impacts on many different components of utilization and cost, especially those that practices told us they were focusing on first, those that are important drivers of episode costs, and those that may indicate improved symptom management and quality of care.
3. ***Describe impacts of OCM on patient care experiences and satisfaction with cancer care.*** OCM has an explicit goal of helping patients navigate the complexities of having cancer such as treatment schedules, psychosocial impacts, side effects of treatment, depression, and out-of-pocket (OOP) cost burden. OCM also emphasizes better access for patients to their cancer care team, ongoing patient education and communication between patient and providers, and better advance care planning to ensure that providers understand each patient's goals and preferences. Improvement in these areas is expected to also improve patient-reported care experiences. We use survey data to understand the impact of OCM in these areas and whether overall satisfaction with cancer care is improving over time, both for patients who are alive at the time of the survey sampling and—as reported by family members—for those who die during or soon after their treatment episode.

To measure impacts, and the underlying changes driving these impacts, the evaluation uses data from many sources including: Medicare administrative data systems, applications completed by volunteer practices and payers, case studies and interviews, practice-reported progress in meeting OCM requirements, surveys completed by patients and family members, and clinician surveys. The evaluation also takes advantage of inputs and data from the OCM Data Registry and annual Practice Transformation Plans submitted by participants.

1.3 Organization of This Report

In Chapter 2, we describe the data and methods used in evaluation data collection and analyses. Chapter 3 presents evaluation findings for utilization, cost, practice transformation and enhanced oncology services, and quality (supportive care, EOL care, patient experiences). For each topic, we synthesize data from multiple sources to provide a multifaceted understanding of early changes and impacts of OCM. We provide a brief conclusion in Chapter 4. Throughout the report, we refer to appendices containing additional detail that may be of interest.

This report includes information about six-month episodes that began and ended during the first PP (i.e., began July 1, 2016–January 1, 2017, all of which ended by June 30, 2017). The report includes information about OCM participants and impacts in that period. It also includes surveys of patients whose episodes began and ended during the first Model year, qualitative data we collected during the first Model year, and program data reported by participants during that year. Subsequent changes in programmatic requirements, participants, and impacts will be addressed in future reports.

2. Methods

This chapter of the report describes secondary and primary data, and the methods used to analyze data and measure the impacts of OCM. In addition to analyzing Medicare claims, we surveyed patients (and family members of deceased patients) to understand care experiences. We visited 12 OCM participating practices in the first year, to understand practice transformation and changes in care delivery motivated by OCM requirements and incentives. For more detailed information about the data and methods used in this report, see Appendix A.

2.1 Secondary Data and Analytic Methods

2.1.1 Secondary Data Sources

We used several sources of data to construct the episode files used in our analyses. We used Part A and B Medicare Claims files and Part D Prescription Drug Event (PDE) files to construct measures of health care utilization and cost. In addition, we leveraged several files for beneficiary enrollment and coverage information, beneficiary characteristics, and beneficiary alignment to other CMS initiatives.

Other secondary data sources added key county-level and practice-level information. These included the CMS Health Professional Shortage Area (HPSA) files, the SK&A Office-Based Physician File,[15] academic medical school affiliation data from Welch and Bindman (2016),[16] and the Area Health Resource File (AHRF).

The full set of data sources used in the claims analyses are shown in Appendix A.

2.1.2 Secondary Data File Creation

Observation Period

OCM began July 1, 2016 and is structured with six-month episodes of care triggered by chemotherapy, for FFS Medicare beneficiaries with continuous Parts A and B enrollment. The Model is organized in semi-annual PPs, for which CMS retrospectively reconciles costs and performance for participating practices. The five-year Model test has nine PPs. The first PP includes episodes that started between July 1, 2016 and January 1, 2017, and ended between December 31, 2016 and 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.

The baseline period used in the evaluation includes six-month episodes that began January 2, 2014 through July 1, 2015 and ended by December 31, 2015. Practices submitted applications to participate in OCM in June 2015, and CMS notified practices of acceptance into the Model in April 2016. The intervention period for this report includes all episodes that occurred during the Model's first PP (PP1). We applied a "hold-out" period that did not allow episodes to begin between July 2, 2015 and June 30, 2016, so that any changes that practices began between applying to participate and before the official start of the Model did not affect the baseline period. If episodes had been defined, those that would have

[15] http://www.skainfo.com/databases/physician-data

[16] 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.

initiated in the last PP of the hold-out period were especially important to exclude, because they would have ended during the intervention period. The specific episode start and end dates that map to each PP in the baseline and intervention period are outlined in Appendix A.

Identification of Episodes and Attribution of Episodes to Practices

OCM focuses on six-month episodes of care, each triggered by a Part B claim for chemotherapy along with a relevant cancer diagnosis code, or by a Part D chemotherapy prescription filled within 59 days of or on the same day as a Part B claim with a relevant cancer diagnosis. Episodes have a fixed length of six calendar months, which can vary between 181 to 184 days depending on which calendar months are included in the episode. CMS attributes each episode to the physician practice (based on Tax ID Number, or TIN) that has the plurality of cancer-related Evaluation and Management (E&M) services during the episode.

Identification of Episodes

We identified episodes for the baseline and intervention periods on a PP basis based on the first date of chemotherapy administration or prescription fill observed in each PP, assuming it does not overlap with a prior episode. The baseline is composed of three PPs during which episodes could be triggered, and the intervention period is currently comprised of PP1 (thus far, for this report). After identifying a Part B or Part D trigger event, we examined cancer-related E&M services from the Part B carrier claims, and considered an episode to be eligible if the beneficiary had at least one cancer-related E&M service during the six months following the chemotherapy trigger event. In addition, during the entire episode, the beneficiary needed to have: continuous Medicare Parts A and B enrollment; coverage under Medicare FFS (not Medicare HMO, Medicare Advantage, or the United Mine Workers of America program); Medicare as the primary payer; and no Medicare benefit due to End-Stage Renal Disease (ESRD).

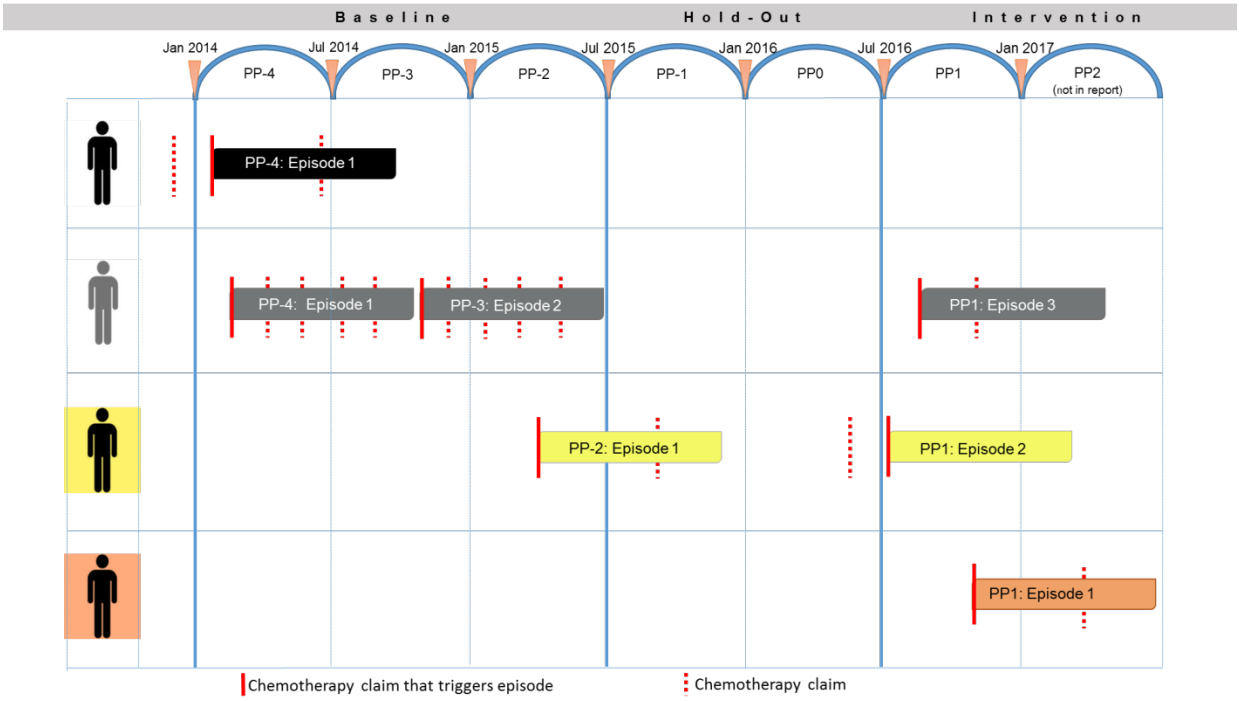
Per the OCM methodology for episode identification, we implemented the following:

- All Part A, B, and D claims that occurred during the six-month period following a triggering claim were included as part of the episode.
- If a beneficiary had a subsequent qualifying chemotherapy claim that did not overlap with the prior episode, that claim would trigger a new episode (if the episode met the eligibility criteria specified above).
- A chemotherapy-free period was not required between one episode and the next, but a subsequent episode did not trigger until the prior episode (i.e., six months) ended.
- An episode could only end earlier than six months if the beneficiary died.

Episodes were identified for the baseline and intervention periods independently, with the identification process restarted for the intervention period. **Exhibit 1** illustrates several important features of episode identification. First, episodes were assigned to a period based on the baseline PP (denoted by a negative PP to indicate it is a pre-performance period) or intervention PP in which they began, and there was a hold-out period between the baseline and intervention periods. For this reason, as shown by *PP-2:Episode 1* in the third row of the exhibit, an episode that triggered in the last (third) PP of the baseline period was included as a baseline episode, even though the episode concluded during the hold-out period. Second, a beneficiary can have more than one episode, and those episodes may exist during the baseline period, the intervention period, or both time periods. For example, in the second row of the exhibit, the beneficiary

had three episodes, two episodes in the baseline period (*PP-4:Episode 1* and *PP-3:Episode 2*) and one episode in the intervention period (*PP1:Episode 3*). Third, once an episode begins, subsequent claims for chemotherapy do not trigger a new episode until after the six-month episode ends (as shown in *PP-4:Episode 1* and *PP-3:Episode 2* in the second row).

Exhibit 1: Identification of Episodes



Source: Figure produced by report authors.
Notes: PP-4 through PP-2 refer to the three PPs in the baseline period, PP-1 through PP0 refer to the two PPs in the hold-out period, and PP1 refers to the first PP of the intervention period. Episodes that start in PP2 will be included in the intervention period in subsequent reports.

As **Exhibit 1** demonstrates, the episode identification algorithm yields a different mix of episodes in the first PP of both the baseline and the intervention than in subsequent periods. Because the OCM methodology does not require an initial chemotherapy-free period, a beneficiary's first eligible chemotherapy claim in the first PP of the baseline period, or in the first PP of the intervention period, triggered an episode—even when the beneficiary had a chemotherapy claim within the prior six months. (For example, *PP-4:Episode 1* for the beneficiary in the first row and *PP1:Episode 2* for the beneficiary in the third row of the exhibit both do not include claims that occur outside the OCM time periods.) As a result, the first baseline PP included a higher proportion of beneficiaries with ongoing chemotherapy (prevalent cases) than new chemotherapy (incident cases). In subsequent baseline PPs, new episodes were identified if there was no trigger in the prior PP or if a previous episode had ended and a new trigger occurred, and this yielded a clearer distinction between prevalent and incident cases[17]. The number of

[17] A prevalent case reflects an episode for which a beneficiary has been receiving on-going chemotherapy treatment prior to the start of the episode. An incident case reflects an episode for which a beneficiary has newly begun chemotherapy treatment at the start of the episode.

episodes identified in the first baseline PP was higher than the number of episodes identified in the subsequent baseline PPs. The same is true for the intervention period (i.e., more episodes, and more prevalent cases, in PP1 than in subsequent periods).

Another artifact of the episode attribution algorithm pertains to long-term hormonal therapies (e.g., a patient taking a daily tamoxifen pill after breast cancer surgery). Some beneficiaries on long-term hormonal therapies have infrequent cancer E&M services, as few as one or two office visits each year. Because the OCM methodology requires a cancer E&M service to identify an episode, and defines episodes as six months in duration, beneficiaries whose cancer E&M services take place more than six months apart may not trigger consecutive episodes even if they are on continuous treatment. This results in beneficiaries who were actually in ongoing (prevalent) chemotherapy treatment in the first PP not being identified as having episodes until the next PP, due simply to the timing of their E&M services. This may lead to an understatement of the beneficiaries whose care is being overseen by the practice at any point in time. This artifact of episode triggering will gradually moderate, as prevalent users of long-term hormonal therapy return for cancer E&M visits on schedules that even out over the months of the year.

Section 3.1.1 provides more information about the number and characteristics of episodes identified in the baseline and intervention periods.

Episode Attribution

Per the OCM attribution methodology, we assigned all eligible episodes to the practice that provided the plurality of cancer-related E&M services during the episode. A practice is defined as the TIN listed on the E&M claim. A TIN is a billing unit, and it may or may not represent the structure of a physician group practice; some oncology practices use multiple TINs, and some oncology practices share a single TIN with a larger multi-specialty organization. For OCM, CMS requires that participating practices each use a single TIN, and that all OCM practitioners in the practice submit claims under that TIN. Participating OCM practices that experienced billing or business changes during the baseline or intervention period provided CMS with any "legacy" (i.e., older) TINs, which were replaced by the active TIN used for OCM participation, and we used these legacy TINs to attribute episodes to OCM practices in the baseline period. Because legacy TINs were not available for practices not participating in OCM, we were unable to track TIN changes for these practices and instead attributed episodes to individual TINs.

Comparison Group Selection

We selected a comparison group of practices using propensity score matching (PSM). The objective of PSM is to identify a comparison group that is statistically similar to the treatment group, based on observable factors. We chose a subset of non-participant practices that are relevant for OCM, taking into consideration (a) patterns of billing cancer-related E&Ms for chemotherapy patients, (b) eligibility to participate in OCM based on Model rules, and (c) similarity to OCM practices in terms of key characteristics.

The propensity score is defined as the probability of participating in OCM, conditional on a set of observed characteristics. PSM aims to balance the distributions of important characteristics between the OCM group 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 characteristics to compute a single score, it balances the treatment and comparison groups on a large

number of factors, without eliminating comparators that may be good matches (i.e., similar) on average, to OCM practices.

PSM yielded strong evidence that the selected comparison group of 539 practices is statistically similar to the group of OCM practices overall, and on most key characteristics. More information about the comparison group selection is provided in Appendix A in this report and in the Baseline Report.[18]

2.1.3 Secondary Data Analyses

OCM practices that withdrew from the Model before the end of PP1 were retained in the analysis, because we are using an Intent-to-Treat evaluation approach. This is necessary to avoid measuring impact only for those that successfully implement the Model, and also because some practice transformation may continue after withdrawal (e.g., improved patient education materials, improved phone triage processes) with potential ongoing impacts.

Claims-Based Outcome Measures

We compared health care utilization and costs, as well as end-of-life (EOL) care quality, for the OCM and comparison samples during the baseline and intervention periods. All outcome measures are calculated at the episode level, not the practice/TIN level. Findings with $p<0.10$ are considered statistically significant.

The utilization measures presented in this report address inpatient care, emergency department (ED) visits, Part A post-acute services (e.g., skilled nursing facility and home health agency services), selected Part B outpatient services (e.g., imaging and radiation therapy services), and Part B and D chemotherapy and drug fills. We also measure ED visits and inpatient hospitalizations due to complications from chemotherapy. We constructed utilization process and outcome measures of EOL and hospice care, in three domains: hospital-based care and chemotherapy at the end of life, hospice use and timing, and place of death. (See Appendix A for measure specifications.)

Cost measures include total cost of care (TCOC), comprised of Part A, Part B, and Part D costs. In addition, we report Part A costs for inpatient care and post-acute and long-term care, institutional and non-institutional Part B costs, and Part B and D costs for cancer-related services and drugs. We also present total beneficiary deductible and coinsurance costs for Parts A, B, and D.

The costs we report throughout this report reflect Medicare payments. The reported Part A and B costs are based on standardized payments, which exclude geographic differences in labor costs and practice expenses and also remove payment variation resulting from other CMS program reductions/additions (e.g., for programs including bundled payment). The reported Part D costs are not standardized and include low-income cost-sharing and reinsurance payments. Calculated costs do not include MEOS bills submitted by OCM practices because full MEOS billing data for PP1 were not available in time for inclusion in this report.

Descriptive and DID Impact Analyses

For this PP1 Report, we compared OCM and comparison practices on a number of episode- and practice-level characteristics. We used DID regression analyses to estimate the impact of OCM on utilization, cost, supportive therapy, and EOL quality, controlling for other factors unrelated to OCM that could influence outcomes. DID is a statistical technique that compares changes in an outcome for the OCM group with

[18] https://downloads.cms.gov/files/cmmi/ocm-baselinereport.pdf

changes in that outcome for the comparison group, from the baseline period before OCM began, to the implementation period (after July 1, 2016). The DID models used in this report estimate the average impact of OCM on an outcome of interest, over the duration of the intervention period thus far, PP1.

For a subset of key outcomes, we estimated impacts for core cancer subgroups where there appeared to be differences, and for which we had adequate statistical power (i.e., sufficient episode volume) in PP1 to detect meaningful differences. The first set of subgroup analyses focused on the 10 most prevalent cancer bundles. We derived episode cancer bundles based on the cancer types assigned to each episode (see Appendix A for details). A separate set of subgroups were defined according to episodes for low-risk and high-risk cancer bundles. Low-risk cancer bundles were composed of breast cancer episodes using only hormonal therapies, and prostate and bladder cancer episodes using only low-risk chemotherapy regimens. Appendix A contains more information about the statistical methods used.

Probability Estimation

In addition to the DID impact analyses, we estimated the *probability* of OCM impacts (e.g., the probability of reduced costs or utilization under OCM) for four key outcomes, specifically: (1) the number of inpatient stays, (2) the number of ED visits not resulting in an inpatient stay, (3) the number of ED visits resulting in an inpatient stay, and (4) total costs of care per episode. These measures were selected because of their relevance to the cost and quality goals of OCM and to the OCM PBP methodology. In addition, the utilization measures may be important early indicators of the potential impacts of enhanced services under OCM.

More information about the estimation methodology is shown in Appendix A.

2.1.4 Clinical Analyses

Guideline-Recommended Use of Prophylactic Antiemetics during Intravenous Chemotherapy

Many patients undergoing chemotherapy experience nausea, and antiemetic therapy is an important element of supportive care. The incentive to deliver high-value care under OCM could lead practices to systematically reduce overuse of costly antiemetic (anti-nausea) drugs, in situations where similarly effective and less expensive alternatives are available. Conversely, the incentive to prevent ED visits and costly hospitalizations could lead practices to adopt more high-intensity antiemetic regimens, with the goal of reducing use of acute care. We therefore studied the use of guideline-recommended prophylactic antiemetic supportive therapy, and also the use of high-intensity antiemetics in situations where less potent and costly options might suffice. Specifically, we used national guidelines for supportive therapy from the National Comprehensive Cancer Network (NCCN) and the American Society of Clinical Oncology (ASCO), and identified patients starting intravenous chemotherapy regimens, stratified by the emetogenicity risk of the chemotherapy regimen (high, moderate, or low risk of causing nausea and vomiting). These guidelines specify drugs that should be used prophylactically—before chemotherapy infusions—to prevent nausea. We defined prophylactic antiemetic supportive therapy as prescription or in-office administration of guideline-recommended antiemetic drugs within 14 days before through one day after the first chemotherapy infusion. Criteria for identifying guideline-recommended antiemetic regimens are shown in Appendix A. We considered any use of potent antiemetics for patients receiving only low-risk chemotherapy agents to be non-guideline care.

In addition to assessing guideline-recommended antiemetic use, we evaluated “high-intensity” patterns of guideline-recommended antiemetic use among patients receiving chemotherapy with moderate and low emetogenic risk. For example, use of a 5-HT3 receptor antagonist with or without an NK1 receptor

antagonist is guideline-recommended antiemetic prophylaxis for moderate emetogenic risk chemotherapy. We classified combination antiemetic treatment with both a 5-HT3 receptor antagonist and an NK1 receptor antagonist as high-intensity. Analyses of "high-intensity" drug use assess whether OCM influenced patterns of antiemetic use for patients already receiving guideline-recommended antiemetic therapy.

Hospitalizations and ED Visits for Patients Undergoing Chemotherapy

We adapted a CMS measure originally developed to assess hospitalizations and ED visits for patients undergoing chemotherapy in hospital-based outpatient departments.[19] We examined chemotherapy episodes in OCM comparison practices that included at least one chemotherapy-associated hospitalization or ED visit.

In Appendix F, we also separately report ED visits that do, and those that do not, result in an inpatient stay.

While there are some limitations of these measures, all of these limitations apply equally to OCM and comparison practices, and in both the baseline and intervention periods; we do not expect them to differentially influence our DID estimates of OCM impact. Rather, these issues help to inform interpretation of the findings and of differences between findings for this measure and other measures of inpatient and ED use.

2.1.5 Practice Transformation Plans

CMS asks participating OCM practices to submit annual Practice Transformation Plans (PTPs). These are structured self-assessments of their practice transformation activities during the prior year, and their plans for the future. The reporting template contains primarily close-ended questions covering several domains.[20] OCM practices have submitted two PTPs to date, early in Model Year One (Fall 2016) and early in Year Two (Fall 2017). This report focuses on PTP responses provided in Fall 2017, because the Fall 2016 PTPs reflected only three months of OCM activity. We coded PTP responses into binary measures reflecting consistent use of care processes. Descriptive analyses explored the percentage of OCM practices using a given approach or care process, and bivariate analyses stratified PTP measures by practice characteristics and compared changes in PTP reports between 2016 and 2017. Appendix A shows how analytic measures are defined, and Appendix E includes all results from these analyses.

---

[19] Mathematica Policy Research. Admissions and Emergency Department Visits for Patients Receiving Outpatient Chemotherapy Measure Technical Report. Prepared for Centers for Medicare & Medicaid Services; March 2016. Available from: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html.

[20] The 2017 PTPs included the following domains: Respondent information; Access and continuity; Care coordination; Care planning and management; Patient and caregiver engagement; Team-based care; Data-driven quality improvement; Evidence-based medicine; Strategic plan; and Practice redesign priorities for the next 6 to 12 months.

2.2 Primary Data Collection and Analysis

2.2.1 Patient Survey

This report compares survey responses from OCM and comparison patients receiving cancer care just as OCM began (April through September 2016); for the purposes of the survey, we consider this survey wave to be the baseline. This report also presents trends in the OCM group from the baseline through intervention survey wave 1 (July through December 2016), intervention survey wave 2 (October 2016 through March 2017), and intervention survey wave 3 (January through June, 2017). The surveys are administered by mail.

Survey Data Collection

The OCM patient survey measures perspectives about a number of cancer care experiences. We designed and administered three distinct survey instruments:

1. The **main** questionnaire is sent to cancer patients we believe to be alive at the time of survey mailing. It contains questions about care experiences and current health status, but does not ask about EOL care because these patients are (to the best of our knowledge) alive.
2. A tailored **alternative** questionnaire is sent to the family proxies of cancer patients who had died by the time the survey was mailed (i.e., died during or soon after their six-month care episode). It asks the same care experience questions as the main survey, and also asks about EOL care, but it does not ask about current health status (because patients are deceased).
3. A **decedent** questionnaire is sent to the family proxies of patients who were alive for the initial survey mailing (whether or not they responded), but who died during the subsequent year. It asks about EOL care.

Appendix A contains more details about the differences between these three instruments. These three instruments and populations together offer a complete picture of care and satisfaction as experienced by patients who survive, those who die during or soon after their six-month treatment episodes, and those who die months later.

Both the main and alternative questionnaires are based on a questionnaire that was developed and tested in the first Consumer Assessment of Healthcare Providers and Systems (CAHPS) for Cancer Care chemotherapy (drug therapy) module, with additional insight from its use in a National Committee for Quality Assurance study.[21] We revised the instrument to address all types of cancer treatment included in OCM (chemotherapy, immunotherapy, and hormonal therapy). We also augmented the instrument to add items that are of interest to OCM, including presence of treatment-related symptoms (e.g., nausea, neutropenia, constipation) and management of these symptoms, quality of life, health status, understanding of the purpose of treatment, and (for the alternative and decedent questionnaires) EOL care. The three patient survey instruments are included in Appendix G of this report.

The evaluation uses a baseline survey wave timed just as OCM began, followed by 19 quarterly intervention-period survey waves. In each survey wave we send the main survey to sampled patients we

[21] The final version of CancerCAHPS was not available in time for our baseline survey, and we wanted to use the same questionnaire for the baseline and subsequent survey waves, to ensure comparability.

believe to still be alive, and the alternative survey to family members (proxies) of sampled patients we believe are deceased. Three survey waves include a parallel sample of matched comparison group patients: the baseline survey (episodes starting April through September 2016), intervention survey wave 9 (episodes starting July through December 2018), and intervention survey wave 19 (episodes starting January through June 2021). Two waves include the decedent survey: baseline and intervention survey wave 9.

In each survey wave we sample patients who received chemotherapy[22] in the previous six months, and assign each to the TIN that billed the most E&M visits between the episode triggering date and the date we draw the sample.[23] We do not select the same patient more than once in a year, even from the smaller practices, to reduce respondent burden. In survey waves that include a sample of comparison patients, we select comparison patients by matching to OCM patients on selected beneficiary and practice characteristics.

The baseline wave was the first of three survey waves for which we will sample both OCM and comparison beneficiaries. We selected beneficiaries who received chemotherapy in April through September 2016, which we consider the baseline for the survey.[24]

Appendix A shows the starting sample size and response rate for each survey wave. Response rates in each wave were higher for the main survey than for the alternative survey or the decedent survey. For example, the response rate among OCM patients in the baseline wave was 48.3 percent for the main survey, 39.0 percent for the (proxy) alternative survey, and 40.9 percent for the (proxy) decedent survey, and response rates were similar for the comparison sample. Response rates for the OCM sample declined slightly in each subsequent wave for the main and alternative surveys, possibly related to the changing composition of the survey sample (i.e., different mix of cancer types in each survey wave).

Survey Outcome Measures

In each wave of survey analysis, we calculate six patient experience composite scores, as follows: Access (six survey questions), Affective Communication (four questions), Enabling Patient Self-Management (eight questions), Exchanging Information (four questions), Shared Decision Making (four questions),

[22] Chemotherapy is defined for OCM and for the patient survey as chemotherapy, immunotherapy, and/or hormonal therapy.

[23] We draw a new survey sample every quarter, looking back six months for a trigger drug event. For most in the sample we therefore do not have a full six months of claims, and cannot attribute an episode to a TIN using the full six months of E&M visits. Waiting for six months of post-trigger claims to accumulate would delay the survey and increase the potential for recall bias.

[24] 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.

and Symptom Management (eight questions).[25] In addition, there is a single survey question that asks patients for their overall rating of their cancer therapy team. Appendix A describes the component questions for each composite.

Each composite score is calculated as the average score across all component questions within a composite, with each non-missing question assigned an equal weight. All composite scores and the overall rating range from 0 (worst experience possible) to 10 (best experience possible). We also analyzed selected individual survey questions, including the individual questions that comprise the composites, and other questions that are not grouped into a composite.[26]

Survey Analytic Methods

For this report we conducted two survey analyses. The first analysis compares care experiences reported by OCM respondents with those reported by a matched sample of comparison respondents, at baseline (April through September 2016). That baseline survey wave used both the main and alternative surveys, and also the decedent survey, for OCM and comparison respondents. The second analysis examines trends in care experiences reported by OCM respondents from the baseline wave through intervention survey wave 3 (January through June 2017). (We have not yet collected data from a comparison sample in the intervention period, and have not yet repeated the decedent survey in the intervention period).

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 samples at baseline.[27] For the trend analysis of EOL care (OCM group only), we used the alternative survey for EOL care measures, because the baseline decedent survey has not yet been repeated.

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 OOP expenses related to cancer care in six expense categories, and we used an ordered logit regression to estimate the risk-adjusted share of respondents reporting each expense

---

[25] The enabling patient self-management composite includes three questions about whether care providers talked with the patient about three cancer-related symptoms: pain, change in energy level, and emotional problems. It also includes questions about whether care providers helped patients deal with these symptoms (if patients did experience them), as well as two questions about additional services to help patients manage care and maintain health at home. The symptom management composite includes eight questions about whether care providers helped patients deal with symptoms: one for each of the eight symptoms, including the three symptoms in the enabling patient self-management composite and five additional symptoms. Thus, three of the symptom management questions are repeated in both of these composites.

[26] For each individual question, we created a dichotomous variable that takes a value of 1 for the most positive response and 0 otherwise. For example, responses of "Always" to the question asking "How often tests and procedures were done as soon as you needed?" are assigned a value of 1, and any other answer to that question is assigned a value of 0.

[27] 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.

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.

For all survey analyses, we included both patient and practice characteristics in risk adjustment for composite scores and for individual questions, to control for differences that may be unrelated to OCM. In addition to analyzing all respondents as a group, we estimated the risk-adjusted survey results for key patient subgroups.

2.2.2 Year One Case Studies

Data Collection

We conducted 12 in-person case studies with participating practices during Model Year One, one each month starting in July 2016. We selected practices with a range of different attributes including size, ownership, geographic location, and pre-OCM average per beneficiary cost of care. We initially developed and continuously updated both the interview protocols and the codebook based on the findings from case studies. Depending on the practice size and other characteristics, interviewees for each case study included:

- Clinical and administrative leaders
- Medical oncologists and specialty oncologists
- Palliative medicine specialists
- Physician assistants and nurse practitioners
- Nurses
- Patient navigators and care coordinators
- Medical assistants
- Business/finance directors
- Patient financial advocates/counselors
- Directors of performance improvement
- IT staff (e.g., electronic health records)
- Pharmacists
- Staff involved in data management and analytics

Exhibit 2 shows characteristics of the 12 OCM practices we visited during Year One.

Cross-Case Analysis

After each case study visit, the team coded themes using NVivo software and updated the codebook to include new themes as appropriate. We identified themes found in at least two of the 12 case studies, and important insights that emerged from one case study in contrast with the others.

In reporting the findings from the cross-case analysis, we note practice characteristics that appear to be associated with an observed theme, where applicable. Specifically, we looked for differences that may be related to practice size or ownership (independent versus health system-owned). We also categorized case study themes based on whether we visited early in the first OCM Model year (between July and December 2016) or later in the year (January through May 2017). Since this qualitative analysis includes only 12 case studies, we cannot examine differences by multiple characteristics at the same time. As with other findings in this report, we caution that case study material reflects early Model experience, during the first year of OCM implementation.

Exhibit 2: Characteristics of 12 Year One Case Study Practices

Practice	Location	Ownership	Size*	Oncology Only or Multi-Specialty	Baseline Episode Average Monthly Cost [28] (as Compared with National Averages)	Time of Site Visit
Year 1A	Northeast	Health system-owned	Large	Multispecialty	Average	Jul.–Dec. 2016 (early case studies)
Year 1B	Midwest	Health system-owned	Very large	Multispecialty	High	
Year 1C	South	Independent	Medium	Oncology only	Average	
Year 1D	West	Independent	Medium	Oncology only	Low	
Year 1E	Mid-Atlantic	Independent	Small	Oncology only	Average	
Year 1F	Southwest	Independent	Medium	Oncology only	High	Jan.–May 2017 (later case studies)
Year 1G	West	Health system-owned	Small	Oncology only	Low	
Year 1H	Midwest	Independent	Medium	Oncology only	Low	
Year 1I	Mid-Atlantic	Health system-owned	Medium	Multispecialty	Average	
Year 1J	Southeast	Independent	Very large	Oncology only	Average	
Year 1K	West	Independent	Very large	Oncology only	Average	
Year 1L	South	Independent	Small	Oncology only	Low	

* Practice size categories: small=fewer than 12 medical oncologists; medium=between 12 and 24 medical oncologists; large=between 25 and 49 medical oncologists; very large=50 or more medical oncologists.

2.2.3 Other Payer Interviews and Exit Interviews

During 2016, 17 payers signed an OCM Memorandum of Understanding (MOUs) with CMS to implement oncology alternative payment models aligned with OCM, and try to enroll OCM practices with which the payers have contracts. One payer terminated shortly after the Model began. We reviewed the applications and implementation updates from the 16 remaining payers, and interviewed them in January and February 2017 by telephone. Descriptive analysis explored payment model features and alignment with OCM features, practices participating in these payers' models, and payer implementation successes and challenges.

Throughout the course of Year One, eight practices withdrew from OCM. We used a structured interview guide to interview representatives from practices that withdrew from the OCM, to understand reasons for withdrawing and perspectives about the value of their abbreviated participation.

[28] The OCM Implementation and Monitoring contractor developed preliminary Medicare beneficiary/month cost averages in the baseline period. We used these averages to categorize each practice's Medicare costs as being close to the national average of all practices (OCM and others), below the national average, or above the national average.

3. Findings

Chapter 3 contains detailed findings from multiple data sources, organized by domain. Section 3.1 describes early changes in the characteristics of participating OCM practices, the patients they served, and the episodes of care they provided. Section 3.2 presents results about the impact of OCM on utilization of Medicare-covered services. Section 3.3 presents results about the impact of OCM on episode costs, and 3.4 shows the probability of various levels of cost savings to Medicare. Section 3.5 addresses practices' efforts to offer enhanced oncology services, and Section 3.6 presents findings about quality of care. Section 3.7 contains information about the experience of other payers who agreed to align their oncology alternative payment models with OCM. Each section begins with a summary of key findings.

3.1 Changes in Episode and Practice Characteristics

Summary of Findings on Changes in Episode and Practice Characteristics, Between Baseline and Intervention Periods

OCM practices and comparison practices were well matched in the baseline period, and there was little change in the types of beneficiaries served or the type and severity of cancer episodes in PP1. It is important to monitor practice characteristics and case mix to understand any potential impacts of OCM program incentives.

- The proportion of both OCM practices and comparison practices affiliated with hospitals or health systems increased between the baseline and intervention periods, and both OCM and comparison practices increased in size.
- There was an increase in the share of providers who were nurse practitioners and physician assistants, for both OCM practices and comparison practices.
- Per episode Part D chemotherapy use increased among OCM and comparison beneficiaries who were enrolled in Part D.
- Use of immunotherapies corresponded to the U.S. Food and Drug Administration (FDA) approval of drugs and indicated uses.
    - In the baseline period, few immunotherapies had been approved, and immunotherapies were used in less than one percent of OCM episodes. Immunotherapy use increased similarly for both OCM and comparison episodes in the intervention period.

In the Baseline Report,[29] we described the characteristics of OCM practices prior to the implementation of the model, and compared their attributes to those of the Taxpayer Identification Numbers (TINs) selected for the evaluation comparison group. Overall, comparison practices were similar to OCM practices across most episode and practice characteristics. Comparison practices, however, were smaller than OCM practices on average, with respect to the number of attributed episodes, number of oncologists, and number of practice sites. With data from PP1, we explored whether OCM or comparison practices have changed since the baseline in terms of key episode and practice characteristics such as cancer mix, beneficiary demographics, practice size, and organizational structure. Changes in practice and episode attributes over time can influence treatments, outcomes, and costs. Understanding these changes provides

[29] https://downloads.cms.gov/files/cmmi/ocm-baselinereport.pdf.

context for the impact findings described later in this report. Moreover, if OCM practices are changing their mix of beneficiaries or organizational structure in response to OCM Model incentives, the types and magnitude of changes is important to understand as these may affect decisions about scalability of the Model.

3.1.1 Changes in Beneficiary and Episode Characteristics from Baseline to Intervention Periods

We examined how cancer bundle mix, beneficiary demographics and risk, and the use of Part D chemotherapy, immunotherapy and novel therapy changed among OCM and comparison episodes, between the baseline and the intervention periods, because these changes can influence episode-level outcomes and cost. As noted in Chapter 2, the intervention period covered in this report was comprised of six-month episodes that began during the PP1 of OCM (July 1, 2016 to January 1, 2017), while the baseline period was comprised of six-month episodes that began between January 2, 2014 and July 1, 2015.

Episode Attribution Algorithm

As described in Section 2.1.2, the OCM algorithm that identifies and attributes episodes yielded a different mix of episodes in the first PP of the baseline period and the first PP of the intervention period, than in subsequent PPs, yielding a larger proportion of prevalent cases with on-going chemotherapy. However, the episode algorithm impacts the first PP data for both OCM and comparison episodes equally; we therefore believe the DID impact estimates presented in this report are not affected. While we anticipate the algorithm's effect will diminish in future PPs, it is important to account for these measurement issues when interpreting trends, especially early in the Model.

Cancer Bundle Mix

We examined changes in the cancer bundle mix between the baseline and intervention periods (**Exhibit 3**), because changes in the cancer bundle mix will affect average episode cost. For both the baseline and intervention periods, the volume of episodes varied considerably by cancer bundle, indicating that aggregate outcome measures of cost and utilization are heavily influenced by specific cancer bundles.

- Hormonal only and non-hormonal breast cancer represented the largest share of episodes, comprising 35 percent of OCM and comparison episodes followed by low-risk and high-risk prostate cancer (12 percent) and lung cancer (9 percent).
- Liver cancer, malignant melanoma, low-risk bladder cancer, central nervous system (CNS) tumors, acute leukemia, and anal cancer together represented five percent of all OCM and comparison episodes.

Exhibit 3: Cancer Bundle Mix among OCM and Comparison Episodes from Baseline to Intervention (PP1)

Cancer Bundle	Baseline Period Episodes Initiating: (1/2/14-7/1/15)		Cumulative 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
	%	%	%	%
Hormonal Only Breast Cancer	23.6%	23.2%	24.8%*	23.5%*
Non-Hormonal Only Breast Cancer	10.6%	9.5%	10.1%*	9.2%*
Lung Cancer	9.6%	9.0%	9.5%	9.2%*
Low-Risk Prostate Cancer	8.0%	11.2%	8.1%*	10.8%*
Lymphoma	7.0%	6.1%	6.5%*	5.7%*
Colorectal/Small Intestine Cancer	6.4%	6.0%	5.6%*	5.4%*
Multiple Myeloma	5.4%	5.0%	5.6%*	5.2%*
Non-Reconciliation Eligible Cancer[30]	3.9%	4.5%	4.6%*	5.5%*
Chronic Leukemia	3.5%	3.5%	3.5%	3.4%
High-Risk Prostate Cancer	3.6%	3.8%	3.5%	3.6%*
Pancreatic Cancer	2.3%	2.2%	2.2%	2.3%
Ovarian Cancer	2.2%	2.3%	1.9%*	2.0%*
Gastro/Esophageal Cancer	1.7%	1.6%	1.5%*	1.6%
Endocrine Tumor	1.3%	1.1%	1.5%*	1.4%*
Myelodysplastic Syndrome (MDS)	1.7%	1.4%	1.5%*	1.3%*
Head and Neck Cancer	1.5%	1.4%	1.4%	1.3%*
Female GU Cancer Other Than Ovary	1.3%	1.4%	1.4%*	1.5%*
High-Risk Bladder Cancer	1.4%	1.3%	1.2%*	1.2%*
Kidney Cancer	0.8%	0.9%	1.1%*	1.1%*
Liver Cancer	1.0%	1.0%	1.0%	1.1%
Malignant Melanoma	0.6%	0.6%	0.9%*	0.9%*
Low-Risk Bladder Cancer	0.7%	1.3%	0.7%	1.2%*
Central Nervous System (CNS) Tumor	0.8%	0.7%	0.7%*	0.7%*
Acute Leukemia	0.7%	0.6%	0.7%	0.7%*
Anal Cancer	0.3%	0.3%	0.3%	0.3%

Source: Episode analytic files, 2014–2017.
Notes: * Denotes a statistically significant difference from baseline estimates to intervention estimates at p≤0.10. Due to the precision of the values reported, some results that are statistically significantly different may appear to be identical; however, they are different when including more precision on the point estimate.
OCM: OCM intervention group; COMP: Comparison group.

Beneficiary Characteristics

The characteristics (i.e., gender, age, race/ethnicity, Medicaid dual status) of beneficiaries with attributed episodes changed very little from the baseline to the intervention period for both OCM and comparison episodes (see Appendix B).

Part D Chemotherapy Use

The proportion of episodes triggered by a Part D chemotherapy drug (i.e., prescribed oral therapy rather than infused chemotherapy) increased between the baseline and intervention periods for both OCM and

[30] The non-reconciliation eligible cancer bundle comprises a set of cancer types identified by CMS to be very rare with small samples sizes. As a result, episodes assigned with these cancer types are not eligible for CMS's performance based payment, although are eligible to receive MEOS payments.

comparison episodes (see Appendix B). While there were underlying changes occurring in the availability and use of chemotherapy drugs, OCM practices were not appreciably different from comparisons in this dimension. This is important to continue monitoring as OCM and comparisons may differ in terms of substitution from Part B infused chemotherapy to oral Part D chemotherapy, or in the uptake of Part D novel therapies.

The proportion of OCM episodes triggered by a Part D chemotherapy drug increased slightly from 38.5 percent in the baseline period to 41.6 percent in the intervention period (see Appendix B). The proportion of comparison episodes triggered by a Part D chemotherapy drug increased similarly.

We examined Part D chemotherapy use for the subset of beneficiaries who were enrolled in Part D throughout all months of the episode (while alive).

- Part D chemotherapy drug use during episodes increased from 55.4 percent in the baseline period to 57.3 percent in the intervention period for OCM episodes.
- The proportion of comparison episodes with Part D chemotherapy drugs also increased, from 55.6 percent in the baseline period to 56.5 percent in the intervention period.

There was an increase in use of Part D chemotherapy for the majority of cancer bundles between baseline and intervention periods (**Exhibit 4**). The largest increases were for breast cancer episodes (nine percentage point increase) where treatment involves more than hormonal therapy only (driven by increasing use of palbociclib—a Part D medication—in this patient population), and for chronic leukemia episodes (eight percentage point increases). In contrast, Part D chemotherapy use decreased in both OCM and comparison episodes in kidney cancer, malignant melanoma, and high-risk prostate cancer. Decreases in use of Part D chemotherapy for these cancers is consistent with publicized changes in cancer treatment (e.g., increasing use of intravenous immunotherapies for treatment of kidney cancer and melanoma, substituting for Part D oral therapies).

Immunotherapy Use

As of PP1, there is no differential use of immunotherapy between OCM and comparison practices. Understanding immunotherapy use among OCM episodes relative to comparison episodes is important because OCM practices may be incentivized to use costly immunotherapies at different rates than their comparison counterparts.[31] The National Cancer Institute defines immunotherapy as: "A type of therapy that uses substances to stimulate or suppress the immune system to help the body fight cancer, infection, and other diseases. Some types of immunotherapy only target certain cells of the immune system. Others affect the immune system in a general way. Types of immunotherapy include cytokines, vaccines, bacillus Calmette-Guerin (BCG), and some monoclonal antibodies."[32] In this report, the term "immunotherapy" generally refers to the new class of monoclonal antibody therapies that includes nivolumab and pembrolizumab, among other agents. These therapies are typically very expensive, sometimes exceeding $100,000 in per-episode costs, which heavily influences the total episode cost of

[31] Since immunotherapies were not widely available in the baseline period, it is difficult to assess changes in immunotherapy utilization within a DID framework. We therefore examine descriptive changes in immunotherapy use in this report.

[32] National Cancer Institute. NCI dictionary of cancer terms [homepage on the internet]. Posted May 15, 2015. Available from https://www.cancer.gov/publications/dictionaries/cancer-terms/def/immunotherapy.

care. Few immunotherapies were approved by the FDA during the OCM baseline period (i.e., before July 1, 2016), but the pace of FDA approvals is accelerating during the OCM intervention period. While OCM provides a novel therapies adjustment, it also incentivizes use of lower-cost treatments, which could impact adoption and use of immunotherapies. We therefore reviewed the availability and uptake of immunotherapies from the baseline period to intervention period, in the OCM and comparison groups.

Exhibit 4: Part D Chemotherapy Utilization among OCM and Comparison Episodes from Baseline to Intervention, by Cancer Bundle

Cancer Bundle	Baseline Period Episodes Initiating: (1/2/14-7/1/15)				Intervention Period Episodes Initiating: (7/1/16-1/1/17)			
	OCM N= 278,676		COMP N = 335,421		OCM N = 115,294		COMP N = 136,081	
	N	%	N	%	N	%	N	%
Hormonal Only Breast Cancer	82,407	100.0%	95,990	100.0%	34,656	100.0%	38,387	100.0%
Non-Hormonal Only Breast Cancer	27,855	45.4%	30,646	47.2%	11,155	54.6%*	12,173	55.5%*
Lung Cancer	24,118	22.5%	27,831	23.5%	9,931	19.0%*	11,526	20.9%*
Low-Risk Prostate Cancer	17,152	40.1%	29,651	38.0%	7,427	37.7%*	11,856	36.6%*
Lymphoma	17,138	16.3%	18,116	17.5%	6,695	20.7%*	7,110	22.3%*
Colorectal/Small Intestine Cancer	15,856	11.1%	18,269	11.8%	5,741	11.3%	6,601	11.4%
Multiple Myeloma	15,616	69.7%	17,355	71.2%	6,619	74.3%*	7,293	76.3%*
Non-Reconciliation Eligible Cancer	10,810	49.8%	14,881	49.8%	5,317	52.0%*	7,466	53.2%*
Chronic Leukemia	10,705	74.9%	12,549	76.6%	4,520	82.8%*	5,129	84.2%*
High-Risk Prostate Cancer	10,622	83.7%	13,681	84.2%	4,198	78.9%*	5,156	78.7%*
Pancreatic Cancer	5,657	6.2%	6,744	6.3%	2,258	5.5%	2,833	5.0%*
Ovarian Cancer	5,682	17.1%	7,152	18.6%	1,984	18.4%	2,646	22.6%*
Gastro/Esophageal Cancer	4,067	6.3%	4,717	8.1%	1,525	7.6%*	1,881	7.5%
Endocrine Tumor	3,441	19.2%	3,581	26.5%	1,599	21.1%	1,800	26.8%
Myelodysplastic Syndrome (MDS)	4,267	28.0%	4,315	31.2%	1,596	29.6%	1,643	30.9%
Head and Neck Cancer	3,558	6.7%	4,092	7.6%	1,429	7.9%	1,594	7.7%
Female GU Cancer Other Than Ovary	3,350	27.1%	4,519	26.1%	1,542	28.2%	2,017	28.1%*
High-Risk Bladder Cancer	3,159	12.1%	3,725	10.4%	1,227	8.1%*	1,410	10.9%
Kidney Cancer	2,577	80.5%	3,400	80.1%	1,272	62.5%*	1,477	63.3%*
Liver Cancer	2,762	34.4%	3,428	34.7%	1,171	34.5%	1,410	33.0%
Malignant Melanoma	1,723	38.8%	2,006	39.1%	902	23.2%*	1,132	21.5%*
Low-Risk Bladder Cancer	1,653	0.7%	3,534	1.0%	758	0.7%	1,348	1.0%
Central Nervous System (CNS) Tumor	1,955	10.4%	2,260	11.6%	743	11.2%	918	10.9%
Acute Leukemia	1,740	26.0%	2,062	27.2%	712	30.1%*	937	28.2%
Anal Cancer	806	5.3%	917	7%	317	7.9%	338	5.9%

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.

Use of immunotherapies for treatment of specific cancers generally corresponded to the U.S. Food and Drug Administration (FDA) approval of drugs and indicated uses. In the baseline period, overall use of immunotherapies was less than one percent. The proportion of episodes with immunotherapy use increased 4.5 percentage points from the baseline period to the intervention period for both OCM and comparison practices (**Exhibit 5**). The cancer bundles with the largest statistically significant increase in immunotherapy use from the baseline to intervention period, were the following which had new immunotherapies approved after 2014 (e.g., checkpoint inhibitors such as pembrolizumab and nivolumab):

- Lung cancer: Immunotherapy use increased by 29 percentage points among both OCM and comparison episodes.
- Head and neck cancer: Immunotherapy use increased by 18 percentage points for OCM episodes and by 21 percentage points for comparison episodes.
- Kidney cancer: Immunotherapy use increased by 48 percentage points for OCM episodes and by 44 percentage points for comparison episodes.
- Malignant melanoma: Immunotherapy use increased by 28 percentage points for OCM episodes and 26 percentage points for comparison episodes. More than 80 percent of episodes for malignant melanoma involved immunotherapy use in the intervention period, for both groups.

The increase in immunotherapy use for these specific cancer bundles aligns with the timing of the FDA approval and indicated use[33] of the following immunotherapies:

- Pembrolizumab (approved August 2016 for head and neck cancer; approved October 2016 for lung cancer)
- Nivolumab (approved December 2014 for malignant melanoma; approved November 2015 for kidney cancer; approved November 2016 for head and neck cancer).

Low rates of immunotherapy use in other cancer bundles may reflect off-label use; or beneficiaries having a second cancer for which the immunotherapy was approved; or FDA approval of a drug near the end of a performance period, which may affect treatment patterns more in subsequent PPs.

The rapid increase in immunotherapy among episodes for kidney cancer and malignant melanoma aligns with the decrease in Part D chemotherapy utilization for those two cancer bundles, suggesting a substitution from Part D chemotherapies in the baseline period to Part B immunotherapies in the intervention period. Exploring this change further as more data accrues, will highlight whether the OCM incentives for use of lower-cost treatment impacts the adoption and use of immunotherapies.

[33] U.S. Food and Drug Administration. Hematology/oncology (cancer) approvals and safety notifications [homepage on the internet]. Last updated 02/27/2018. Available from https://www.fda.gov/Drugs/InformationOnDrugs/ApprovedDrugs/ucm279174.htm.

Exhibit 5: Immunotherapy Utilization among OCM and Comparison Episodes from Baseline to Intervention (PP1), by Cancer Bundle

Cancer Bundle	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	
	N	%	N	%	N	%	N	%
Hormonal Only Breast Cancer	82,658	0.0%	96,267	0.0%	34,769	0.0%	38,517	0.0%
Non-Hormonal Only Breast Cancer	37,055	0.0%	39,525	0.0%	14,109	0.2%*	15,149	0.4%*
Lung Cancer	33,578	0.7%	37,396	1.4%	13,300	30.5%*	15,066	30.0%*
Low-Risk Prostate Cancer	27,808	0.0%	46,651	0.0%	11,365	0.0%	17,742	0.0%
Lymphoma	24,587	0.0%	25,218	0.0%	9,122	0.7%*	9,393	0.8%*
Colorectal/Small Intestine Cancer	22,488	0.0%	25,111	0.0%	7,843	0.6%*	8,815	0.6%*
Multiple Myeloma	18,899	0.0%	20,774	0.0%	7,837	0.3%*	8,511	0.2%*
Non-Reconciliation Eligible Cancer	13,525	0.4%	18,495	0.9%	6,425	7.9%*	8,959	7.6%*
Chronic Leukemia	12,410	0.1%	14,344	0.1%	4,965	0.2%*	5,540	0.2%*
High-Risk Prostate Cancer	12,529	0.0%	15,745	0.1%	4,899	0.4%*	5,934	0.8%*
Pancreatic Cancer	8,085	0.1%	9,339	0.0%	3,135	0.3%*	3,748	0.3%*
Ovarian Cancer	7,746	0.0%	9,399	0.0%	2,613	0.7%*	3,346	0.8%*
Gastro/Esophageal Cancer	5,922	0.1%	6,627	0.1%	2,144	1.1%*	2,570	1.5%*
Endocrine Tumor	4,611	0.1%	4,677	0.0%	2,124	1.2%*	2,305	1.0%*
Myelodysplastic Syndrome (MDS)	6,050	0.0%	5,830	0.0%	2,122	0.1%*	2,119	0.2%*
Head and Neck Cancer	5,184	0.8%	5,777	0.9%	1,994	18.5%*	2,176	21.6%*
Female GU Cancer Other Than Ovary	4,392	0.1%	5,792	0.2%	1,950	0.7%*	2,525	1.7%*
High-Risk Bladder Cancer	4,810	0.0%	5,467	0.1%	1,731	3.5%*	2,009	3.5%*
Kidney Cancer	2,899	0.4%	3,777	0.5%	1,539	48.3%*	1,725	44.1%*
Liver Cancer	3,607	0.1%	4,343	0.1%	1,451	1.4%*	1,781	2.1%*
Malignant Melanoma	2,235	53.3%	2,642	56.4%	1,247	81.0%*	1,509	82.4%*
Low-Risk Bladder Cancer	2,445	0.0%	5,368	0.0%	1,037	0.0%	1,992	0.0%
Central Nervous System (CNS) Tumor	2,669	0.2%	3,032	0.1%	965	1.0%*	1,125	0.9%*
Acute Leukemia	2,391	0.0%	2,700	0.1%	935	0.3%*	1,174	0.1%
Anal Cancer	1,098	0.5%	1,187	0.8%	408	2.7%*	465	3.4%*
TOTAL	349,681	0.5%	415,483	0.6%	140,029	5.1%*	164,195	5.0%*

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.

Novel Therapy Use

As with immunotherapies, other novel therapies tend to be more expensive than the drugs they replace, and this can materially impact total episode costs, as well as utilization and patient outcomes. Per OCM Model rules, a drug is considered a novel therapy for an indicated cancer type for two years from the date of FDA approval. We examined the use of novel therapies among OCM and comparison episodes in the intervention period,[34] by cancer bundle (**Exhibit 6**). This analysis includes use of immunotherapies meeting the novel therapy designation.

- The proportion of OCM episodes with novel therapy use (12.4 percent) was higher and statistically significantly different from the proportion of comparison episodes with novel therapy use (12.0 percent), although the magnitude of the difference is small.
- Use of novel therapies differed between OCM and comparison episodes for some cancer bundles:
  - Novel therapy use was more common among OCM episodes than comparison episodes for kidney cancer, chronic leukemia, and non-reconciliation-eligible cancers.
  - Novel therapy use was more common among comparison episodes than OCM episodes for pancreatic cancer, head and neck cancer, and liver cancer.

With only one PP of data, it is too early to determine if these differential patterns of novel therapy use between OCM and comparison episodes will persist, and we will continue to monitor use of novel therapies to evaluate whether OCM is influencing their use.

[34] CMS did not designate novel therapy status during the baseline period. Therefore, the results in this report focus on novel therapy use in the intervention period only.

Exhibit 6: Novel Therapy Utilization among OCM and Comparison Episodes in the Intervention Period (PP1)

Cancer Bundle	Intervention Period Episodes Initiating: (7/1/16-1/1/17)			
	OCM N = 140,029		COMP N = 164,195	
	N	%	N	%
Hormonal Only Breast Cancer	34,769	0.0%	38,517	0.0%
Non-Hormonal Only Breast Cancer	14,109	16.9%	15,149	17.4%
Lung Cancer	13,300	34.0%	15,066	34.7%
Low-Risk Prostate Cancer	11,365	0.0%	17,742	0.0%
Lymphoma	9,122	2.2%	9,393	2.3%
Colorectal/Small Intestine Cancer	7,843	4.4%	8,815	4.3%
Multiple Myeloma	7,837	63.3%	8,511	64.3%
Non-Reconciliation Eligible Cancer	6,425	6.4%	8,959	5.6%*
Chronic Leukemia	4,965	3.6%	5,540	2.9%*
High-Risk Prostate Cancer	4,899	0.0%	5,934	0.0%
Pancreatic Cancer	3,135	1.9%	3,748	3.2%*
Ovarian Cancer	2,613	30.2%	3,346	30.5%
Gastro/Esophageal Cancer	2,144	12.5%	2,570	11.9%
Endocrine Tumor	2,124	28.0%	2,305	26.2%
Myelodysplastic Syndrome (MDS)	2,122	0.0%	2,119	0.0%
Head and Neck Cancer	1,994	18.4%	2,176	21.3%*
Female GU Cancer Other Than Ovary	1,950	12.3%	2,525	10.8%
High-Risk Bladder Cancer	1,731	3.1%	2,009	3.1%
Kidney Cancer	1,539	54.1%	1,725	48.9%*
Liver Cancer	1,451	0.1%	1,781	0.6%*
Malignant Melanoma	1,247	88.0%	1,509	89.5%
Low-Risk Bladder Cancer	1,037	0.0%	1,992	0.0%
Central Nervous System (CNS) Tumor	965	0.0%	1,125	0.0%
Acute Leukemia	935	0.0%	1,174	0.0%
Anal Cancer	408	0.0%	465	0.0%
TOTAL	140,029	12.4%	164,195	12.0%*

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

3.1.2 Changes in Practice Characteristics from Baseline to Intervention

Patient characteristics and care delivery can vary across health care settings due to practice attributes such as size, specialty mix of providers, and affiliations with health systems. We examined how OCM and comparison practices changed along these dimensions between the baseline and intervention periods, because structural changes could impact care delivery, patient experiences, and other outcomes.

Practice Size

We used the number of chemotherapy episodes attributed to the practice or TIN in each PP quarter as a measure of practice size that is directly relevant to providing oncology services. The number of episodes is a conservative reflection of a practice's actual volume of Medicare FFS cancer patients, because an episode is only attributed to a practice if the beneficiary receives the plurality of his/her cancer E&M services at the practice.

On average, the number of attributed episodes per practice increased about 20 percent for both OCM and comparison practices, between the baseline period and the intervention period, as seen in **Exhibit 7**. It will be important to monitor whether episode volume remains higher, on average, as the Model progresses, and whether this differs for the OCM and comparisons, because practice size may influence many aspects of care delivery (e.g., electronic health record selection, new staff positions, stability of performance metrics).

Another measure of size is the number of NPIs providing cancer services. Based on this measure, we again find that OCM and comparison practices increased in size between the baseline and intervention periods, comparing the first six months of the baseline with the first PP of the intervention period. On average, the number of NPIs per practice increased from 35 to 41 for OCM practices and increased from 19 to 23 NPIs for comparison practices (**Exhibit 7**). The median number of NPIs did not increase at the same rate, suggesting that data are skewed by a few practices with very large increases over time in the number of NPIs serving cancer patients.

Exhibit 7: Practice Size among OCM and Comparison Practices from Baseline to Intervention (PP1)

Statistic	Baseline Period Episodes Initiating: (1/2/14-7/1/14)		Intervention Period Episodes Initiating: (7/1/16-1/1/17)	
	OCM N = 190	COMP N = 539	OCM N = 190	COMP N = 527
Number of Episodes				
Median	198	91	215	98
Mean	337	140	368	156
Std Dev	679	337	714	368
Number of NPIs				
Median	18	8	22	10
Mean	35	19	41	23*
Std Dev	51	35	60	41

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

In their 2017 PTPs, 90 percent of practices reported using revenue from OCM to hire additional staff. This did not vary significantly by practice size, ownership, academic affiliation, or between 2016 and 2017. During Year One case studies, over half of practices reported using MEOS payments to hire additional staff, such as NPs, patient navigators, care coordinators, social workers, financial counselors, or quality leads.

Practice Specialty Mix

We examined provider specialty (oncologist, urologist, NP/PA) of the NPIs delivering cancer services and assessed whether the increase, and practices' specialty/staffing mix, changed over time. Although the number of physician oncologist NPIs[35] increased, the proportion of NPIs who are oncologists decreased by two percentage points for both OCM and comparison practices from the baseline period to PP1. This decline was offset by an increase in the proportion of NP/PAs, which increased 3.5 percentage points among OCM practices and about 1.5 percentage points among comparison practices (**Exhibit 8**).

Exhibit 8: Practice Specialty Mix among OCM and Comparison Practices from Baseline to Intervention (PP1)

	Baseline Period Episodes Initiating: (1/2/14-7/1/14)		Intervention Period Episodes Initiating: (7/1/16-1/1/17)	
	OCM N = 190	COMP N = 539	OCM N = 190	COMP N = 527
Proportion of Specialties Per Practices				
Oncology (all sub-specialties)	64.3%	62.9%	62.2%	61.1%
NP/PA	11.1%	9.4%	14.6%*	10.8%*
Urology	4.6%	6.5%	4.5%	6.1%
Proportion of Oncology Specialties Per Practice				
Hematology/Oncology, Medical Oncology	82.3%	84.0%	82.5%	83.3%
Surgical Oncology	2.3%	1.9%	2.6%	2.0%
Radiation Oncology	11.1%	10.6%	11.0%	11.4%
Gynecologic Oncology	4.4%	3.5%	3.9%	3.3%
Proportion of Oncology-Specialty Practices				
Oncology-Specialty†	34.7%	44.0%	34.5%	42.9%

Source: Practice analytic file, 2014–2017.
Notes: * Denotes a statistically significant difference from baseline estimates to intervention estimates at p<=0.10.
† Denotes practices that contain only oncology-specialty physicians and/or NPs/PAs, as opposed to multi-specialty groups.
OCM: OCM intervention group; COMP: Comparison group.

There was no change in sub-specialties (e.g., radiation oncology, surgical oncology) among OCM and comparison practices from the baseline to intervention period. In addition, the proportion of practices that

[35] We coded NPIs as oncologists if they specialized in hematology/oncology or medical oncology, surgical oncology, radiation oncology, or gynecologic oncology.

were oncology only (not multi-specialty)[36] changed little for OCM and comparison practices, between the baseline and intervention periods.

Findings from Year One case studies support the results above that indicate a small increase in NPs and/or PAs as a proportion of all NPIs in OCM practices. Five of the 12 practices we visited in Year One told us they had hired, or were planning to hire, additional NP/PA practitioners to support OCM care process redesign initiatives.

Practice Structure and Affiliation

The proportion of OCM and comparison practices owned by a hospital or affiliated with a health system increased by more than six percentage points for the OCM practices (43.4 percent to 50.0 percent), and five percentage points for the comparison practices (54.6 percent to 59.8 percent). The latter change for comparison practices between baseline and PP1 was statistically significant.[37] The increase in health system affiliation/ownership over time aligns with the broader national trend toward greater vertical integration of hospitals and oncology physician practices in recent years.[38]

In summary, although there were some changes in cancer mix, Part D chemotherapy use, novel therapy use, and practice size and affiliation since the baseline period, it is too early to know whether these changes will persist as the Model progresses, or what impact they may have. Furthermore, some of the observed changes may be influenced by the OCM episode algorithm during PP1. We will continue monitoring these and other practice and episode characteristics as the Model progresses.

3.1.3 Practices that Withdrew During Year One

During the first Model year, six of the 196 practices that signed participation agreements voluntarily exited OCM, and three others merged together. We contacted the six practices requesting a brief conversation about their reasons for terminating. Two practices did not respond to our requests for an interview. Of these, one terminated mid-year and the other quite late in the year. We interviewed the remaining four practices that exited OCM.[39] Their primary reasons for termination included:

- Eligibility requirements. One practice did not understand until after OCM launched that having an oncologist overseeing chemotherapy treatment for patients at a critical access hospital (CAH) would render it ineligible to participate in OCM.[40]
- Resource constraints. One small practice (a single medical oncologist) did not have adequate staff or budget to hire additional staff to track patients, upload data, and perform financial analyses.

---

[36] We classified a practice or TIN as oncology-only specialty if all of its NPIs have an oncology specialty or a NP/PA specialty.

[37] Practice-level affiliation with a health system and hospital ownership were constructed using practice site-level information from the SK&A data. SK&A extracts from August 2016 and 2017 were used for the intervention period, while a historical extract from July 2015 was used to construct affiliations for the baseline period. Note that the August 2016 SK&A extract was used for the baseline period reported in the "First Annual Report from the Oncology Care Model Evaluation: Baseline Period."

[38] Alpert A, Hsi H, Jacobson M. Evaluating the role of payment policy in driving vertical integration in the oncology market. Health Affairs. 2017;36(4):680-688.

[39] The content of outreach emails and the interview guide were both approved by the Institutional Review Board.

[40] CAHs have a separate cost-report reconciliation that does not align with OCM's payment methodology.

- Closure. One practice sold all its assets and transferred its employees to a health system which intends to "use the practice as a springboard for the development of an extensive oncology service line" across its nine hospitals.

None of the withdrawn practices expressed concerns that OCM could have unintended consequences deleterious to patient care, and none reported resistance among oncologists. All three mentioned beneficial aspects of their abbreviated tenure in OCM:

- One practice's sole physician increased his use of the EHR, recording more information in structured fields, and discussed treatment topics more thoroughly with patients.
- A representative from another practice offered that CMS webinars provided the opportunity for "a lot of learning and relationship building. It was very beneficial to hear from others about having their EHR system accommodate the OCM."
- Feedback reports comparing a practice to other OCM participants were "surprising" and will be used to guide future practice activities.

3.2 Program Effectiveness: Utilization

Summary of Findings on Program Effectiveness: Utilization

In this early phase of OCM, all hospital utilization measures declined more for OCM practices than for comparison practices, and two of the declines were statistically significant: ICU stays and ED visits. This consistent pattern suggests a potential early impact of OCM on use of hospital services.

- Participating practices report using strategies such as extended hours and patient navigation in the attempt to reduce hospitalizations and emergency department visits.
- ICU admissions during the six month episode period decreased by 7 admissions per 1,000 episodes, and ED visits decreased by 15 visits per 1,000 among OCM episodes relative to comparison episodes.

OCM requires participating practices to implement enhanced services that are intended to improve access, communication, patient education, and care coordination. These improvements are expected to improve quality of care, reduce unnecessary care, such as the duplication of tests, and minimize treatment complications that can result in potentially avoidable ED visits and hospitalizations. In this chapter, we present strategies (from case studies) that practices are employing to reduce utilization, and the estimated DID impact of OCM on utilization for episodes that began during PP1. Utilization measures include hospital inpatient hospitalizations, ICU admissions, and ED visits, as well as use of chemotherapy, other drugs, post-acute care, imaging, and other Part B services. Information in this chapter comes from OCM practices' annual PTPs, case studies, and Medicare claims. All claims-based results are at the episode level and are based on DID analyses, which compare the early changes for OCM episodes with those of comparison episodes, between the baseline and intervention periods. For more information about methods, see Appendix A.

3.2.1 Use of Hospital-Based Services

OCM practices are working to identify improvements that will reduce inappropriate or potentially avoidable use of services, especially high-cost services such as ED visits, inpatient hospitalization, and ICU admissions.

Strategies to Reduce Emergency Department Use and Inpatient Admissions

The practices we visited in Year One for case studies implemented several specific strategies to manage patient symptoms in a timely manner and reduce ED use and inpatient admissions, as summarized in **Exhibit 9.**

Exhibit 9: Strategies to Address Patients' Urgent Care Needs and Reduce ED Use, Based on 12 Year One Case Studies

Strategy	Number of Practices Currently Employing Strategy*	Challenges
Extended hours on nights or weekends for supportive therapy	5	Three additional practices tried this, but discontinued the extended hours due to low use by patients.
Proactive outreach to high-risk patients	6	
Same-day and walk-in appointments	8	Three other hospital-based practices lacked the capacity for same-day appointments, either because they did not have enough space or because they did not control infusion center capacity or scheduling.
Arrangement with nearby hospital outpatient department for same-day supportive therapy on weekends	3 (1 only by appointment)	Hospital outpatient departments are generally not open for supportive therapy at night.
Arrangement with nearby urgent care center for same-day/same-night supportive therapy (e.g., hydration)	2	

Note: * Practices may implement multiple strategies summarized in this table.

During Year One case studies, many interviewees noted an early focus on improving symptom management and access for supportive therapy, particularly for high-risk patients. Many practices with this focus tried to identify the subset of OCM patients at high risk using factors such as diagnosis, highly toxic treatment, comorbidities, social circumstances (e.g., lacking social support), and patient demographics. Having identified patients at special risk, practices used proactive outreach and more frequent contacts, to recognize and address emerging problems. For example, nurse navigators may call these patients following each chemotherapy infusion, to address symptom management issues that could lead to an ED visit. In some practices, this process of identifying high risk patients and making more contacts with them is systematized via sophisticated algorithms in the EHR and automatic call scheduling. In other practices identification of high risk patients is more ad hoc, with nurses and navigators keeping their own lists of patients who need extra attention. For more information, please see Section 3.6.3.

Another area of improvement several practices considered, but few had yet implemented, was expanding urgent care services and clinic hours. Several described challenges in expanding urgent care services. For example, the four hospital-based practices we visited told us that they are space-constrained and at capacity; they cannot offer same-day urgent care visits in their current space and have no ability to expand. One hospital-based practice's internal data indicate that most cancer patients' ED visits take place during weekday hours, not evenings or weekends, but they told us that their clinics are completely filled and same-day visits are not possible. In addition, hospital-based practices often do not control scheduling or staffing of infusion centers. Clinicians in such practices told us that they have no choice but to send patients with urgent needs to the ED. We observed somewhat more flexibility among independent practices to expand space, alter schedules, and shift staff assignments to extend clinic hours and accommodate more patients for urgent care needs. In their 2017 PTPs, most OCM practices (95 percent)

reported using same-day appointments as a strategy to better address patients' urgent care needs, but fewer than 40 percent of practices offered evening and weekend clinic hours for supportive therapy, consistent with findings from case studies.

Estimated OCM Impact on Hospital Inpatient Utilization

Inpatient Hospitalizations

Nationally, the number of inpatient hospitalizations among Medicare beneficiaries declined between 2012 and 2015.[41] This trend was also evident in our OCM and comparison groups. From the baseline period to the intervention period, the proportion of episodes with an inpatient stay, and the average number of inpatient hospitalizations per episode, decreased for both OCM and comparison episodes. In addition, the proportion of episodes with a 30-day readmission and the average number of readmissions per episode decreased for both OCM and comparison episodes.

Findings from the DID impact analyses include:

- As shown in **Exhibit 10**, while impact estimates were negative, OCM had no statistically significant impact on the occurrence of inpatient hospitalizations, the number of inpatient hospitalizations, the number of inpatient days per episode, or 30-day readmissions per episode.
- Relative to comparison episodes, the number of ICU admissions decreased significantly by 0.007 admissions ($p \leq 0.05$) for OCM episodes. This represents a reduction of approximately 7 ICU admissions per 1,000 episodes, and a 5.3 percent change from the average OCM baseline ICU admissions per episode.
- The direction and magnitude of the DID impact estimates reported for hospital inpatient utilization are aligned with corresponding cost results reported in Section 3.3.1, below. We estimate that relative albeit non-statistically significant reductions in inpatient utilization among OCM episodes led to lower inpatient costs, even in this very early phase of OCM.

[41] US Department of Health and Human Services, Centers for Medicare and Medicaid Services, Office of Enterprise Data and Analytics. 2016 CMS statistics. CMS Pub. No. 03513, March 2017. Available from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMS-Statistics-Reference-Booklet/Downloads/2016_CMS_Stats.pdf.

Exhibit 10: Estimated OCM Impact for Hospital Inpatient 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
Occurrence of IP Stay	489,710	579,678	27.3%	26.2%	25.7%	24.8%	-0.2%	-0.6%	0.2%	-0.8%
# of IP Hospitalizations	489,710	579,678	0.428	0.408	0.398	0.382	-0.004	-0.012	0.004	-0.9%
# of ICU Admissions	489,710	579,678	0.123	0.118	0.116	0.118	-0.007**	-0.011	-0.002	-5.3%
# of IP Days	132,708	147,179	8.574	8.368	8.459	8.285	-0.032	-0.168	0.103	-0.4%
Occurrence of 30-Day Readmission	126,476	140,010	22.3%	21.9%	21.6%	21.4%	-0.2%	-0.8%	0.3%	-1.0%
# of All 30-Day Readmissions	489,710	579,678	0.103	0.097	0.093	0.089	-0.003	-0.006	0.001	-2.8%
Occurrence of 30-Day Unplanned Readmission	126,476	140,010	20.9%	20.3%	20.2%	19.9%	-0.3%	-0.8%	0.3%	-1.3%
# of 30-Day Unplanned Readmissions	489,710	579,678	0.093	0.087	0.084	0.081	-0.003	-0.006	0.001	-3.0%

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
*p≤0.10, **p≤0.05, ***p≤0.01

Inpatient Hospitalizations by Cancer Subgroup

We evaluated the number of inpatient hospitalizations per episode for the 10 most prevalent cancer bundles and for low- and high-risk cancer bundles[42] to assess whether findings by subgroups differ from overall findings. There was no statistically significant impact on the number of inpatient hospitalizations per episode for any subgroup (see Appendix C for these results). Small sample sizes at this point may limit our ability to detect significant changes.

Estimated OCM Impact on Use of Emergency Departments

A primary goal of OCM programmatic requirements and incentives is to reduce the incidence of adverse events and treatment complications that result in costly hospital utilization, much of which originates in the ED.[43] OCM practices we visited in Year One all told us that reducing ED use was an important early focus. In their 2017 PTPs, many practices reported offering same-day appointments (95 percent), extending hours into the evening (38 percent) or during the weekend (36 percent), stratifying patients into actionable risk cohorts (45 percent), and using OCM revenue to hire additional staff (90 percent).

ED Visits

The DID impact estimated in **Exhibit 11** shows that the number of ED visits decreased significantly by 0.015 visits ($p \leq 0.01$) among OCM episodes relative to comparisons, representing a reduction of approximately 15 ED visits per 1,000 episodes and a 2.3 percent change from the average OCM baseline value. Much of this decrease was due to a decline in ED visits that resulted in an inpatient stay, which decreased by 0.011 visits ($p \leq 0.01$) among OCM episodes relative to comparison episodes, representing a reduction of approximately 11 visits per 1,000 episodes and a 3.7 percent change from the OCM baseline value. This finding is consistent with the non-significant decline in inpatient hospitalizations reported above. There was no statistically significant change in ED visits that did not result in an inpatient stay. Section 3.6 on Supportive Care examines ED visits and hospitalizations specifically related to chemotherapy and its side effects.

ED Visits by Cancer Subgroup

We estimated the impact of OCM on the number of ED visits resulting in an inpatient stay, and the number of ED visits not resulting in an inpatient stay, for the most prevalent cancer bundles and for low- and high-risk cancer bundles (see Appendix C). For most cancer subgroups, there was no statistically significant impact of OCM, but several statistically significant findings did emerge, including:

- For a number of high-cost cancer bundles (lung cancer, colorectal cancer, lymphoma and multiple myeloma), the DID impact estimates indicate a decrease in ED visits resulting in an inpatient stay among OCM episodes relative to comparison episodes. This was because these ED visits, on average, declined for OCM episodes, but rose for comparison episodes.

---

[42] Low-risk cancer bundles were composed of breast cancer episodes using only hormonal therapies and of prostate and bladder cancer episodes using only low-risk chemotherapy regimens. Episodes in the remaining 22 cancer bundles were combined into the high-risk cancer bundle subgroup.

[43] Gonzalez Morganti, K., Bauhoff, S., Blanchard, J. C., et al. (2013). The Evolving Role of Emergency Departments in the United States. Santa Monica, CA: RAND Corporation. https://www.rand.org/pubs/research_reports/RR280.html.

- These declines in ED utilization may be a result of specific changes in care delivery, or signal targeted efforts by OCM practices to reduce utilization within high cost cancer bundles. We will continue to monitor these patterns in use within cancer bundles.

3.2.2 Use of Post-Acute and Outpatient Services

OCM promotes efficient use of health care services. One way this could be operationalized by the OCM practices is by optimizing post-acute and outpatient services, and care coordination. This section explores the extent to which there is an impact of OCM on utilization of several post-acute and outpatient services, including skilled nursing, home health, cancer-related E&M services, imaging, radiation, and outpatient therapy services.

Estimated OCM Impact on Post-Acute Services

None of the 12 practices we visited in Year One mentioned an explicit focus on opportunities to standardize or reduce post-acute care. In their 2017 PTPs, nearly all OCM practices reported providing and/or referring to hospice services (99 percent of OCM practices) and coordinating care with home health agencies (95 percent). Many practices also reported communicating with other care settings, including post-acute care: 73 percent of practices reported using structured communications (such as forms or standard reports) to communicate across care settings, 41 percent reported sharing data with clinical stakeholders outside the practice in an effort to improve care and patient experiences, and reduce cost; and 30 percent reported instituting written agreements with care partners.

Exhibit 11: Estimated OCM Impact for Emergency Department 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
Occurrence of ED Visit Not Resulting in IP Stay	489,710	579,678	23.2%	23.7%	23.8%	24.4%	-0.1%	-0.5%	0.2%	-0.5%
# of ED Visits	489,710	579,678	0.658	0.657	0.643	0.657	-0.015***	-0.024	-0.006	-2.3%
# of ED Visits Not Resulting in IP Stay	489,710	579,678	0.352	0.361	0.365	0.376	-0.002	-0.009	0.005	-0.6%
# of ED Visits Resulting in IP Stay	489,710	579,678	0.304	0.295	0.277	0.279	-0.011***	-0.018	-0.005	-3.7%

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
*p≤0.10, **p≤0.05, ***p≤0.01

Skilled Nursing Facility (SNF) Utilization

There was a general decline in SNF use from 2010 to 2015 among all Medicare beneficiaries.[44] While average per episode utilization of skilled nursing services declined from the baseline period to the intervention period for both OCM and comparison episodes, DID estimates were not statistically significant, indicating no impact of OCM for episodes in PP1 (see Appendix C).

Home Health Agency (HHA) Utilization

Average HHA utilization declined from the baseline period to the intervention period for both OCM and comparison episodes, a trend that was consistent with HHA utilization among all Medicare beneficiaries from 2010 to 2015.[45] There was no DID impact of OCM on either HHA utilization measure, for episodes in PP1 (see Appendix C**)**.

Estimated OCM Impact on Part B Outpatient Services

Cancer-Related E&M Service Utilization

Improved access to appropriate and timely care in the outpatient setting including doctor's offices, such as E&M services and other contact between patients and their care team (e.g., remote monitoring, telehealth, telephone calls, email communication), may improve care continuity and patient care experiences. Improved access may manifest as increased cancer E&M services per episode, if practices emphasize in-person services, or as decreased E&M services if telephone and other communication replaces some in-person services. It is also possible that there will be no change in outpatient E&M services if increased remote/telephonic contact (which generates no claims) enhances, but does not replace, in-person services. There may also be unintended consequences of OCM if practices increase visits for breast cancer patients on long-term hormonal therapy in order to trigger more episodes.

There was no significant OCM impact on the number of cancer E&M services in the first PP. Between the baseline and intervention periods, there were similar downward trends in the use of cancer E&M services for both OCM and comparison episodes, which decreased 5.1 percent among OCM episodes between the baseline period and intervention period, and 4.2 percent among comparison episodes. See Appendix C for results.

---

[44] US Department of Health and Human Services, Centers for Medicare and Medicaid Services, Office of Enterprise Data and Analytics. 2016 CMS statistics. CMS Pub. No. 03513, March 2017. Available from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMS-Statistics-Reference-Booklet/Downloads/2016_CMS_Stats.pdf.

[45] US Department of Health and Human Services, Centers for Medicare and Medicaid Services, Office of Enterprise Data and Analytics. 2016 CMS statistics. CMS Pub. No. 03513, March 2017. Available from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMS-Statistics-Reference-Booklet/Downloads/2016_CMS_Stats.pdf.

Use of Part B Imaging Services

Improved care coordination and communication among all providers involved in a patient's care could improve efficient use of services, such as reducing the number of duplicate images (e.g., x-rays), reducing the frequency of routine imaging, or using lower-cost images that are reasonable substitutes for high-cost images.

The majority of both OCM and comparison episodes (86 to 88 percent) included at least one imaging service (advanced, standard, or other) in the baseline and intervention periods. DID analysis shows no OCM impact on the occurrence or number of standard/other or advanced imaging services (see Appendix C). The average number of imaging services (all types) per episode declined by nearly 0.4 services from the baseline period to PP1 (400 services per 1,000 episodes), for both OCM and comparison episodes. This change was entirely due to a reduction in the number of standard and other imaging services, while the number of advanced imaging services did not change.

Although these results indicate no statistically significant OCM impact thus far in use of imaging services among OCM episodes relative to comparison episodes, five of the 12 practices we visited in Year One told us that OCM spurred them to consider strategies to reduce imaging and related costs. These strategies included monitoring oncologists' ordering patterns, altering timing of imaging in treatment regimens, and reviewing costs of freestanding imaging centers to which they refer patients. The changes they described may take more time to become evident in claims-based measures. For example, a health system-owned practice told us that historically, images were ordered at each visit (each cycle) for many patients, but they now encourage oncologists to order images only when the results could affect a patient's treatment plan, which they expect will reduce the frequency of imaging. An independent practice described difficulty obtaining patients' comprehensive records from other providers, resulting in redundant imaging; they anticipate that better EHR interoperability in the future may reduce the number of redundant tests. Two independent practices refer their patients to external/freestanding imaging centers that they know to be high-cost. One of these practices is opening its own imaging center on site and plans to charge less than competitors, but the other will continue to use the preferred freestanding imaging center which they feel is exceptionally high quality.

Use of Radiation Therapy Services

Improved communication among clinicians, and adherence to national clinical guidelines, may also lead to more-appropriate use of radiation therapy services. For example, short-course radiation treatment is appropriate for some breast cancer patients.[46] The number of radiation services per episode decreased by 14.5 percent among OCM episodes from the baseline period to the intervention period, and by 14.0 percent among comparison episodes (see Appendix C).[47] Despite these changes in utilization, our DID analyses found no impact on the number of radiation therapy services among OCM episodes. As reported in Section 3.3.1 below, radiation therapy costs per episode also decreased between the baseline and intervention periods, for both OCM and comparison episodes.

---

[46] NCCN Guideline for radiation treatment in breast cancer available at: https://www.tri-kobe.org/nccn/guideline/breast/english/breast.pdf, accessed on March 16, 2018.

[47] The occurrence of radiation therapy was also evaluated, but baseline trends for OCM and comparison episodes were not statistically parallel. Results are omitted from the report as the assumptions for the DID analysis were not met.

Use of Outpatient Rehabilitation Therapy Services

The use of outpatient rehabilitation services[48] increased from the baseline period to the intervention period for both OCM and comparison episodes, but the DID impact estimates indicate no significant differences between OCM and comparison episodes (Appendix C).

3.2.3 Chemotherapy and Other Drug Utilization

We examined chemotherapy and other drug utilization because OCM may, over time, affect the types of chemotherapy used (oral or infused), or the settings in which chemotherapy is delivered (in-office, in-hospital, at home). Further, OCM may influence a practice's adherence to national clinical guidelines, use of supportive care drugs, and efforts to improve patient adherence to prescribed oral treatments. This section presents information about the impact of OCM on Part B and Part D drug use and services. We remind the reader that for OCM, chemotherapy includes cytotoxic treatment, hormonal therapy, and immunotherapy.

As reported in Section 3.1, the unadjusted proportion of episodes triggered by Part D chemotherapy and using Part D chemotherapy[49] increased for both OCM and comparison episodes from the baseline period to the intervention period. Part D (oral) chemotherapy appears to be increasing in importance, in cancer treatment. The risk-adjusted proportion of episodes that included any Part D chemotherapy drug also increased for both OCM and comparison episodes, as shown in **Exhibit 12**. While reliance on Part D chemotherapy increased over time, for both intervention and comparison episodes, OCM had no estimated DID impact on the occurrence of Part D chemotherapy, the number of Part D 30-day equivalent prescription fills per episode, the number of Part D fills per episode, or the number Part B drug services.[50] Based on the first PP, it appears that OCM is not impeding adoption of oral chemotherapies, or having any corresponding impact on the volume of Part B services. In future reports, we will explore utilization and cost of Part B and Part D chemotherapies further, to identify any emerging trends.

[48] Use of outpatient rehabilitation services is measured as the proportion of episodes with at least one outpatient therapy service, and also as the number of outpatient therapy services per episode.

[49] The proportion of episodes triggered by Part D chemotherapy drugs (i.e., prescribed oral therapy rather than infused chemotherapy) or proportion of episodes using Part D chemotherapy (i.e., Part D prescription drug event, or PDE, filled during the episode) is limited to episodes for beneficiaries enrolled in Part D.

[50] The number of Part B chemotherapy services was evaluated, but omitted from this report because trends in the two groups were statistically different in the baseline period and the parallel trend assumption for the DID analyses was not met.

Exhibit 12: Estimated OCM Impact for Drug 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
Part D Drugs										
Occurrence of Part D Chemo Use	393,970	471,502	55.4%	56.7%	55.7%	56.8%	0.1%	-0.3%	0.5%	0.3%
# of Part D Fills	393,970	471,502	23.581	23.098	23.400	22.981	-0.063	-0.212	0.086	-0.3%
# of Part D 30-Day Equivalents	393,970	471,502	29.279	30.169	29.365	30.329	-0.074	-0.229	0.081	-0.3%
Part B Drugs										
# of Part B Drug Services	489,710	579,678	19.808	19.590	19.196	19.081	-0.104	-0.438	0.231	-0.5%

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

3.3 Program Effectiveness: Cost of Care

Summary of Findings on Program Effectiveness: Cost of Care

While current results do not yet show meaningful savings (without MEOS or PBP included in the calculations), the direction of the cost impact estimates correspond to their related utilization measures and efforts made by OCM practices in the first performance period.

- There was no statistically significant impact of OCM on TCOC, Part A and B costs, or Part D costs per episode. Also no significant OCM impact on Part B chemotherapy costs.
- Part D chemotherapy costs increased for OCM by $294 per episode relative to the comparison group, representing a 6.3 percent increase from baseline.
    - Part D chemotherapy beneficiary cost-sharing increased by $31 (8.0 percent change) for OCM six-month episodes relative to comparison episodes.
- About half of OCM and comparison respondents reported spending less than $500 out-of-pocket in the prior year for cancer-related costs.
- All 12 practices we visited now advise their Medicare patients about OOP costs. This was a new activity for five of the 12 practices, started because of OCM.

OCM aims to improve the quality of cancer care while maintaining, if not reducing, associated Medicare health care costs. This section addresses two important cost questions: did total episode cost of care change, and did associated beneficiary cost-sharing change, for costs incurred during episodes that began in the PP1 of OCM? As in the previous sections, all results presented are at the episode level.

This section begins with a descriptive summary of the Medicare cost categories that comprise OCM and comparison episodes; data in this summary are not regression-adjusted. Next, DID results are presented, estimating the early impact of OCM by comparing changes in costs for OCM episodes to changes in costs for comparison episodes, between the baseline and intervention periods. The estimated DID impact of OCM is shown for several cost measures, specifically: Medicare episode total costs of care (TCOC), total costs for Part A and B claims, and total costs for Part D claims. We then break out health care costs for Part A acute care and post-acute and long-term care services, Part B services, and chemotherapy and cancer-related services. This section ends with estimated OCM impacts on beneficiary cost-sharing, and patient survey results on OOP spending. For more information about the analytic methods used, see Appendix A.

We examine the costs of care using Medicare payments. Part A and B costs are based on standardized cost variables. These costs exclude geographic differences in labor costs and practice expenses. Part D costs, however, are not standardized. We did not winsorize or trim extreme cost values, and we also did not adjust costs for inflation between 2014 and 2017, for either the OCM or comparison group. These costs also ***exclude*** PBP and MEOS payments billed under Part B by OCM practices in the intervention period, because billing data for PP1 were not available in time for inclusion in this report.

3.3.1 Composition of Health Care Costs

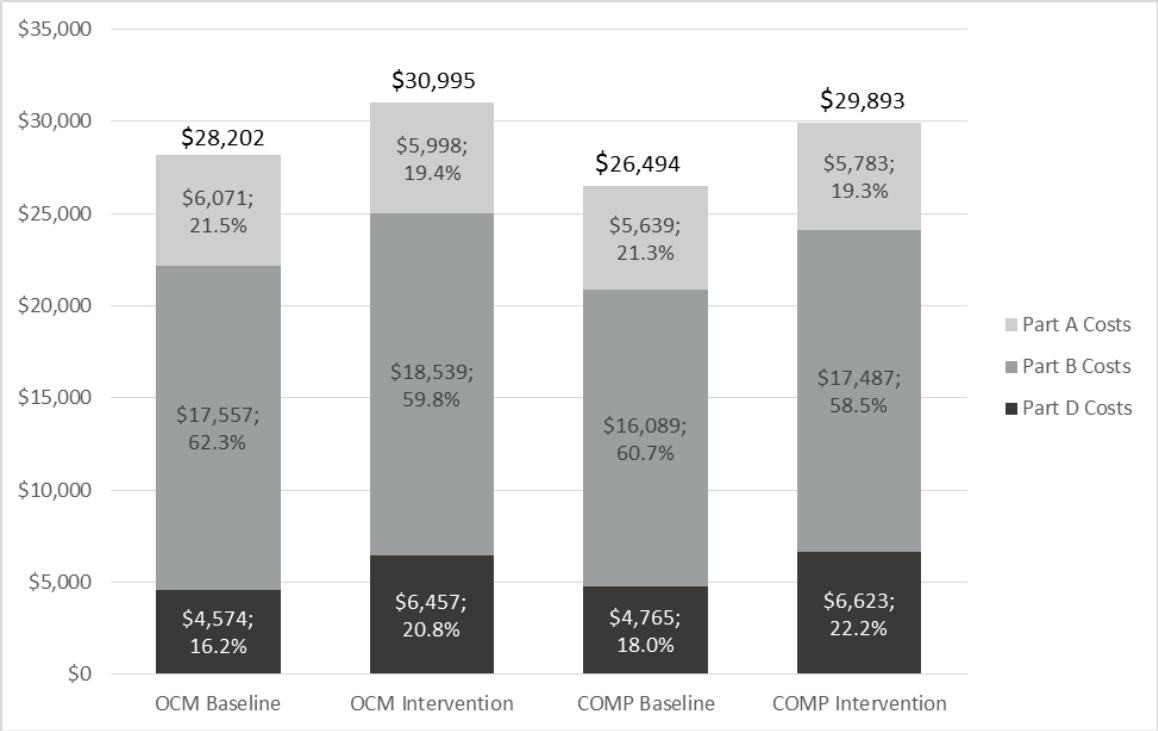
Examining the composition of episode-level costs, and how shares of each cost component change over time, can help identify areas where reductions might be expected to have the most impact on overall

episode costs. **Exhibit 13** shows the components of TCOC for OCM and comparison episodes along with the shares of the respective cost components.

Looking first at unadjusted changes in cost levels (i.e., not regression-adjusted), TCOC for OCM episodes increased from $28,202 in the baseline period to $30,995 in the intervention period, a change of almost 10 percent. Average TCOC for comparison episodes was lower than the OCM mean in the baseline period ($26,494), but rose to $29,893, an increase of almost 13 percent.

In terms of composition of overall costs, Part B costs represented the majority (nearly 60 percent) of all Medicare costs incurred for both OCM and comparison episodes in the intervention period; Part A costs and Part D costs constituted a similar share of the remaining balance—19 percent and just over 20 percent, respectively. There were shifts in the composition of costs over time, as Part D costs increased as a proportion of TCOC by about four percentage points from the baseline to the intervention period for both OCM and comparison episodes.

Exhibit 13: Unadjusted Average TCOC per Episode, Baseline and PP1



Source: Episode analytic file, 2014–2017.

Exhibit 14 presents episode-level Part A, B, and D costs for OCM and comparison episodes. Key findings include:

- Part B costs represented approximately 60 percent of TCOC during the intervention period. Part B drug costs were the largest driver of increases in overall Part B costs between the baseline and the intervention period. Costs for Part B drugs (chemotherapy and other drugs) represented over 60 percent of overall Part B costs for both OCM and comparison episodes.

  - Chemotherapy drugs accounted for over 70 percent of Part B *drug* costs. The proportion of Part B costs attributed to chemotherapy drugs increased by about 2 percentage points for both OCM and comparison episodes.

- Part A costs represented about 20 percent of TCOC during the intervention period. Inpatient costs represented over 60 percent of all Part A costs for both OCM and comparison. The majority of the remainder were SNF costs and HHA costs, each of which amounted to just over 10 percent of Part A costs.
  - There was a slight increase in the proportion of Part A costs attributed to inpatient costs between the baseline and intervention period for both OCM and comparison episodes.
- Part D costs represented just over 20 percent of TCOC during the intervention period. Costs for chemotherapy drugs amounted to over 80 percent of Part D costs for both OCM and comparison episodes. The proportion of Part D costs for chemotherapy drugs increased by 4.2 percentage points for OCM episodes and by 2.7 percentage points for comparison episodes, from the baseline to the intervention period.
- Overall, the combined costs of Part B drugs and Part D drugs accounted for almost 60 percent of TCOC for both OCM and comparison episodes in the intervention period.

Exhibit 14: Unadjusted Components of Episode Costs, Baseline and PP1, OCM vs. Comparison Episodes

Payment Category	OCM Baseline			OCM Intervention			COMP Baseline			COMP Intervention		
	Mean	% of Part	% of TCOC	Mean	% of Part	% of TCOC	Mean	% of Part	% of TCOC	Mean	% of Part	% of TCOC
Part A, B, and D TCOC	$28,202		100.0%	$30,995		100.0%	$26,494		100.0%	$29,893		100.0%
Part A Costs	$6,071	100.0%	21.5%	$5,998	100.0%	19.4%	$5,639	100.0%	21.3%	$5,783	100.0%	19.3%
Inpatient (IP) Costs	$3,855	63.5%	13.7%	$3,866	64.5%	12.5%	$3,508	62.2%	13.2%	$3,631	62.8%	12.1%
SNF Costs	$654	10.8%	2.3%	$624	10.4%	2.0%	$627	11.1%	2.4%	$615	10.6%	2.1%
Home Health Agency Costs	$698	11.5%	2.5%	$660	11.0%	2.1%	$604	10.7%	2.3%	$590	10.2%	2.0%
IP Rehab Costs	$230	3.8%	0.8%	$240	4.0%	0.8%	$150	2.7%	0.6%	$167	2.9%	0.6%
Long Term Care Costs	$127	2.1%	0.5%	$98	1.6%	0.3%	$115	2.0%	0.4%	$84	1.5%	0.3%
Hospice Costs	$455	7.5%	1.6%	$468	7.8%	1.5%	$413	7.3%	1.6%	$428	7.4%	1.4%
Other Part A Costs	$52	0.9%	0.2%	$42	0.7%	0.1%	$222	3.9%	0.8%	$268	4.6%	0.9%
Part B Costs	$17,557	100.0%	62.3%	$18,539	100.0%	59.8%	$16,089	100.0%	60.7%	$17,487	100.0%	58.5%
Imaging Costs	$841	4.8%	3.0%	$804	4.3%	2.6%	$813	5.1%	3.1%	$801	4.6%	2.7%
Lab Costs	$503	2.9%	1.8%	$503	2.7%	1.6%	$406	2.5%	1.5%	$415	2.4%	1.4%
Radiation Therapy Costs	$832	4.7%	3.0%	$783	4.2%	2.5%	$836	5.2%	3.2%	$834	4.8%	2.8%
Chemo Drug Costs	$7,830	44.6%	27.8%	$8,593	46.4%	27.7%	$6,942	43.1%	26.2%	$7,936	45.4%	26.5%
Non-Chemo Drug Costs	$2,920	16.6%	10.4%	$3,320	17.9%	10.7%	$2,406	15.0%	9.1%	$2,839	16.2%	9.5%
Chemo Administration Costs	$640	3.6%	2.3%	$622	3.4%	2.0%	$699	4.3%	2.6%	$679	3.9%	2.3%
Cancer-Related E&M Costs	$438	2.5%	1.6%	$403	2.2%	1.3%	$367	2.3%	1.4%	$344	2.0%	1.2%
Other E&M Costs	$903	5.1%	3.2%	$882	4.8%	2.8%	$797	5.0%	3.0%	$803	4.6%	2.7%
Other Non-Institutional Costs	$1,309	7.5%	4.6%	$1,242	6.7%	4.0%	$1,154	7.2%	4.4%	$1,104	6.3%	3.7%
Other Institutional Costs	$1,340	7.6%	4.8%	$1,386	7.5%	4.5%	$1,671	10.4%	6.3%	$1,733	9.9%	5.8%
Part D Costs	$4,574	100.0%	16.2%	$6,457	100.0%	20.8%	$4,765	100.0%	18.0%	$6,623	100.0%	22.2%
Chemo Drug Costs	$3,728	81.5%	13.2%	$5,531	85.7%	17.8%	$3,854	80.9%	14.5%	$5,534	83.6%	18.5%
Other Drug Costs	$847	18.5%	3.0%	$926	14.3%	3.0%	$911	19.1%	3.4%	$1,089	16.4%	3.6%

Source: Episode analytic file, 2014–2017.
Notes: OCM: OCM intervention group; COMP: Comparison group; Int.: Intervention period

3.3.2 Impact of OCM on Cost of Care

Estimated OCM Impact on Total Episode Cost of Care

OCM incentivizes practices to manage episode costs by providing them with a semi-annual PBP if they achieve savings relative to a target amount.[51] For this reason, monitoring the impact of OCM on TCOC is a key evaluation focus. Below we present results from the DID trend analysis for three core measures of overall Medicare expenditures:

- TCOC, defined as total Part A costs, B costs (not including MEOS payments or PBP), and D costs of care during an episode
- Part A costs and B costs (not including MEOS payments) per episode, reflecting payments for services received specifically under these benefits
- Part D costs per episode, measured as the sum of the low-income cost-sharing amount (LICS) and reinsurance, or 80 percent of the gross drug cost above the OOP threshold (GDCA)[52]

All tables in this section provide regression-adjusted means along with the DID impact estimates.

Exhibit 15 presents key findings about TCOC:

- Average model-adjusted TCOC per episode increased similarly for both OCM and comparison practices between the baseline and intervention periods (from a mean of over $27,000 to a mean of approximately $30,000). The increase in average costs over time was evident for Parts A and B, and for Part D.
- There was no statistically significant impact of OCM on TCOC, Part A and B costs, or Part D costs per episode during the intervention period.

[51] PBP amounts are not included in this annual report because they were not available at the time of the analyses.

[52] Part D costs were restricted to episodes for the subset of beneficiaries enrolled in Part D for all months of the episode. Separate results are provided for Part D Costs and Part D Gross Drug Costs (GDC). GDC includes payments made by all parties (including the health plan and beneficiaries in addition to Medicare), and is calculated as the sum of ingredient costs, dispensing fee, sales tax, and vaccine administration fee.

Exhibit 15: Estimated OCM Impact for Total Costs 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
TCOC (Part A, B, and D Costs)	489,710	579,678	$27,484	$30,313	$27,204	$30,206	-$173	-$446	$100	-0.6%
Part A & B Costs	489,710	579,678	$22,709	$24,099	$22,374	$23,968	-$204	-$448	$39	-0.9%
Part D Costs	393,970	471,502	$5,881	$7,703	$5,911	$7,636	$96	-$18	$210	1.6%
Part D Gross Drug Costs	393,970	471,502	$9,119	$11,366	$9,250	$11,463	$34	-$136	$204	0.4%

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

TCOC by Cancer Subgroup

To assess whether overall findings varied for different cancer bundles, we analyzed episode-level TCOC for the 10 most prevalent cancer bundles, and separately by high-risk vs. low-risk cancer bundles.[53] See Appendix D for these results.

- For most cancer bundles, the DID impact estimates were not statistically significant, indicating that, as with the overall finding, OCM episode costs for different cancer types did not change relative to comparison episodes.
- There was a decline in TCOC for OCM episodes relative to comparisons, for two cancer bundles: breast cancer episodes treated with other than hormonal-only therapies, and lymphoma episodes.
- There was no impact on TCOC for low- or high-risk cancer bundles.

Estimated OCM Impact on Episode Part A Cost Components

As described earlier, practices participating in OCM are required to implement enhanced services and quality improvement efforts designed to improve care coordination, and are incentivized to reduce use of inappropriate or potentially avoidable services. OCM promotes efficient use of high-cost services (such as hospitalization) as well as appropriate use of post-acute and outpatient services. This section examines changes between the baseline and intervention period in Part A acute care costs, post-acute, and long-term care costs for OCM and comparison practices. Trends and DID impact estimates are presented.

Overall, there was no impact of OCM on Part A acute care costs during the intervention period. For both OCM and comparison episodes, average inpatient and readmission costs changed little between the baseline and intervention periods. There was also no impact on Part A post-acute and long-term care costs, per episode. It is worth noting that, while not statistically significant, many of the Part A cost impact point estimates were negative (costs declined), which is consistent with OCM goals. The complete results of these analyses are included in Appendix D. The DID results for Part A cost components are also consistent with the utilization findings presented earlier.

Inpatient Costs by Cancer Subgroup

We examined whether impacts on episode-level inpatient costs varied for the most prevalent cancer bundles, or by cancer bundle risk (see Appendix D). The lack of impact on inpatient costs overall held true for both low- and high-risk cancer bundles, and all cancer bundles except episodes for beneficiaries with chronic leukemia for whom we identified a statistically significant decrease of $394 in average inpatient costs for OCM episodes between the baseline and intervention period.

Estimated OCM Impact on Episode Part B Costs

Under OCM, expanded care coordination and communication among providers are expected to improve efficiency in health care delivery and reduce costs. This may manifest as reductions in unnecessary or low-value services and increased use of effective but less costly therapies and services.

[53] Low-risk cancer bundles included breast cancer episodes using only hormonal therapies, and prostate and bladder cancer episodes using only low-risk chemotherapy regimens. Episodes in the remaining 22 cancer bundles were combined into the high-risk cancer bundle subgroup.

DID impact estimates for the components of standardized Part B costs (not including MEOS payments to OCM practices) suggest no OCM impact on most Part B cost components (see Appendix D). While we show that both cancer-related E&M utilization and cancer-related E&M costs did not change statistically (**Exhibit 16** below), we identified a small but statistically significant decrease of $31 in overall E&M costs for OCM episodes ($p \leq 0.01$, 2.4 percent change from the average baseline value) relative to comparison episodes (see Appendix D).

The overall findings for Part B costs are in the same direction as the Part B utilization results presented earlier in this report. However, the reduction in E&M costs is not consistent with case study findings (see Section 3.6.3 below) indicating that practices are striving to bring patients into the office for supportive care such as hydration (i.e., more E&M services) to avoid the need for ED visits. It is possible that the two findings will align over time, as practices continue redesigning care processes to improve supportive care.

Estimated OCM Impact on Episode Chemotherapy Costs and Other Cancer-Related Costs

We examined chemotherapy and non-chemotherapy cancer-related costs. These costs are especially relevant for OCM, and, as shown earlier in **Exhibit 14,** represent a sizeable proportion of overall drug costs for Medicare beneficiaries with cancer. OCM may affect use of different types of chemotherapy, or the settings in which chemotherapy is delivered (in-office, in-hospital, at home). Further, OCM may influence a practice's adherence to evidence-based guidelines, use of supportive care drugs, and patient education about medication adherence. Any such shifts in cancer care have implications for associated health care costs under OCM.

Exhibit 16 presents the DID impact estimates for measures of chemotherapy and other cancer-related costs. OCM had no impact on total chemotherapy (Part B and D), Part B chemotherapy, or Part B cancer-related E&M costs. There was, however, an increase in Part D chemotherapy costs for OCM episodes relative to comparison episodes.

Exhibit 16: Estimated OCM Impact for Chemotherapy and Other Cancer-Related Costs 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
Chemotherapy Drug Costs										
Part B and Part D Chemo Costs	489,710	579,678	$11,252	$13,734	$11,160	$13,534	$108	-$131	$348	1.0%
Part B Chemo Costs	489,710	579,678	$7,423	$8,334	$7,266	$8,203	-$27	-$281	$227	-0.4%
Part D Chemo Costs	393,970	471,502	$4,702	$6,760	$4,754	$6,518	$294 ***	$171	$418	6.3%
Part D Chemo Gross Drug Costs	393,970	471,502	$6,822	$9,417	$6,874	$9,239	$230 **	$42	$418	3.4%
Hormonal Only or Low-Risk Chemo Costs	489,710	579,678	$179	$191	$181	$192	$1	-$4	$7	0.7%
Other Cancer-Related Costs										
Part B Chemo Admin Costs	489,710	579,678	$641	$660	$681	$692	$8	-$9	$24	1.2%
Part B Radiation Therapy Costs	489,710	579,678	$808	$732	$883	$825	-$18	-$40	$4	-2.2%
Part B Cancer-Related E&M Costs	489,710	579,678	$423	$390	$381	$353	-$6	-$15	$3	-1.4%

Source: Episode analytic file, 2014–2017.
Notes: All measures were calculated at the episode level. Part D chemotherapy costs and Part D chemotherapy gross drug costs were restricted to episodes for the subset of beneficiaries enrolled in Part D for all months of the episode. 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

Between the baseline and intervention periods, mean total chemotherapy costs (Part B and Part D combined) increased at the same rate for both OCM and comparison episodes, resulting in no statistically significant impact on costs for OCM episodes. For Part B chemotherapy, trends in costs were also similar for the two groups, and the DID impact estimate was not statistically significant. These findings suggest no early impact of OCM on Part B, or combined Part B and D, chemotherapy costs. In contrast, while average Part D chemotherapy costs increased for both OCM and comparison episodes, the increase was greater for OCM episodes, resulting in an estimated overall DID increase of $294 for OCM episodes relative to comparisons ($p \leq 0.01$, 6.3 percent change from the average baseline value).

Trends in other cancer-related services varied. Average Part B chemotherapy administration costs increased for both OCM and comparison episodes between the baseline and average periods, while average Part B cancer-related E&M service and radiation therapy costs decreased for both groups. For all of these outcome measures, cost trends were similar for the two groups, and we estimate no OCM impact. These results correspond to the results from our analyses of cancer-related health care utilization presented in Section 3.2.

Part D Chemotherapy Costs by Cancer Subgroup

Due to the statistically significant impact estimates for Part D chemotherapy costs, we estimated the DID impact of OCM on Part D chemotherapy costs for the most prevalent cancer bundles, and for low- and high-risk cancer bundles, to understand whether these results are due to specific types or risk levels. The complete results of these analyses are in Appendix D. Here, we highlight cancer types for which we identified a significant impact of OCM on Part D chemotherapy costs, in both low- and high-risk cancer bundles.[54]

- For low-risk cancer bundles, the estimated increase in Part D chemotherapy costs was $10 ($p \leq 0.05$, 26.9 percent change from the average OCM baseline value) for OCM episodes, relative to comparisons. We also observed small, but significant impact estimates for Part D chemotherapy costs within two of the primary low-risk cancer bundles—breast cancer episodes treated with hormonal therapy ($3, 9.1 percent change) and low-risk prostate cancer episodes ($40, 57.7 percent change). For beneficiaries with these cancers, average Part D chemotherapy costs decreased for comparison episodes between the baseline and intervention periods, but increased on average for OCM episodes.
- An increase in Part D chemotherapy costs was also observed for high-risk cancer bundle episodes; the estimated increase in Part D chemotherapy costs was $368 ($p \leq 0.01$, 4.9 percent change) for OCM episodes, relative to comparisons. This finding was a result of large increases in Part D chemotherapy costs within two high risk cancer bundles. Relative to comparison episode costs, OCM costs for high-risk prostate cancer episodes increased by $813 ($p \leq 0.10$, 4.5 percent change from the average OCM baseline value), and OCM costs for chronic leukemia episodes increased by $1,438 ($p \leq 0.01$, 7.5 percent change).

Changes in per-episode Part D chemotherapy costs (and differences between OCM and comparison episodes) may be due to a number of factors, including availability of Part D chemotherapies, changes in beneficiary medication adherence, shifts in treatment regimens and/or duration of chemotherapy, or changes in the types of patients who are treated. Additional PPs are needed to draw conclusions about Part D chemotherapy costs.

[54] See footnote 49.

Practice's Strategies to Control Financial Risk Due to High Drug Costs

Part B drugs are not only a large share of Medicare's episode costs; maintaining the necessary inventory is also a substantial operating cost for oncology practices due to the high cost of many infused chemotherapy drugs. Practices are also at financial risk if a patient who requires a costly infused drug lacks insurance for the 20 percent Part B copayment. During Year One case studies, some interviewees described reliance on 340B hospitals to reduce the financial risk arising from under-insured patients who require costly infusions, and a few described strategies to minimize waste of costly drugs.

340B Hospital Infusion Services for Under-Insured Patients

Hospitals that are eligible to participate in the 340B Drug Pricing Program pay reduced prices for drugs.[55] Independent oncology practices are not eligible to participate in this program. OCM practices affiliated with or owned by a health system that has a hospital with 340B status, can send under-insured patients to that hospital for their chemotherapy infusions. Even practices without such affiliations may schedule their patients' infusions at a nearby 340B hospital as this may be financially advantageous for both the practice (avoiding potential losses) and the patient (lower OOP costs).

All oncologists we interviewed in independent practices prefer to infuse patients in their own outpatient infusion centers so that they can oversee the quality of care provided and attend to any unexpected problems. They also explained that care is more complicated, and adherence potentially impaired, when a patient must come to the oncologist's office for pre-infusion lab work, and then go to a hospital (whether nearby or far away) for their infusion. The four health system-owned practices we visited could accommodate patients without secondary insurance, since all are non-profit and provide uncompensated (charity) care—one of these also participates in the 340B program. Three independent practices we visited in the early months of OCM occasionally send under-insured patients elsewhere for chemotherapy infusions due to drug costs. For example, one independent practice is located more than 20 miles from the nearest 340B hospital, but schedules infusions there for under-insured patients who need very costly drugs (i.e., drugs for which the uncovered 20 percent copayment would be a substantial financial loss for the practice and/or an untenable debt for the patient). Oncologists at the five independent practices we visited later in the year did not report referring under-insured patients to 340B hospitals for infusion of high cost drugs.

Minimizing Drug Wastage

Staff at two practices told us about new efforts since the start of OCM to reduce drug waste, by revising prescribing guidelines to avoid opening a second vial of an infusion drug if only a small amount will be used (e.g., dose rounding down). Many practices have dispensing pharmacies and ship oral drug refills to their patients. A very large independent practice has a team of pharmacy technicians who call every patient regularly to ask about adherence and side effects before mail shipping the next oral medication refill. This strategy was implemented long before OCM began, in an effort to avoid sending expensive medications to patients who do not yet need them.

3.3.3 Beneficiary Cost-Sharing

In all 12 practices we visited, financial counselors meet with patients who are concerned about OOP costs to identify sources of financial assistance (e.g., from private foundations). This was a new activity for five of the 12 practices, started because of OCM. (See also discussion in Section 3.5.2 on estimating OOP

[55] https://www.hrsa.gov/opa/faqs/index.html.

costs as part of the Care Plan.) Whether or not practices previously estimated OOP on a routine basis, all told us that they strive to find financial assistance for all who request it. Private foundations are important sources of copay support for cancer patients. One challenge practices encounter is that foundations typically have annual budgets, and their resources are often depleted before the end of December. Patients who begin treatment late in the calendar year may therefore not have access to this assistance. Many hospitals and health systems have their own philanthropic foundations, from which oncology patients in affiliated practices may also receive assistance.

Five of the 12 practices we visited help underinsured patients enroll in secondary insurance plans or obtain other government benefits. One small practice refers patients to the Area Agency on Aging for help locating secondary insurance or applying for government benefits, and four practices offer this assistance in house. One practice asks patients to bring their tax returns to their appointment with a financial counselor to help determine whether the patient is eligible for Medicaid in addition to Medicare. For Medicare patients without a Part D plan, the five practices will recommend a plan and help a patient enroll. If a patient's Part D plan does not include the necessary drug(s) on its formulary, the practice may recommend changing Part D plans during the next open enrollment period.

For some high-cost drugs, pharmaceutical companies offer Patient Assistance Programs (PAPs) to cover copays and gaps in a patient's private insurance coverage. Medicare beneficiaries, and those dually eligible for Medicare and Medicaid, cannot use both their Part D/Medicaid coverage and these PAPs.[56] One practice reported that it works with low-income patients to determine whether it would be more financially beneficial for the patient to use his or her insurance coverage or to enroll in the PAP, depending on the generosity of the PAP. None of the 12 practices we visited reported that this prohibition on the use of PAP in conjunction with Medicare/Medicaid creates an access or affordability problem for patients, because their financial advocates are always able to locate other financial assistance.

We have two sources of information about beneficiary OOP costs: Medicare claims and the patient survey. Claims analysis shows a slight impact of OCM in increasing OOP costs, largely related to Part D drug costs, while survey results show no change over time. The increase measured by claims was likely too small to be reflected in survey responses.

Beneficiaries with cancer have some of the highest OOP costs in Medicare. Excluding monthly premiums, Medicare beneficiaries' costs include deductibles and coinsurance, unless a beneficiary has a supplemental source of health insurance coverage that covers these costs (e.g., Medigap secondary insurance, Medicaid, or a retiree health plan).[57,58,59] To monitor beneficiary cost-sharing under OCM, we

---

56 https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/PAPData.html.

57 Noe-Miller, C.L. Medicare beneficiaries' out-of-pocket spending for health care. Insight on the Issues: Washington, DC: AARP Policy Research Institute, October 2015. Available from https://www.aarp.org/content/dam/aarp/ppi/2015/medicare-beneficiaries-out-of-pocket-spending-for-health-care.pdf.

58 Under Part A, beneficiaries are responsible for an annual deductible for hospitalizations, coinsurance for hospital stays beyond 60 days, and coinsurance for days 21 through 100 in SNFs. Under Part B, all beneficiaries pay an annual deductible and then beneficiaries typically pay 20 percent coinsurance for certain services. Beneficiary cost-sharing requirements for the standard Part D benefit vary by the stage of the coverage (i.e., initial coverage, coverage gap or "donut hole," and catastrophic coverage). Generally, Plan D coverage includes an initial beneficiary deductible and a coinsurance for drug costs during the initial coverage period. A beneficiary is then responsible for a higher rate of coinsurance during the coverage gap and a small copay/co-

calculated total beneficiary deductible and coinsurance costs for Parts A, B, and D per episode, as well as for Part B and D chemotherapy. Since overall cost-sharing levels were similar for OCM and comparison episodes in the baseline period, any differential change in cost-sharing over time will be due to differences in episode characteristics (controlled for to the extent we can in impact analyses) or differences in service use, including type and cost of drugs.

Exhibit 17 presents regression-adjusted means and the estimated OCM impact for beneficiary cost-sharing, including deductibles and coinsurance. Average beneficiary costs per episode increased between the baseline and PP1 for both OCM and comparison episodes. While OCM had no impact on Part B cost-sharing, it did have an impact on beneficiary cost-sharing for Part A and Part D. Relative to comparison episodes, OCM Part A beneficiary cost-sharing per episode decreased by $9 ($p<0.05$, -2.1 percent change from the average baseline value) while OCM Part D beneficiary cost-sharing per episode increased by $17 ($p\leq0.05$, 2.6 percent change). Beneficiary episode cost-sharing for Part D chemotherapy also increased for OCM episodes relative to the comparison group ($31, $p\leq0.01$, 8.0 percent change), which corresponds to the observed increase in OCM Medicare Part D chemotherapy costs reported earlier in **Exhibit 16**.

In the OCM patient surveys, respondents self-reported their OOP expenses during the past year for cancer care or medications, using one of six expense categories: “less than $100,” “$100-$499,” “$500-$999,” “$1,000-$1,999,” “2,000-$4,999” and “$5,000 or more.” In the baseline survey, about half of OCM and comparison respondents reported spending less than $500 out-of-pocket and there was no statistically significant difference between OCM and comparison respondents across the six expense categories. Self-reported OOP expenses among OCM respondents increased slightly in the first two intervention survey waves, and then returned to the baseline level in the third intervention survey wave (see Appendix E), yielding no statistically significant trend from the baseline through the first three intervention waves (the comparison group will be surveyed again in Year Three).

insurance during the catastrophic benefit phase. In these analyses, Part D beneficiary costs are measured as the sum of patient pay amount and other True Out of Pocket (TrOOP) amount (does not include low income cost-sharing amounts).

[59] In 2010, approximately 86 percent of all Medicare beneficiaries had some source of supplemental coverage (https://www.kff.org/report-section/a-primer-on-medicare-what-types-of-supplemental-insurance-do-beneficiaries-have/). After removing beneficiaries with Medicare Advantage, this amounts to 82 percent of Medicare FFS beneficiaries with some type of supplemental coverage.

Exhibit 17: Estimated OCM Impact for Beneficiary Cost-Sharing 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
Cost-Sharing for all Services										
Part A Beneficiary Cost-Sharing Amount	489,710	579,678	$455	$443	$439	$436	-$9*	-$18	-$1	-2.1%
Part B Beneficiary Cost-Sharing Amount	489,710	579,678	$4,442	$4,702	$4,388	$4,680	-$31	-$87	$25	-0.7%
Part D Beneficiary Cost-Sharing Amount	393,970	471,502	$661	$735	$664	$721	$17**	$4	$30	2.6%
Cost-Sharing for Chemotherapy Drugs										
Part B Chemo Beneficiary Cost-Sharing Amount	489,710	579,678	$1,995	$2,134	$1,935	$2,105	-$31	-$99	$37	-1.6%
Part D Chemo Beneficiary Cost-Sharing Amount	393,970	471,502	$393	$471	$394	$441	$31***	$19	$43	8.0%

Source: Episode analytic file, 2014–2017.

Notes: All measures were calculated at the episode level. Part D cost-sharing overall and for chemotherapy was restricted to episodes for the subset of beneficiaries enrolled in Part D for all months of the episode. 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. Many beneficiaries had no Part A cost-sharing.

OCM: OCM intervention group; COMP: Comparison group.

Int.: Intervention period

*p≤0.10, **p≤0.05, ***p≤0.01

3.4 Program Effectiveness: Probability of Select Cost and Utilization Impacts

Summary of Findings on Probability of Impacts

Early results about total Medicare spending show promise, indicating an 85 percent probability that OCM is achieving some level of savings; however savings are not enough to cover projected payments to practices (MEOS and PBP), which are not yet incorporated in the analyses.

- The likelihood that Medicare savings totaled at least $452 or half of the possible maximum MEOS payments was less than 5 percent, and there was no chance that the savings were enough to cover the maximum possible MEOS.
- There was an 80 percent probability of any decrease in the number of inpatient stays and a 69 percent probability of any decrease in the number of ED visits, but these decreases were likely small.

We calculated probabilities for four key outcomes: TCOC per episode (not including MEOS payments), the number of inpatient hospitalizations per episode, the number of ED visits not resulting in an inpatient stay per episode, and the number of ED visits resulting in an inpatient stay per episode. These were selected for probability analysis because of their fundamental relevance to the cost and quality goals of OCM. In addition, these utilization measures may be important early indicators of the potential impacts of enhanced oncology services under OCM.

We report below the probability that each of these four measures decreased for OCM episodes, relative to changes in these outcomes for comparison episodes, between the baseline and intervention periods. Using the main DID result for each of the four measures, we estimated the probability that the impact was a particular value (e.g., fell above or below zero), and also the probability that any savings were sufficient to cover the maximum possible MEOS payments that practices could have billed.[60] More information about the estimation methodology is provided in Appendix A.

3.4.1 Probability Estimates for TCOC

In Section 3.3, we reported no statistically significant DID impact on TCOC per episode. The DID impact estimate, representing an average change in TCOC (not including MEOS payments) for OCM episodes relative to comparison episodes, was negative (-$173) and amounts to a 0.6 percent reduction in TCOC relative to average OCM baseline costs (**Exhibit 15** in Section 3.3.2). The $173 decrease in TCOC (not including MEOS) was not statistically significant at the 10 percent level.

An alternative way to look at the findings is to estimate the likelihood of observing relevant changes in key measures. The probability that TCOC decreased by *any* amount for OCM episodes (i.e., that there were savings for Medicare, without MEOS payments) was 85.1 percent (**Exhibits 18 and 19**), and the likelihood that Medicare savings (without including MEOS payments) totaled at least $100 per episode was 66.9 percent.

There was, however, zero probability that the per episode savings to Medicare were sufficient to offset the maximum possible MEOS payments. If the maximum MEOS amount had been billed by all OCM practices for PP1, these estimated costs would range from $891 to $934 per episode (depending on type of

[60] MEOS payments only apply to OCM episodes during the intervention period, not the baseline.

cancer), for an average of $904 per episode (Appendix D).[61] As shown in **Exhibits 18 and 19**, there was zero probability that the savings achieved per episode was at least the maximum possible MEOS payment per episode, and a 4.6 percent probability that the savings were enough to offset at least half of the maximum MEOS of $452.

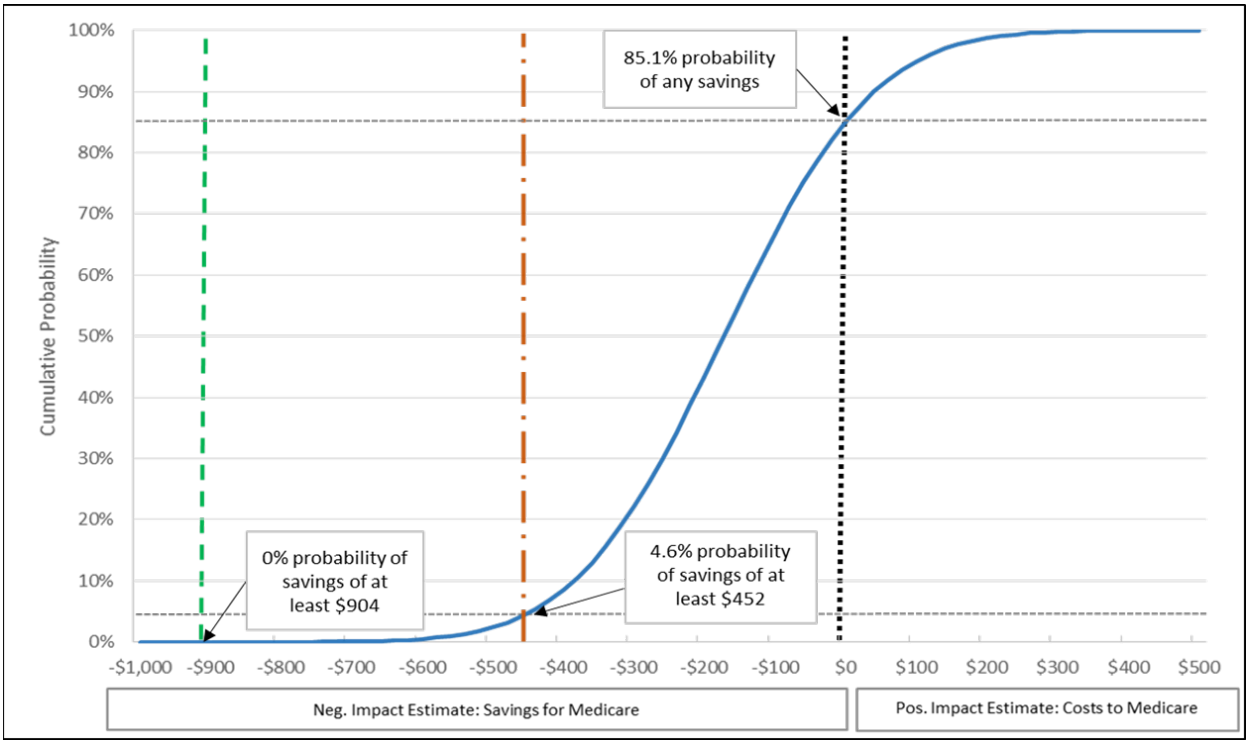
Exhibit 18: Probability Estimates for Changes in TCOC per Episode, PP1

Savings Category	Probability
Any amount of increase in costs to Medicare per episode	14.9%
Any amount of savings for Medicare per episode	85.1%
Savings of at least $100 per episode	66.9%
Savings of at least $200 per episode	43.4%
Savings of at least $300 per episode	22.1%
Savings of at least $452 to offset half of maximum MEOS per episode	4.6%
Savings of at least $904 to offset maximum MEOS per episode	0.0%

Source: Episode analytic file, 2014–2017.
Notes: TCOC excludes costs for MEOS payments billed by OCM practices. The maximum MEOS amount accounts for Medicare sequestration, hospice entry, and death.

[61] OCM practices may submit claims for a MEOS payment of $160 per month for each six-month episode attributed to the practice, for a maximum of $960 per six-month episode (less sequestration). Practices may not submit MEOS claims after a patient enters hospice or dies. The estimated maximum MEOS payments averaged less than $960 per episode because the Medicare sequestration adjustment applies to MEOS payments, and also due to hospice entry or death. The estimated maximum MEOS averaged $904, and ranged between $891 and $934 because rates of hospice entry and beneficiary death vary by cancer bundle.

Exhibit 19: Cumulative Probability Estimates for Changes in TCOC per Episode, PP1



Source: Episode analytic file, 2014–2017.

3.4.2 Probability Estimates for Inpatient and Emergency Department Utilization

In addition to the DID impact estimates above, we estimated the probability that OCM was associated with a decrease in the number of inpatient hospitalizations and ED visits among OCM episodes, relative to episodes in the comparison group, between the baseline and intervention periods. During PP1, there was an average of about 4,080 inpatient hospitalizations per 10,000 OCM episodes and an average of 6,570 ED visits per 10,000 OCM episodes.

Several recent studies indicate that as many as 20 percent of hospitalizations for cancer patients are potentially avoidable.[62,63,64] As reported in Section 3.2 above, there was no statistically significant impact of OCM on the number of inpatient hospitalizations. The DID impact estimate of -0.004 represents a reduction of 40 hospitalizations per 10,000 episodes, only a 0.9 percent reduction relative to the OCM baseline value (**Exhibit 10** in Section 3.2.1). Although the DID estimate was not statistically significant, we estimate that there was an 80 percent probability of *any* decrease in the number of inpatient hospitalizations for OCM episodes (**Exhibit 20**). This decrease was likely small. For example, the probability that the decrease represented even a two percent reduction from baseline for OCM episodes (a

62 Brooks, G. A., Abrams, T. A., & Meyerhardt, J. A., et al. (2014). Identification of potentially avoidable hospitalizations in patients with GI cancer. J Clin Oncol, 32(6), 496–503.

63 Brooks, G. A., Jacobson J. O., & Schrag D. (2015). Clinician perspectives on potentially avoidable hospitalizations in patients with cancer. JAMA Oncol, 1(1),109.

64 Meisenberg, B.R., Hahn, E., Binner, M., et al. (2016). ReCAP: Insights into the potential preventability of oncology readmissions. J Oncol Pract, 12(2),153–154; e149–156.

reduction of approximately 86 inpatient visits per 10,000 episodes) was 15.8 percent, and the probability that the decrease represented a five percent reduction (or 214 visits per 10,000 episodes) was zero.

Exhibit 20: Probability Estimates for Reductions in the Number of Inpatient Hospitalizations per Episode, PP1

Reduction in IP Hospitalizations	Number of Hospitalizations (per 10,000 Episodes) Associated with Reduction	Probability
Any reduction in the number of IP hospitalizations per episode	>0	80.0%
Reduction of at least 1%	43 or more	46.9%
Reduction of at least 2%	86 or more	15.8%
Reduction of at least 3%	128 or more	2.7%
Reduction of at least 4%	171 or more	0.2%
Reduction of at least 5%	214 or more	0.0%

Source: Episode analytic file, 2014–2017.

In Section 3.2, we similarly reported a negative but not statistically significant impact (point estimate = -0.002) on the number of ED visits that did not result in a hospitalization for OCM episodes relative to comparison episodes, which represents a reduction of 20 visits per 10,000 episodes, a 0.6 percent reduction from the average OCM baseline value. We estimate that there was a 69 percent probability of *any* decrease in the number of ED visits not resulting in a hospitalization (**Exhibit 21**). Again, this decrease was likely small. For example, the likelihood that the decrease represented a two percent reduction from baseline for OCM episodes (a reduction of approximately 70 ED visits not resulting in an inpatient stay, per 10,000 episodes) was 13.7 percent, and the probability that the decrease represented a five percent reduction (or 176 visits per 10,000 episodes) was zero.

Exhibit 21: Probability Estimates for Reductions in the Number of ED Visits Not Resulting in an Inpatient Stay per Episode, PP1

Reduction in ED Visits Not Resulting in IP Stay	Number of Visits (per 10,000 Episodes) Associated with Reduction	Probability
Any Reduction in the Number of ED Visits Not Resulting in IP Stay per Episode	>0	69.4%
Reduction of at least 1%	35 or more	38.4%
Reduction of at least 2%	70 or more	13.7%
Reduction of at least 3%	106 or more	2.9%
Reduction of at least 4%	141 or more	0.3%
Reduction of at least 5%	176 or more	0.0%

Source: Episode analytic file, 2014–2017.

The DID impact estimate indicates that OCM episodes had 0.011 fewer ED visits that resulted in hospitalization ($p \leq 0.01$), relative to comparison episodes (**Exhibit 11** in Section 3.2.1). This represents a 3.7 percent reduction from the average OCM baseline level of utilization, or 110 fewer visits per 10,000 episodes. The probability estimates show that that there was a nearly 100 percent probability of *any* decrease in ED visits resulting in an inpatient stay. (**Exhibit 22**). This is consistent with the level of statistical significance of the DID impact estimate; the probabilities of reductions in ED visits resulting in hospitalization were higher than the probabilities of reductions in ED visits not resulting in a hospitalization. For example, the likelihood of a reduction in ED visits resulting in hospitalization of at least two percent (or a decrease of 61 per 10,000 episodes) was 89.9 percent, and the likelihood of a reduction of at least five percent (or 152 per 10,000 episodes) was 16.9 percent.

Exhibit 22: Probability Estimates for Reductions in the Number of ED Visits Resulting in an Inpatient Stay per Episode, PP1

Reduction in ED Visits Resulting in IP Stay	Number of Visits (per 10,000 Episodes) Associated with Reduction	Probability
Any Reduction in the Number of ED Visits Resulting in IP Stay per Episode	>0	99.7%
Reduction of at least 2%	61 or more	89.8%
Reduction of at least 4%	122 or more	41.5%
Reduction of at least 5%	152 or more	16.9%
Reduction of at least 7%	213 or more	0.7%
Reduction of at least 10%	304 or more	0.0%

Source: Episode analytic file, 2014–2017.

3.5 Program Effectiveness: Enhanced Oncology Services

Summary of Findings on Enhanced Oncology Services

Many OCM practices were meeting some of the OCM requirements for enhanced oncology services before the Model began, and during PP1, practices continued to work to provide additional enhanced services.

24/7 Access

- Practices used a number of strategies to improve access to care for their patients.
  - Most OCM practices offered same day appointments before OCM began (95 percent). Evening and weekend clinic hours for urgent care were offered by fewer than 40 percent of OCM practices.
- Surveyed patients rated access to providers very highly for both OCM and comparison practices.

Care Plans with 13 Elements Recommended by the Institute of Medicine

- Comprehensive Care Plans were new for all 12 practices we visited in Year One, and EHR technology did not support easily compiling all necessary information.
- Most elements of Care Plans were straightforward for practices to document, but the following were more challenging: prognosis, OOP cost estimates, identifying and meeting psychosocial needs, and survivorship plans.

Core Functions of Patient Navigation

- Practices offered multiple patient navigation functions, shared among multiple staff members; some also took advantage of nurse navigators at nearby or affiliated hospitals.

Use of Evidence-Based Treatment Guidelines

- All 12 practices we visited in Year One followed clinical guidelines from the National Comprehensive Cancer Network (NCCN) prior to OCM, and used the same guidelines for OCM and non-OCM patients.
- Some practices use pathways software programs to guide oncologists' treatment decisions, but these are often not integrated with computerized order entry.
- Oncologists are permitted to deviate from guidelines and/or pathways, but practices we visited vary greatly in the extent of oversight or approval required for any deviation.

Participating OCM practices are required to offer four enhanced oncology services for patients with OCM episodes: 1) 24/7 patient access to an appropriate clinician with real-time access to the practice's medical records, 2) a Care Plan containing the 13 components in the Institute of Medicine Care Management Plan,[65] 3) core functions of patient navigation, and 4) treatment with therapies consistent with nationally

[65] CMS requires clinicians at OCM practices to develop all 13 components of the Care Plan and to document these items in the EHR. CMS encourages clinicians to share a hard copy of the Care Plan with patients, however this is not a requirement. The 13 components are: patient information (e.g., name, date of birth, medication list, and allergies), diagnosis, prognosis, treatment goals, initial plan for treatment and proposed duration, expected response to treatment, treatment benefits and harms, information on quality of life and a patient's likely experience with treatment, who will take responsibility for specific aspects of a patient's care, advance care plans, estimated total and out-of-pocket costs of cancer treatment, a plan for addressing a patient's psychosocial health needs, and a survivorship plan.

recognized clinical guidelines. CMS offers participating practices the opportunity to bill monthly MEOS payments to ensure that these enhanced services are available to meet individual patient needs. OCM also requires practices to use data for continuous quality improvement, and to use electronic health record systems (EHRs) certified by the Office of the National Coordinator of Health IT. This section presents survey, case study, and PTP findings about enhanced oncology services and other OCM programmatic requirements, as well as clinician experiences and perceptions about the impact of these changes.

3.5.1 Providing 24/7 Access to Clinicians

Prior to OCM, all 12 practices we visited in Year One were already providing 24/7 access for all patients to oncology clinicians who were able to access patients' EHRs, and patient survey responses in the Access to Care composite were not statistically different between OCM and comparison beneficiaries at baseline. Among OCM survey respondents, composite responses in the OCM Patient survey did not change statistically over time (see Appendix E). The comparison group will be surveyed again in Year Three.

Eleven of 12 practices we visited during used a nurse triage line during business hours and an answering service after hours. Triage nurses respond to patient questions directly and consult with an oncologist when necessary. After hours, answering services route patients' clinical calls to the appropriate on-call oncologist. All nurses and oncologists who take patient calls have access to the patient's EHR both during the day and via home computers and mobile devices after hours. At the time of our visit, these 11 practices were satisfied with these approaches and did not plan any changes. The twelfth practice relies on its hospital's 24-hour call-in line. This line is staffed by non-clinicians and the practice leaders were aware that oncology patients' concerns were not always addressed in a timely fashion. The practice planned to revise its triage process to route all patient calls about oncology questions and concerns directly to an on-call oncologist.

3.5.2 Care Plans

OCM practices are required to document 13 Care Plan elements in their EHRs, and CMS encourages them to share this information with patients. All 12 practices we visited in Year One recorded at least some of the 13 components in their EHRs prior to OCM, but the extent and accessibility of this information differs, and depends greatly on EHR functionality. Prior to OCM, none of the practices were completing Care Plans that captured all 13 components in a consistent manner and printing them for patients, but practices told us that completing most of the components of the Care Plan has been straightforward.

Some of the 13 Care Plan components were formatted in discrete fields in the leading EHRs of the 12 practices we visited (e.g., medication list, treatment plan, goals of therapy), but other components had no structured EHR fields. Some practices customized their EHRs to add fields for missing elements, and trained clinicians to use these new fields. Others manually extract information from oncologists' text notes. In seven of the 12 practices we visited, oncologists are responsible for improving their EHR documentation and entering formatted data rather than using text notes for important information such as prognosis, disease stage, and expected response to treatment. In the other five practices, oncologists were not asked to change their workflow and staff such as nurses, nurse practitioners, or data entry staff pull information from the oncologist's notes to complete the Care Plan. Some information, such as total and OOP costs, or pathology results for disease staging and prognosis, exist in different information systems altogether (e.g., billing, tumor registry) and may not be easily accessible or extractable.

Three of the 12 practices we visited, all independently owned, told us that they complete Care Plans for all of their patients, regardless of insurance coverage. The other nine practices focus their Care Plan efforts on OCM patients only, at least to start, although there may be some spillover in documentation for non-OCM patients. Several practices plan to create Care Plans for all their patients in the future.

Most of the Care Plan elements were straightforward for OCM practices, but the following were described by interviewees as being especially challenging:

OOP Cost Estimates for Patients. CMS asks OCM practices to document estimates of OOP cost for all cancer treatment (not limited to chemotherapy) and share this information with patients. Three of the 12 practices we visited provided some OOP cost information for patients prior to OCM, but providing comprehensive estimates of OOP costs is a new exercise for all 12. They all told us this is difficult, especially for independent practices that do not provide surgery, radiation therapy, or other services that contribute to total and OOP costs. Even practices owned by health systems that provide these other services could not determine the costs of this care until after the fact, because their billing departments do not generate estimates in advance. The multiple inputs for cost calculations (treatment regimen, cost of drugs not dispensed/infused by the practice, imaging, lab tests, secondary insurance) make such computations complex, labor-intensive, and prone to error. Ten of the 12 practices told us that they estimate OOP costs only for the drugs prescribed for the initial treatment regimen, and lab tests performed in the office; they do not estimate OOP costs for imaging, radiology, surgery, or other services patients receive elsewhere.

One health system-owned practice we visited tries to include all cancer-related costs (or a range of costs) by diagnosis, based on its own cost/billing experience with oncology patients, but acknowledged this is inaccurate for services provided outside its own health system. One independent practice provides the OOP cost estimate after the first chemotherapy cycle, when they have a better sense of the exact cost of the patient's medications and supportive therapies.

Although most interviewees agreed that OOP cost information helps patients with financial planning, several raised concerns about providing even an estimate up front that may eventually prove to be incorrect. Response to treatment may be suboptimal, requiring additional lines of therapy, for example, and this cannot be known in advance. A few practices address this by updating OOP estimates with each change in treatment.

Prognosis and Treatment Intent/Goals. Many oncologists we interviewed are wary about specifying prognosis at the start of treatment. They told us that prognosis for many cancers and treatments is imprecise and poorly understood by patients, and a poor initial prognosis can affect patient morale (and possibly adherence to treatment). Many also told us that response to treatment is unpredictable and they feel it is best to address prognosis as disease and treatment progress. Five of the 12 practices we visited worked with their oncologists to define and implement standard definitions of prognosis. For example, one categorizes prognosis as "fair" or "good," while another defines prognosis as treatment intent of "cure" versus "living longer with my disease." The other seven practices allow oncologists to define prognosis in whatever way they prefer, and share this information with patients whenever they think best. While the oncologists we interviewed in OCM practices generally know that documenting prognosis is an OCM requirement, practices do not necessarily monitor whether oncologists share this information with patients.

Identifying and Meeting Psychosocial Needs. Systematic screening for psychosocial needs is new under OCM for four of the 12 practices we visited. Three of these practices instituted standardized screening for depression after the start of OCM, and one started screening for both depression and distress. The other eight practices were informally assessing patients' emotional and psychosocial needs before OCM, but now use standardized screening tools to make this process more systematic and routine. Some of the independent practices raised concerns that the screeners are identifying needs that they are unable to meet for many patients, due to financial barriers or inadequate community-based resources (e.g., no transportation services in rural areas). A few independent practices compiled lists of community resources, such as transportation, that they offer to patients with needs identified through the new screening process. Health system-owned practices described having have more resources to meet patient psychosocial needs, and the oncology team frequently refers patients to the health system's social workers, dieticians, and other resources. Some independent practices that are located adjacent to a local hospital also refer patients to the hospital's social workers and dieticians for support. Two of the independent practices considered hiring social workers for OCM, but decided the level of need among their patients (as revealed by screening) does not justify the expense; a third hired social workers for the first time, to work exclusively with OCM patients.

Survivorship Plans. One of the 13 Care Plan components is a survivorship plan, summarizing the treatment received and a schedule for follow-up/surveillance after treatment is complete. Five of the 12 practices we visited created survivorship plans for their patients prior to OCM, and were improving these—for example, creating standard follow-up plans for each type and stage of cancer, or incorporating the survivorship plan into the EHR instead of using a paper document. Written survivorship plans for patients are entirely new for the other seven practices we visited, to meet OCM requirements. Three OCM practices added new survivorship "clinics," usually staffed by a nurse practitioner, to see patients for surveillance follow-up (e.g., routine scans) in the years following successful treatment. In these practices, the impetus for adding the survivorship clinic was to reduce follow-up sessions with oncologists, who would then have more time in their schedules for new patients. Two practices routinely send survivorship plans to patients' primary care providers at the end of treatment, and others encourage patients to share the paper survivorship plan with their other providers.

3.5.3 Core Functions of Patient Navigation

OCM requires practices to provide the core functions of patient navigation. At the time of our case study visits, all 12 practices offered some patient navigation functions, even if they did not have designated "navigators."[66] In their 2017 PTPs, participating practices reported how frequently they use each of 11 core patient navigation activities to meet patient needs.[67] Of the 11 core patient navigation activities, 10

[66] Although OCM practices are required to offer the functions of patient navigation, practices do not need to have designated patient navigators.

[67] The PTP Plans ask about: 1) coordinating appointments with clinicians inside and outside the practice to ensure timely delivery of diagnostic and treatment services, 2) maintaining communication with patients and their families across the care continuum, 3) ensuring that appropriate medical records are available at scheduled appointments, 4) arranging language translation or interpretation services, 5) facilitating connections to follow-up services, 6) providing access to clinical trials, 7) building partnerships with local agencies and groups (e.g., referrals to other services and/or cancer survivor support groups), 8) facilitating financial support (e.g., counseling, or payments from foundations or drug companies), 9) arranging transportation, 10) arranging child or elder care, 11) helping with paper work (e.g., living wills, financial support forms).

were offered to all or nearly all patients who needed them (as far as the practices were aware of the need). Twenty-five percent of OCM practices reported on the PTP that they consistently arrange child care or elder care for patients having that need. Larger practices were more likely than smaller practices to arrange language translation or interpretation services ($p<0.05$) for patients with this need, and hospital- or health system-owned practices were more likely than independent practices to arrange transportation for patients who need it ($p<0.05$). Practices with academic affiliation were less likely than non-academic practices to report that they coordinate appointments with outside clinicians, ensure that appropriate medical records are available at appointments, or assist patients with locating financial support ($p<0.05$ for all three). In 2017, more practices reported coordinating appointments with clinicians inside and outside the practice than in 2016 (75 percent in 2016 vs. 85 percent in 2017, $p<0.05$) but there were no other significant changes reported over Year One.

Exhibit 23 summarizes how each of the 12 practices we visited approaches the OCM requirement for patient navigation. Several practices rely at least in part on nurse navigators (e.g., breast cancer navigators) at an affiliated or neighboring hospital where the patient had initial surgery. This is most common for patients undergoing multi-modal treatment (radiation, surgery, chemotherapy) because they have complicated treatment scheduling. Practice staff assist other patients who do not qualify for the hospital navigators' services.

Two independent practices increased their patient navigation/care coordination staff for OCM. One very large practice hired dozens of care coordinators who work remotely and follow their assigned patients throughout treatment—proactively calling to follow up on any specific issues noted by the oncologists, helping with navigation, and linking patients to other resources as needed. A second very large independent practice hired its first four nurse navigators for OCM, who rotate among the practices' many clinics, meeting new patients in person whenever possible and following them with telephone check-ins.

Clinical and non-clinical staff share navigation functions at most practices we visited. For example, administrative staff follow the prescribed regimen to schedule lab work and chemotherapy sessions, and help patients schedule appointments outside the practice, such as for radiation treatment. Oncologists or nurses may refer patients to other support services (e.g., social workers, dieticians, transportation support, and support groups) available in an affiliated health system or in the community. Several practices employ patient advocates/financial counselors to focus on financial and insurance counseling and assistance. At some practices, the patient advocates also arrange for translators during appointments, and refer patients to non-clinical community resources (transportation, support groups, etc.). One medium-sized practice has a cadre of cancer survivors who volunteer as peer navigators, spending time with patients in the infusion room and telling them about community resources.

Exhibit 23: Use of Patient Navigators

Practice Visited	Ownership	Size	Employs Dedicated Navigators	Refers Patients to Hospital Navigators
Year 1A	Health system-owned	Large	✓	
Year 1B	Health system-owned	Very large	✓	
Year 1C	Independent	Medium		✓
Year 1D	Independent	Medium	✓	
Year 1E	Independent	Small		✓
Year 1F	Independent	Medium		✓
Year 1G	Health system-owned	Small		✓
Year 1H	Independent	Medium	✓	✓
Year 1I	Health system-owned	Medium	✓	
Year 1J	Independent	Very large	✓	
Year 1K	Independent	Very large	✓	
Year 1L	Independent	Small	✓	

3.5.4 Use of Evidence-Based Treatment Guidelines

OCM requires evidence-based care, which in turn may encourage greater attention to standardization, and increased monitoring of deviation from guidelines. This section explores the use of guidelines, regimens, and order sets programmed in EHRs; use of pathways software programs; and how these may be changing in response to OCM incentives.

All 12 practices we visited in Year One follow clinical guidelines from the National Comprehensive Cancer Network (NCCN) or the American Society of Clinical Oncology (ASCO), and use the same guidelines for OCM and non-OCM patients. Most practices have a process through which oncologists review new published literature and national guidelines and reach consensus about the preferred regimens they agree to use. The preferred or recommended regimens are sometimes compiled into a paper or web-based document, and in all but one practice the regimens are programmed into order sets in the EHR. Four of the 12 practices regularly review and remove obsolete regimens and order sets. Two others recently "cleaned house" and discarded obsolete regimens, prompted at least in part by OCM participation. Six practices currently use pathway software programs to guide oncologists toward the best-value regimen. The six others use standard regimens based on guidelines, but do not employ pathways software. Of these, two independent practices were considering purchasing pathways software programs in the coming year. In their annual PTPs, the proportion of practices reporting electronic clinical decision support integrated with the EHR increased substantially, from 38 percent of practices in 2016 to 66 percent of practices in 2017 ($p<0.01$).

The number of regimens adopted by practices varies widely and does not seem to correlate with practice size. The smallest practice we visited was building over 300 regimens into its new EHR; conversely, a medium-sized practice we visited has distilled a concise set of standard regimens for each cancer type and stage, and these are programmed into the EHR and printed in an easy-reference pocket-size "booklet" for oncologists.

In all 12 practices we visited, oncologists are permitted to deviate from the care pathway or preferred regimen if they consult with colleagues, cite published literature demonstrating the efficacy of the

alternative regimen, and note the deviation in the EHR. The practices vary considerably in the extent of oversight or approval required for any deviation. The smallest of the 12 practices, which has over 300 treatment regimens and no pathways software, has no process for reviewing—much less approving—deviations. A medium-sized practice that also does not use pathways software emphasizes oncologists' autonomy and has no formal process for reviewing or approving deviations. The medium-sized practice with the pocket reference booklet described above requires prior approval from its medical director before an oncologist prescribes a regimen that deviates materially from the standard regimen. Practices with care pathways software appear to discourage deviation from guidelines more than those without pathways, and one oncologist at such a practice emphasized that "it is very difficult to deviate from the [programmed] pathways."

None of the 12 practices we visited select their treatment regimens based explicitly on cost, and oncologists have no ability to compare the actual cost of alternative drug regimens before prescribing. Leaders at three practices told us that they support inclusion of cost considerations when oncologists are prescribing (e.g., generics), but the oncologists we interviewed in these practices did not all agree. Leaders at three practices told us about strategies to raise oncologists' awareness of lower cost treatment options. The pharmacist at one practice reviews drug costs regularly and suggests alternatives to oncologists if the drugs they order are not more effective than lower-cost options. One practice implemented a clinical pathways software program after the start of OCM that prioritizes lower-cost drugs of equivalent efficacy, and another uses a similar program that rank orders equally efficacious regimens according to cost (lowest to highest). None of the practices we visited that use pathways software programs reported that they had evidence yet that these programs were affecting prescribing patterns or drug costs.

Section 3.6.3 below describes the impact of OCM on adherence to guidelines for prophylactic antiemetic supportive therapy.

3.5.5 Certified EHRs and Using Data for Continuous Quality Improvement (CQI)

All the OCM practices we visited in Year One adopted certified EHRs prior to the start of OCM. Several were planning upgrades and improvements in information technology, and considered OCM requirements in making these decisions.

OCM practices are required to use data (e.g., clinical EHR data, CMS feedback reports, claims data, patient surveys) for continuous quality improvement. Practices report progress toward meeting this requirement in their annual PTPs, and we asked about this during case studies.

In their 2017 PTPs, over three quarters of practices reported reviewing data about quality of care, utilization, and patient-reported experiences on at least a quarterly basis. Hospital- or health system-owned practices were more likely than independent practices to review data on patient-reported care experiences on at least a quarterly basis (85 percent vs. 73 percent, $p<0.05$), perhaps reflecting their greater resources for surveying patients.

Many of the 12 practices we visited repurposed CQI processes from previous initiatives (e.g., Meaningful Use, PQRS). As shown in **Exhibit 24**, some practices regularly provide feedback to individual oncologists about their performance, while others review performance data at the practice level but do not share individual physician-level data. The larger practices tend to have more-robust CQI activities, with staff dedicated to collecting and analyzing performance data and developing data-driven improvement

initiatives. In two of the four health system-owned practices we visited, the health system assigned performance improvement staff to spend at least a portion of their time supporting OCM.

Exhibit 24: Types and Uses of Performance Data among 12 Case Study Practices

Type of Data Reviewed	Number of Practices Employing Approach*	Who Reviews	Notes
Review practice-level performance metrics	11	• 7 practices share with oncologists to discuss improvement strategies • 4 practices share only with practice executives to discuss improvement strategies	• The twelfth practice visited had not yet begun reviewing these data at the time of the visit, but planned to begin using an OCM Analytics module they purchased from their new EHR vendor.
Review physician-level performance metrics	10	• 6 practices share performance metrics with individual oncologists • 3 practices share only patient satisfaction survey (e.g., Press Ganey) results with individual oncologists • 2 practices share performance metrics only with practice executives to discuss improvement strategies	• One practice is considering tying oncologist performance metrics to their physician compensation model.
Participate in the Quality Oncology Practice Initiative (QOPI)	4		• Practices noted that participation in QOPI informed their performance monitoring for OCM; however, some indicated limited utility of QOPI metrics because OCM uses different measures.

* Total is more than 12 since some practices implement more than one approach.

3.5.6 Provider Experiences and Satisfaction

Staff in a number of practices we visited stated that OCM has added new tasks to their workflow—for example, medical assistants in at least one practice administer the distress screener—but also feel strongly that these new tasks improve quality of care by helping to ensure that patient needs are identified and promptly addressed. New tasks, such as making proactive outreach calls to high-risk patients, take time, but several nurses told us that they feel enhanced job satisfaction in identifying and meeting patients' needs early. In at least one practice, clinicians told us that proactive outreach to high-risk patients reduces call volume to the on-call oncologist at night and on the weekend, improving physician satisfaction (and rest).

During Year One case studies, several oncologists expressed concern that increasing documentation, especially recording information in structured EHR fields rather than free text notes, is time-consuming and reduces the time they spend with patients. A few mentioned that increased documentation requirements could also lead to oncologist and staff dissatisfaction and burnout. While OCM is not the only factor contributing to documentation burden, oncologists in several practices mentioned completing and documenting Care Plan components (an OCM requirement) as new and burdensome.

Lack of adequate EHR tools for creating Care Plans and software systems that do not interoperate affect provider burden and satisfaction. Even advanced EHRs do not fully support OCM requirements, and awkward work-arounds are common. For example, standardizing treatment regimens and adhering to national guidelines has prompted several practices to adopt clinical pathways software programs that are not integrated with their EHRs. In this circumstances, oncologists use two separate systems: one to identify the correct pathway, and the other to select the order set that matches the pathway. For another example, none of the oncology EHRs are designed to automatically extract the 13 Care Plan components and assemble them into a single document, without additional work by practice staff.

We will conduct a comprehensive clinician survey in Year Three to measure satisfaction with OCM and perceived impact of the Model.

3.6 Program Effectiveness: Quality

Summary of Findings on Quality

The intervention and comparison groups were well matched at baseline on most measures of patient-reported quality, and there is not yet a measurable impact of OCM on quality. There is early indication of less aggressive care at the end of life for OCM patients.

- Surveyed cancer patients were highly satisfied with their cancer teams and care before OCM began, and ongoing surveys of OCM beneficiaries did not identify any significant changes.
- There are some early indications of less aggressive care at the end of life for beneficiaries served by OCM practices, compared to those served by non-participating practices, including fewer inpatient admissions and ICU stays in the last month of life.
- OCM practices are working to improve patient education, follow evidence-based guidelines, and proactively managing chemotherapy symptoms such as nausea and dehydration, all with the goal of avoiding unnecessary ED visits and costly hospitalizations.

This section of the report presents findings about overall patient ratings and experiences with care coordination, communication, access, and shared decision making, all important components of overall quality from the patient's perspective. This section also presents findings about quality of supportive care and EOL care.

3.6.1 Overall Patient Ratings of Their Cancer Therapy Team

The OCM patient survey asks respondents for an overall rating of their cancer therapy team on a scale of 0 (worst cancer therapy team possible) to 10 (best cancer therapy team possible). In the baseline, there was no statistically significant difference in overall rating between OCM and comparison respondents (see Appendix E). Both OCM and comparison respondents gave their cancer therapy team very high marks (approximately 9.3 out of 10), and among the OCM group there was little room to improve and no statistically significant change over time. This suggests that OCM did not improve or impair overall patient ratings of their cancer care team.

3.6.2 Care Coordination and Communication

This section explores care coordination and communication processes that may be affected by OCM, as well as practices' efforts to comply with OCM requirements. Overall, practices we visited told us that activities related to coordination were of high priority, although they experience challenges in receiving

timely notification when their patients visit EDs. Overall, both OCM and comparison survey respondents gave their care teams high ratings for care coordination.

Care Coordination

In their 2017 PTPs, OCM practices report on several activities related to care coordination, and the patient survey includes three questions about care coordination.[68] Additionally, the 12 practices we visited during Year One were all exploring how to make better use of their EHRs to coordinate care.

The percentage of practices reporting use of care coordination approaches in 2017 in the PTP ranged from 61 percent of all OCM practices conducting medication reconciliation with outside clinicians, to 93 percent of practices conducting medication reconciliation with patients during care transitions. No variation in care coordination activities was observed by practice size, ownership, or academic affiliation, and no significant differences between the first and second PTPs.

There was no statistically significant difference between OCM and comparison survey respondents to the baseline survey, on any of the three care coordination measures. Both OCM and comparison practices were rated highly by their patients on care coordination (see Appendix E). At baseline, approximately 90 percent of both OCM and comparison respondents reported that their cancer therapy team never delayed treatment due to missing tests or reports, and that they never received conflicting information about care from different members of their cancer therapy team. Seventy-two percent of both OCM and comparison respondents reported their cancer therapy team always knew important information about their medical history.

Over time, fewer OCM respondents reported that their cancer therapy team always knew the important information about their medical history, a decline from 71.9 percent in the baseline wave to 67.8 percent in the intervention wave 3 ($p \leq 0.05$). This decline was more pronounced among OCM respondents who were treated with long-term hormonal therapy only, without other chemotherapy—patients who have infrequent contact with their oncology care team. For breast cancer patients with hormonal therapy only, the rate declined from 70.9 percent in the baseline to 63.1 percent in the intervention wave 3 ($p \leq 0.10$). For prostate cancer patients with hormonal therapy only, the rate declined from 68.0 percent in the baseline to 59.7 percent in the intervention wave 3 ($p \leq 0.10$). There was no statistically significant trend in the other two care coordination measures among OCM survey respondents. We will continue to monitor this downward trend in the OCM group over time, and in Year Three will determine whether the same decline occurred among comparison respondents.

Data collected during case studies focused mainly on the ability of the practice to utilize EHRs to improve documentation and communication across health care providers, and the practices' ability to obtain notifications when patients are receiving care outside of their practice. Three of the 12 practices we visited transitioned to new or upgraded EHRs during the early months of the Model and considered OCM requirements when making the change/upgrade. Two practices purchased their EHR vendor's OCM module as an add-on. While these EHR enhancements may help practices implement and monitor key

[68] These three measures are (1) how often the cancer therapy team seemed to know important information about the patient's medical history, (2) how often the cancer therapy team delayed the patient's treatment or a treatment decision due to missing test results or reports from other providers, and (3) how often patients received conflicting information from different members of the cancer therapy team.

components of OCM, they do not necessarily contain additional features that help facilitate coordination with entities outside the practice.

Oncologists want to know as soon as possible when their patients receive care elsewhere, especially if patients visit an ED or are admitted to the hospital, as this may alter the treatment plan going forward. Two practices we visited are owned by integrated health systems that use enterprise EHRs, which means that all of the care a patient receives, anywhere in the health system, exists in a single record that can be accessed by oncologists and nurses. This is not the case at the other two health system-owned practices, where the practice and its parent health system have different EHRs. Oncologists at these two practices, like those at the eight independent practices, have some capability to view portions of their patients' records in the affiliated hospitals' EHRs, but the reverse is usually not possible. That is, a hospital's EHR may have a provider portal through which the oncologist can view portions of a patient's hospital record, but the practice's oncology EHR has no similar portal through which hospital staff (and other external physicians) can view the patient's oncology record.

Real-time notification when a patient visits the ED could help oncologists communicate with ED physicians, reduce unnecessary tests performed in the ED, and potentially avert inpatient admissions, but many oncologists only learn about ED visits from the patient. Health Information Exchanges (HIEs) offer the possibility of better coordination between oncology practices and nearby hospitals, but HIE utility is only as good as the extent of membership and timeliness of information sharing. One health system-owned practice we visited participates in the local HIE and is notified whenever one of its patients is seen at any other local hospital that is also in the HIE, but not all local hospitals are HIE members. Another practice we visited receives a report from the regional HIE every 12 hours about ED visits by any of its patients, which is helpful but usually not timely enough for oncologists to intervene before a patient is admitted from the ED to the hospital. A third practice is in the process of joining its state HIE, to which most hospitals belong. After this is complete, nurse navigators at the practice will be notified in real time if one of their patients is in an ED, and can work with ED staff to avert an inpatient admission. This practice told us it is costly to link its EHR to the HIE, and it will take 18 months to complete the necessary contracting and IT connections.

Patient-Provider Communication

In their 2017 PTPs, most OCM practices reported that they offer online patient portals and on-call clinicians to facilitate communication between patients and their oncology team. Of the different composites on the patient survey that assess patient-provider communication, composite scores were highest for affective communication and lowest for shared decision making. There were no statistically significant differences at baseline between intervention and comparison groups on these composites, and no changes in the OCM group over time.

In their annual PTPs, practices indicated how they use technology to facilitate patient-provider communication. Nearly 95 percent of practices use an EHR patient portal, and 11 percent of practices offer two-way, real-time, video visits. Use of these technologies did not vary by practice size, ownership, or academic affiliation and did not change between 2016 and 2017.

Telephone access is described in Section 3.5, and every practice we visited includes 24/7 telephonic access to a clinician who can access the patient's electronic record. Leaders at several practices we visited in Year One mentioned that they are implementing and/or enhancing tools for communicating with their patients, at least in part to succeed in OCM. All 12 practices we visited installed EHR patient portals prior

to OCM through which patients can securely message their care teams and review posted test results. Of the 12 practices, six now give patients copies of their Care Plans and upload the document to the patient portal. One independent practice invested in new software that sends automated text message reminders to patients about appointments, and adherence reminders for oral chemotherapy. In the future, this practice intends to use the software to identify patients experiencing adverse side effects and proactively engage with them to improve symptom management.

Communication technologies and strategies, along with enhanced navigation and care coordination, may improve patient experiences of communicating with their oncology care teams. Other OCM requirements enumerated in the Care Plans (see Section 3.5.2) are intended to ensure that patients understand their treatment plan and goals of therapy, to support shared decision making and advance care planning. The patient survey includes many questions about communication between patients and providers, in three domains: Affective Communication, Exchanging Information, and Shared Decision Making. We created one composite for each domain.

Over the three intervention waves, the adjusted mean composite scores for Affective Communication and Exchanging Information were very high, and declined slightly among OCM respondents (**Exhibit 25**), from 9.01 in the baseline to 8.92 in the intervention wave 3 ($p \leq 0.01$) for Affective Communication, and from 8.51 to 8.41 for Exchanging Information ($p \leq 0.05$). We will survey comparison patients again in Year 3 to understand whether these declines were present in comparators as well.

We note that the magnitude of identified changes over time was quite small, and that the reason for statistical significance is primarily the large sample size of our survey. These small changes may not be clinically meaningful or related to overall patient ratings of care, which remained unchanged over time (see Section 3.6.1).

Exhibit 25: Adjusted Measures on Patient-Provider Communication, by OCM Patient Survey Wave (OCM Respondents Only)

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
Affective Communication							
Composite score: affective communication (on a scale of 0–10)	9.01	8.96	8.93	8.92	-0.03***	-0.04	-0.01
Cancer therapy team always showed respect for what patient had to say	81.1%	79.4%	79.0%	80.1%	-0.4%	-0.9%	0.1%
Cancer therapy team always listened carefully to the patient	79.0%	77.9%	78.5%	78.5%	-0.1%	-0.4%	0.2%
Cancer therapy team was always direct and straightforward when talking with patient about cancer and drug therapy	77.5%	76.1%	74.2%	75.0%	-1.0%**	-1.6%	-0.3%
Cancer therapy team always spent enough time with the patient	72.7%	71.9%	70.3%	70.5%	-0.8%***	-1.3%	-0.3%
Exchanging Information							
Composite score: exchanging information (on a scale of 0–10)	8.51	8.42	8.38	8.41	-0.04**	-0.06	-0.01
Cancer therapy team definitely clearly explained how drug treatment could affect the patient's normal daily activities	74.3%	72.8%	74.7%	72.6%	-0.3%	-0.8%	0.1%
Cancer therapy team definitely told patient what the next steps in drug therapy would be	69.4%	68.4%	65.8%	68.4%	-0.6%*	-1.1%	-0.1%
Cancer therapy team always explained test results in a way that was easy to understand	75.5%	74.2%	74.0%	74.5%	-0.3%	-0.8%	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)	88.6%	89.2%	88.3%	90.2%	0.4%	-0.5%	1.3%
Shared Decision Making							
Composite score: shared decision making (on a scale of 0–10)	7.45	7.38	7.31	7.44	-0.01	-0.04	0.02
Cancer therapy team definitely talked with patient about the reasons patient might want to have drug therapy	85.7%	85.5%	84.7%	84.2%	-0.5%*	-1.0%	-0.04%
Cancer therapy team definitely talked with patient about the reasons patient might not want to have drug therapy	44.9%	41.7%	41.5%	44.0%	-0.3%	-0.9%	0.2%

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
Cancer therapy team definitely asked for patient's opinion about whether or not to have drug therapy	61.3%	60.9%	60.9%	62.7%	0.4%	-0.2%	1.0%
Cancer therapy team definitely involved patient in decisions about drug therapy as much as the patient wanted	74.8%	74.1%	72.8%	75.3%	-0.0002%	-0.3%	0.3%

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

3.6.3 Quality of Supportive Care

An important aspect of cancer care is effective supportive care to address symptoms related to cancer and its treatment. Improving supportive care may help to improve patient experiences and reduce preventable ED visits and hospitalizations.[69] OCM practices we visited are working to improve symptom management for their patients, through proactive outreach to high-risk patients to assess symptoms, urgent/same-day appointments to address symptoms (including on weekends), and educating patients about seeking care from the oncology practice rather than in EDs. In addition, the OCM requirement to follow evidence-based guidelines may lead practices to adhere more closely to guidelines for prophylactic antiemetic supportive therapy, to prevent nausea and vomiting due to toxic chemotherapy. This section describes changes practices are implementing to better support patients undergoing chemotherapy, adherence to evidence-based guidelines for antiemetic therapy, patient-reported experiences receiving assistance managing symptoms from cancer and chemotherapy, and chemotherapy-related hospitalizations and ED visits.

Practice Efforts to Identify High-risk Patients

Some chemotherapeutic regimens are especially toxic, and patients require additional support to tolerate side effects and complete treatment. All 12 practices we visited in Year One acknowledged the benefit of identifying high-risk patients for proactive outreach and symptom management, although not all were using standard processes to categorize risk, or recording patient risk status in their EHRs. Three practices instituted formal tools to identify high-risk patients: one records practice-calculated risk scores in the EHR, the other two maintain separate lists of high-risk patients because their EHRs have no field to record this information. At the time of our visit, only one of these three practices was systematically acting on the information about risk status, by using its list to review specific patient needs in weekly OCM care coordination huddles. Three other practices hoped to add risk assessment functionality within their new EHRs or with a separate tool, but had not yet implemented this at the time of our visit. In the remaining six practices, clinical staff told us that they identify high-risk patients in an ad hoc fashion based on patient characteristics (e.g., age, caregiver support needed), treatment regimen, psychosocial

[69] https://www.fredhutch.org/en/news/releases/2017/many-cancer-patients-emergency-department-visits-appear-preventable.html; accessed on March 5, 2018.

factors, comorbidities, or other factors identified from "knowing our patients." Having identified such patients in these practices, however, follow-up is sporadic and not standardized across the practice.

The annual PTPs ask about use of risk scores/risk cohorts to target patients for proactive outreach and enhanced supportive care. The percent of OCM practices stratifying patients into actionable risk cohorts increased from 30 percent in 2016 to 46 percent in 2017 ($p<0.05$).

Side effects from chemotherapy can cause patients to skip doses of oral medication, sometimes without communicating with their oncology care team. Better communication about side effects, and assistance in managing those side effects, may improve patient adherence to the prescribed medication/schedule. Several practices told us they proactively contact patients on oral therapies to monitor adherence and check for side effects. Nurses at three practices told us that as a direct result of OCM they now routinely call oral therapy patients, especially those taking more-toxic or costly medications, to monitor adherence. Pharmacy technicians do the same at a fourth very large independent practice, but this began before OCM. A fifth practice planned to start oral adherence calls soon after our visit. One practice purchased software that will generate text reminders to patients about adhering to the schedule for their oral medications.

Guideline-Recommended Use of Prophylactic Antiemetics for Patients Undergoing Intravenous Chemotherapy

The incentive to deliver high-value care under OCM could lead practices to systematically reduce overuse of costly antiemetic drugs (which prevent nausea and vomiting), in situations where similarly effective and less expensive alternatives are available. Conversely, the incentive to prevent costly ED visits and hospitalizations could lead practices to adopt more high-intensity antiemetic regimens, administered prior to toxic chemotherapy, with the goal of reducing acute care utilization.

Rates of guideline-recommended antiemetic use in the baseline period were similar for OCM and comparison practices, although OCM practices had a slightly higher rate of guideline-recommended antiemetic use for patients on high emetogenic risk chemotherapy regimens (75.4 percent vs. 72.2 percent, see **Exhibit 26**). There was no DID estimated OCM impact on use of guideline-recommended antiemetics for any emetogenic risk group, for episodes that began during PP1, although the rate increased for both groups.

Among patients who received guideline-recommended chemotherapy, we assessed the extent to which patients received higher-intensity (and more costly) versus appropriate lower-intensity regimens that might be a suitable first strategy for patients starting chemotherapy. There was no significant OCM impact on the intensity of antiemetics used, among the guideline-recommended antiemetic regimens (**Exhibit 27**).

Exhibit 26: Guideline Recommended Use of Antiemetics

Measure	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Guideline-Recommended Use of Antiemetics										
High emetogenic risk episodes	6,620	8,235	75.4%	81.1%	72.2%	78.4%	-1.6%	-4.8%	1.6%	-2.2%
Moderate emetogenic risk episodes	41,301	47,846	96.6%	96.0%	96.5%	95.9%	0.8%	-0.2%	1.7%	0.8%
Low emetogenic risk episodes	35,946	42,400	85.3%	87.0%	86.9%	88.5%	-0.6%	-2.3%	1.1%	-0.7%

Source: Episode analytic file (2014–2017).
Notes: OCM: OCM intervention group; COMP: Comparison group. Int.: Intervention period

Exhibit 27: Use of Higher versus Lower-Intensity Guideline-Recommended Antiemetic Regimens

Measure	# of Episodes		OCM		COMP		Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Use of Antiemetics										
Moderate emetogenic risk episodes with high-intensity antiemetic patterns	40,019	45,943	24.3%	29.4%	23.1%	28.0%	0.1%	-2.8%	2.9%	0.3%
Low emetogenic risk episodes with high-intensity antiemetic patterns	30,637	37,202	37.8%	33.9%	38.3%	34.4%	1.6%	0.0%	3.2%	4.2%

Source: Episode analytic file (2014–2017).
Notes: OCM: OCM intervention group; COMP: Comparison group. Int.: Intervention period

Patient-Reported Symptom Management

Efforts by OCM practices to better support patients during chemotherapy (e.g., prophylactic antiemetic therapy, expanded clinic hours, same-day appointments) may improve patient-reported care experiences, especially symptom management. In their 2017 PTPs, OCM practices reported offering same day appointments (95 percent), and extended evening clinic hours (38 percent) or weekend hours (36 percent).

The OCM patient survey contains multiple questions about patients' experiences communicating with their care providers about symptoms related to cancer and treatment, and receiving assistance to manage those symptoms.

We created two composite scores to measure symptom management. The first—the Enabling Patient Self-Management—is one of the five composites used to adjust the performance-based payments that practices may be eligible to receive and contains eight questions, including:

- Questions about whether patients talked with their cancer therapy team about three symptoms related to cancer and chemotherapy, including pain, changes in energy levels, and emotional problems such as anxiety or depression
- Questions about whether the cancer therapy team tried to help patients deal with those symptoms, if patient experienced them
- Questions about whether the cancer therapy team provided additional services to help patients, including additional services to manage cancer care at home, such as home health care, special medical equipment, or special supplies; and things patient can do for themselves to maintain health during cancer treatment, such as diet and exercise.

There was no difference between intervention and comparison survey respondents in the baseline survey on the composite score for Enabling Patient Self-Management, which was 6 out of a possible 10 in both groups. This suggests that our comparison group resembled the OCM group before the Model began and in both groups, practices have room to improve.

The second composite—Symptom Management—contains questions about whether the cancer therapy team tried to help patients deal with eight symptoms, if the patient experienced any of those symptoms. The Symptom Management composite is important to measure whether practices' symptom management efforts are improving patient experiences. The eight symptoms include the three symptoms that are also in the Enabling Patient Self-Management composite (pain, changes in energy levels, and emotional problems), as well as five additional symptoms that clinical experts advise are especially relevant for chemotherapy patients: nausea/vomiting, difficulty breathing, coughing, constipation/diarrhea, and neuropathy. The Symptom Management composite is not used to adjust PBP payments. There was no baseline difference between intervention and comparison survey respondents in the composite score for Symptom Management (7.4 out of 10 in both groups).

We surveyed OCM patients in three intervention survey waves during Model Year One (comparison patients will be surveyed again in Year Three). There was no statistically significant trend over time in either composite score related to symptom management (**Exhibit 28**). There were, however, a few trends over time in the OCM group for individual survey questions within the composites dealing with emotional problems, definitely talking about things the patient could do to maintain health during cancer treatments, and talking about additional services to manage care at home.

Exhibit 28: Adjusted Measures on Symptom Control, by OCM Patient Survey Wave (OCM Respondents Only)

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
Composite Score							
Composite score: enabling patient self-management (on a scale of 0–10)	5.96	5.86	5.99	5.96	0.01	-0.02	0.04
Composite score: symptom management (on a scale of 0–10)	7.29	7.14	7.32	7.28	0.01	-0.02	0.05
Individual Question: Talked about Symptoms							
Cancer therapy team talked with patient about pain related to cancer or chemotherapy or hormonal therapy	71.1%	69.5%	70.3%	69.6%	-0.4%	-1.2%	0.4%
Cancer therapy team talked with patient about changes in energy levels related to cancer or chemotherapy or hormonal therapy	78.7%	77.8%	79.6%	77.6%	-0.2%	-0.6%	0.3%
Cancer therapy team talked with patient about emotional problems related to cancer or chemotherapy or hormonal therapy	53.7%	54.2%	54.8%	54.6%	0.3%	-0.1%	0.7%
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)	74.7%	74.1%	74.2%	75.8%	0.3%	-0.4%	1.1%
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)	52.4%	48.9%	49.5%	51.3%	-0.3%	-0.9%	0.3%
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)	44.2%	45.5%	45.9%	48.9%	1.5%*	0.2%	2.7%
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)	80.4%	79.4%	77.9%	79.4%	-0.5%	-1.0%	0.1%

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
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)	58.2%	55.7%	59.0%	56.9%	-0.1%	-0.8%	0.6%
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)	48.5%	56.9%	53.6%	53.6%	1.3%	-0.2%	2.8%
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)	66.5%	63.7%	68.8%	68.8%	1.1%	-0.1%	2.3%
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)	49.1%	46.8%	47.6%	45.9%	-0.9%	-1.9%	0.1%
Individual Question: Talked about Other Services							
Cancer therapy team definitely talked with patient about additional services to manage care at home	22.0%	21.6%	22.2%	20.1%	-0.5%**	-0.9%	-0.1%
Cancer therapy team definitely talked with patient about things patient can do to maintain health during cancer treatment	47.1%	46.4%	47.5%	49.9%	0.9%**	0.2%	1.6%

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

Chemotherapy-Related Hospitalizations and Emergency Department Visits

Improved symptom management, expanded clinic hours, better communication with high-risk patients, and appropriate use of supportive medications, may together reduce ED visits and hospitalizations related to toxic side effects of chemotherapy. In the baseline period, 7.8 percent of OCM episodes had at least one chemotherapy-associated hospitalization and 11.6 percent had associated ED visits; these chemotherapy-related visits represent a small proportion of total hospitalization and ED visits (see Section 3.2.1). In comparison episodes, 7.3 percent had at least one chemotherapy-associated inpatient hospitalization and 11.6 percent had associated ED visits. The proportion of episodes with chemotherapy-associated hospitalizations and chemotherapy-associated ED visits decreased in both groups during PP1, and the estimated OCM impact was not statistically different (**Exhibit 29**).

Exhibit 29: Chemotherapy-Associated Hospitalizations and ED Visits

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 inpatient admission	489,710	579,678	7.8%	7.1%	7.3%	6.6%	0.1%	-0.2%	0.3%	0.9%
Episodes with chemotherapy-associated ED visit	489,710	579,678	11.6%	11.0%	11.4%	11.0%	-0.2%	-0.4%	0.1%	-1.5%

Source: Episode analytic file 2014–2017.
Notes: Some of the patients who had ED visits were admitted to the hospital, and are also recorded in the chemotherapy-associated inpatient visits. ED visits that do and do not result in an inpatient admission are presented separately in Appendix F.
OCM: OCM intervention group; COMP: Comparison group. Int.: Intervention period

Combining information above about supportive therapy from all of the analyses presented in this section, we see that in the first year, OCM practices were working to identify high-risk patients, improve access to urgent care, and improve supportive therapy, all with the goal of reducing ED visits and subsequent hospitalizations, especially those for chemotherapy toxicities. These improvements may require expanding space, hiring more staff, and other structural changes that are especially challenging for hospital-based practices, and where possible, may take more than one year to complete. Antiemetic therapy for patients undergoing emetogenic infused chemotherapy did not change in the OCM group relative to comparisons, and there was no OCM impact on chemotherapy-related ED visits or hospitalizations. We will continue to monitor changes in these key indicators of supportive therapy, as well as relative impact in patient-reported symptom management between OCM and comparison survey respondents.

3.6.4 Quality of End-of-Life (EOL) Care

OCM emphasizes advance care planning and incentivizes appropriate EOL care. This section explores issues related to the provision of end-of-life care for cancer patients.

When patients are terminally ill and further curative treatment is futile and may reduce quality of life, holistic care shifts to prioritizing pain management and symptom palliation. EOL care can be overseen by oncologists and often also involves other care providers such as palliative care specialists and hospice providers. The incorporation of palliative care for patients who may benefit, and the careful management of patients during transitions to hospice, are important elements of high quality EOL care.

OCM contains specific requirements and feedback to practices that are intended to improve advance care planning, care coordination, and EOL care. Eliminating ineffective, unnecessary, and often costly treatments at the end of life may improve quality of life and reduce TCOC for dying patients, while improving caregiver experiences with EOL care. This section of the report addresses advance care planning and palliative care, treatment at the end of life, hospice care, and caregiver ratings of EOL care.

Advance Care Planning and Palliative Care

OCM explicitly encourages advance care planning and it is one of the 13 Care Plan elements. Studies demonstrate that patients with documented advance directives (e.g., living wills) are less likely to receive health care interventions near to death.[70, 71]

Practice leaders we interviewed during case studies generally embraced the idea of early discussions with patients for advance care planning. Most of the 12 practices mentioned efforts to improve their process for promoting early discussions and completing some form of advance care directive with their patients. Non-oncologist clinical staff, such as medical assistants, nurses, social workers, and advanced practice clinicians, may introduce the topic of advance care planning with patients; however, most practices rely on oncologists to hold detailed discussions about EOL planning.

Most oncologists we interviewed acknowledged that discussions about advance care planning can be difficult, especially when patients first enter treatment that they hope will be curative. Many emphasized that OCM provides an impetus to begin these discussions sooner, and some told us they use OCM as the justification to introduce advance care planning with their patients. Two practices we visited in the early months of OCM planned to offer more training to their oncologists about discussing advance directives and goals with patients. Some practices also use vetted tools and programs for advance care planning (e.g., Honoring Choices, Five Wishes, and Physician Order for Life-Sustaining Treatment [POLST] forms). Several oncologists at one practice that serves minority and immigrant communities told us they do not discuss palliative care or advance care planning until the patient or family asks, because in the past they felt that such discussions irreparably "broke the trust relationship" with patients from some cultures. At other practices we visited, the oncologists discuss advance directives with many of their patients at the start of treatment and revisit these plans as disease progresses. One physician who has practiced for more than 30 years explained that he no longer waits until a patient has advanced disease: he has learned that early and repeated conversations make this topic a routine part of giving and receiving cancer care, for which he credits OCM.

While most OCM practices encourage their patients to complete advance directives earlier in treatment, several noted the challenge of sharing these directives with patients' other providers. Even if a copy of the advance directive is available in the practice's EHR, it is not easily accessible to outside providers, such as emergency room physicians. Oncologists at several practices acknowledged that it is usually up to patients and their caregivers to bring a copy of the advance directive when seeking care at an ED.

---

[70] Teno, J. M., Gruneir, A., Schwartz, Z., et al. (2007). Association between advance directives and quality of end-of-life care: a national study. J Am Geriatr Soc, 55:189.

[71] Brinkman-Stoppelenburg, A., Rietjens, J.A., & van der Heide, A. (2014). The effects of advance care planning on end-of-life care: a systematic review. Palliat Med, 28:1000.

All 12 practices we visited in Year One expressed keen interest in using more palliative care services. We observed differences in palliative care services offered at the practices owned by health systems versus those owned by independent practices, as summarized in **Exhibit 30**. At six independent practices, palliative care is provided by the oncologists (not by palliative care specialists), but two are exploring hiring palliative care specialists. The two other independent practices and the four health system-owned practices rely on palliative care specialists. Two practices added palliative care specialists specifically for OCM, two practices hope to add such services in the future, and two others are planning to expand existing palliative care services.

Exhibit 30: Palliative Care Services Offered

Strategy	Independent Practices	Health System-Owned Practices	Challenges	Planned Changes
Palliative care provided by oncologists at the practice	6			• Two of these six practices plan to hire palliative care specialists
Palliative care provided by specialists on staff (or contracted) at the practice	2	2	• Most palliative care specialists' salaries exceed what payers will reimburse for palliative care consultations; however, the service is still considered worthwhile from the practices' perspective as it improves oncologist productivity.	
Patients have access to palliative care specialists at hospital (generally inpatient only)		2	• Hospital palliative care specialists see mainly inpatients, and have limited time in their schedule for outpatient consultations.	• Expand palliative care services at the practice; offer symptom management earlier in treatment • One practice hopes to provide space within the practice for the health system's palliative care specialist to see outpatients

Care at the End of Life

Multiple prior studies found that timely hospice referral, avoidance of medical interventions at the end of life, and death outside the hospital, reflect better quality of care and higher satisfaction as perceived by family members and caregivers.[72] For example, previous research indicates that among Medicare patients with advanced-stage lung or colorectal cancer, receiving more than three days of hospice care, dying outside of the hospital, and having no ICU admission within 30 days of death, were associated with "excellent" family-reported ratings of EOL care. ICU admissions and greater use of medical care at the end of life were also associated with a lower rating of respectful and communicative care, and increased rates of depression among caregivers. Additionally, research finds that patients who died in a hospital or ICU experienced more physical and emotional distress at the end of life than did patients who died in a hospice. We measured several features of EOL care using claims, and validated these outcomes with proxy survey responses in Appendix F. Finally, while we assess all information available in Medicare claims regarding episodes for OCM and their comparators, it is important to keep in mind that chemotherapy triggers OCM-defined episodes. EOL care that discourages chemotherapy may keep episodes from being triggered, potentially altering the composition of the OCM group and DID results over time. The findings below are therefore likely a conservative estimate of the impact of OCM on care at the end of life. In the future, we will follow patients for additional months after their last OCM-defined episode ends, to include subsequent deaths in EOL analyses.

[72] Ersek, M., Miller, S. C., Wagner, T. H., Thorpe, 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., et al. (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., et al. (2016). Family perspectives on aggressive cancer care near the end of life. Journal of the American Medical Association, 315(3), 284–292.

Wright, A. A., Keating, N. L., Balboni, T. A., et al. (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., e al. (2014). Associations between palliative chemotherapy and adult cancer patients' end of life care and place of death: prospective cohort study. BMJ, 348, g1219.

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

Exhibit 31 shows that for patients who died during an OCM-defined episode, inpatient admissions and ICU use in the last 30 days of the patient's life decreased among OCM episodes relative to comparable comparison episodes.

- The share of OCM episodes with any inpatient admission in the last 30 days of a patient's life decreased while the share of comparison episodes with any inpatient admission in the last 30 days of a patient's life increased ($p \leq 0.01$) resulting in a statistically significant relative decrease of 1.5 percentage points for OCM episodes relative to comparisons, a decline of 2.6 percent of the mean OCM inpatient admission rate in the baseline period.
- The share of OCM episodes for deceased patients that included at least one ICU stay in the last 30 days of the patient's life increased slightly in the first PP, but comparison episodes increased more, ($p \leq 0.01$), resulting in a statistically significant relative decrease of 2.2 percentage points for OCM, an 8.1 percent decline relative to the mean OCM value in the baseline period.
- There was no statistically significant change in receipt of any chemotherapy during the last 14 days of life or ED use (two or more visits) in the last 30 days of life, during OCM episodes when the patient died, relative to comparison episodes.

We conclude that the OCM emphasis on advance care planning may be contributing to the estimated reductions in inpatient and ICU admissions for dying OCM patients, relative to the comparison group.

Caregiver Perceptions of EOL Care Quality

The vast majority of proxy (i.e., caregiver) survey respondents gave high ratings for the overall care their deceased loved one received in the last month of life. Proxy respondents overwhelmingly rated deceased patients' overall experiences in the last month of life as "excellent," [73] "very good," or "good," for both OCM patients and comparison patients (approximately 90 percent).[74] However, this was not equally true for individual questions about EOL care experiences. For example, while more than 70 percent of proxy survey respondents indicated that care providers always showed respect for what the dying patient had to say, only about half of proxy respondents reported that care providers always spent enough time with the dying patient.

[73] Forty-six percent of the proxies selected the highest rating (excellent) for the dying patient's overall care experience in the last month of life, for both OCM patients and comparison patients.

[74] The proxy-reported overall rating varied considerably based on patients' care preferences. Among proxies of patients who died in the baseline period, just before OCM began, 91.6 percent rated the overall experience as "excellent," "very good," or "good" if the dying patient preferred to relieve pain as much as possible, compared with 86.0 percent for dying patients who preferred to extend life as long as possible ($p \leq 0.01$). A smaller pre-OCM difference (91.5% vs. 87.6%; $p \leq 0.01$) was indicated by proxy respondents for deceased comparison patients.

Exhibit 31: Impact Estimates for Hospital-Based Care and Chemotherapy at the End of Life

Measure	Number of Episodes		OCM		COMP		Cumulative Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Any chemotherapy during the last 14 days of life	51,243	57,394	13.0%	13.2%	12.2%	12.4%	0.003	-0.004	0.010	2.4%
Any inpatient admissions in the last 30 days of life	51,243	57,394	55.7%	55.4%	54.3%	55.4%	-0.015***	-0.026	-0.003	-2.6%
Any Intensive Care Unit (ICU) use in the last 30 days of life	51,243	57,376	26.6%	27.0%	22.6%	25.0%	-0.022***	-0.033	-0.010	-8.1%
Emergency Department (ED) use (2+ visits) in the last 30 days of life	51,243	57,394	15.3%	16.5%	15.4%	17.1%	-0.007	-0.015	0.001	-4.4%

Source: Episode analytic file, 2014–2017.
Note: OCM: OCM intervention group; COMP: Comparison group. Int.: Intervention period
*p≤0.10, **p≤0.05, ***p≤0.01

Exhibit 32 shows risk-adjusted EOL care experiences as reported by proxy survey respondents during the baseline period prior to OCM, separately for OCM patients and comparison patients. In the baseline survey, the majority of proxy respondents reported that OCM and comparison patients who died wished to relieve pain and discomfort as much as possible, rather than extending life as long as possible.[75] Proxies for deceased OCM patients were statistically less likely to report that providers followed the deceased patient's wishes in the last month life "a great deal," than were proxies for deceased comparison patients (80.4 percent OCM vs. 83.0 percent comparison; $p \leq 0.10$).[76] There was no statistically significant difference in any other proxy-reported care experience measures between the OCM and deceased comparison groups in the baseline survey.

Exhibit 32: Adjusted Measures on Proxy-reported EOL Care Experience, OCM Survey Baseline Wave (Apr.–Sep. 16)

Measure	Number of Respondents		Adjusted Mean		Difference in Adjusted Mean		
						90% CLs	
	OCM	COMP	OCM	COMP	Diff.	LCL	UCL
The patient's overall experience in the last month of life was excellent/very good/good	2,121	1,709	90.4%	90.0%	0.3%	-1.4%	2.1%
Care providers always showed respect for what the patient had to say	2,096	1,681	72.8%	71.9%	0.9%	-1.8%	3.6%
Care providers always listened carefully to the patients	2,094	1,663	67.8%	67.0%	0.8%	-1.9%	3.6%
Care providers were always direct and straightforward when talking with the patient	2,070	1,650	61.0%	60.2%	0.8%	-2.1%	3.7%
Care providers always explained things in a way the patient could understand	2,066	1,646	61.8%	60.5%	1.3%	-1.3%	4.0%
Care providers always spent enough time with the patient	2,084	1,672	53.7%	52.8%	0.9%	-1.9%	3.7%
The patient never got conflicting information about care from different care providers	2,008	1,608	77.8%	77.5%	0.3%	-1.9%	2.5%
Care providers followed the patient's wishes to a great extent	1,857	1,506	80.4%	83.0%	-2.6%*	-4.9%	-0.3%

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

There was no statistically significant change in any proxy-reported EOL care experience from the baseline wave to the first three intervention waves for OCM patients.

[75] In the baseline survey wave, there was no statistical difference between OCM and comparison patients with regard to wishing to relieve pain and discomfort versus extending life as long as possible.

[76] This difference was most pronounced for deceased patients who were between 75 and 84 years old. In this age group, proxies for 78.8 percent of deceased OCM patients indicated that the patient's wishes were followed by providers "a great deal," compared with 84.9 percent among deceased comparison patients ($p \leq 0.01$).

Hospice Utilization and Caregiver Perceptions about Hospice Timing

Transition to hospice care at a clinically useful point in the patient's disease trajectory is an important goal of high quality EOL care. Cancer patients whose life is unlikely to last more than six months, may elect the Medicare hospice benefit. As noted, receiving more than three days of hospice care was perceived by caregivers as better EOL care than was very brief use of hospice prior to death.[77]

Oncologists at all 12 practices we visited told us that they refer patients to hospice as needed, drawing on a short list of preferred hospice agencies, while acknowledging that patients choose which hospice to use. Four practices told us that they excelled in appropriate and timely use of hospice services prior to implementing OCM. Others were just starting to re-educate clinicians and improve relationships with hospice agencies; at the time of our visits, two practices had begun such education for their staff. Most oncologists at the independent practices we visited remain actively involved in their patients' care after hospice referral, serving as the "physician of record" and writing prescriptions for pain medication, oxygen, and other symptom management orders. In contrast, oncologists at the four health system-owned practices told us that they generally transfer responsibility to the hospice medical director and have no further contact with the patient.

Exhibit 33 shows that there was no statistically significant impact of OCM on any claims-based measures of hospital utilization or the timing of hospice entry/election. In both the baseline and intervention periods, OCM patients were slightly more likely to use hospice services than were comparison patients. However, OCM patients were also slightly more likely to enter a hospice only one or two days before death, which for many patients is too short to optimize comfort measures.

Since hospice entry typically requires documentation from a physician attesting that the patient is unlikely to live more than six months beyond referral, a discussion about hospice care is the first step toward hospice entry. The OCM patient survey asks proxy respondents for deceased patients whether providers discussed hospice care with the dying patient. If providers did discuss hospice care with the patient, the survey asks whether the deceased patient used hospice care and whether hospice care started at the right time (or started too early or too late). While responses from OCM and comparison proxy respondents were quite similar at baseline, hospice use varied considerably, depending on patients' preferences for care in the last month of life. Among deceased OCM patients in the baseline survey, 90.0 percent of those who preferred to relieve pain as much as possible received hospice care (according to their caregiver proxy respondents), compared with 78.7 percent of those who preferred to extend life as long as possible. A similar difference was reported by proxy respondents for deceased comparison patients (88.2% vs. 80.2% respectively). Among patients who received hospice care, most proxy survey respondents felt that it began at the right time, but this was slightly less true for OCM patients than for comparisons (80.1% OCM vs. 83.6% comparison; $p \leq 0.05$). Further, proxy respondents for deceased OCM patients were more likely to report that patients started hospice care too late than was true of proxies for deceased comparison patients (18.4% vs. 15.7%, $p \leq 0.10$). We conclude that despite adjustment for observable differences, the two groups differed before OCM began, at least as reported by proxy survey respondents, and there was more room to improve in timely hospice care for OCM patients.

---

[77] Kris, A. E., Cherlin, E. J., Prigerson, H., et al. (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., et al. (2016). Family perspectives on aggressive cancer care near the end of life. Journal of the American Medical Association, 315(3), 284–292.

Exhibit 33: Impact Estimates for Hospice Use Measures

Measure	Number of Episodes		OCM		COMP		Cumulative Impact Estimates			
	OCM	COMP	Baseline Mean	Int. Mean	Baseline Mean	Int. Mean	DID	90% LCL	90% UCL	Percent Change
Never admitted to hospice	51,243	57,394	32.8%	32.4%	35.0%	35.2%	-0.003	-0.015	0.008	-0.9%
Being on hospice 1–2 days before death	51,243	57,394	8.0%	8.7%	7.1%	7.4%	0.001	-0.005	0.008	1.8%
Hospice 3–180 days before death	51,243	57,394	57.8%	57.4%	56.3%	55.7%	0.001	-0.011	0.013	0.1%

Source: Episode analytic file, 2014–2017.
Note: OCM: OCM intervention group; COMP: Comparison group. Int.: Intervention period

The proportion of proxies who reported that providers discussed hospice increased over time among OCM patients who died (**Exhibit 34**), a statically significant trend ($p \leq 0.05$). Increased discussion about hospice care did not, however, translate into a greater use of hospice care, or earlier hospice entry, neither of which changed significantly for the OCM group over the early intervention survey waves.

Exhibit 34: Adjusted Measures on Proxy-reported Hospice Use, by OCM Patient Survey Wave (OCM Respondents Only)

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
Cancer therapy team discussed hospice care with the patient or family	82.4%	79.3%	83.2%	86.8%	1.6%**	0.4%	2.9%
The patient received hospice care	84.2%	82.1%	84.9%	84.9%	0.5%	-0.8%	1.8%
The patient started hospice at the right time	77.8%	80.1%	74.2%	75.7%	-1.2%	-3.0%	0.6%

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

Place of Death

The OCM survey asks proxy respondents about the deceased patients' actual and preferred place of death, and we use these two responses to determine whether a patient died where they wished to die. In the baseline survey, 81 percent of deceased OCM and comparison patients preferred to die at home or a relative's home, as opposed to institutional facilities such as hospitals, inpatient hospice facilities, or nursing facilities (**Exhibit 35**). In both groups, only about half of the deceased patients actually died at home or at a relative's home, and this was less true for OCM patients than for comparison patients (51.6% OCM vs. 54.8% comparison; $p \leq 0.10$).

Exhibit 35: Adjusted Measures on Proxy-reported Place of Death, OCM Patient Survey Baseline Wave (Apr.–Sep. 2016)

Measure	Number of Respondents		Adjusted Mean		Difference in Adjusted Mean		
						90% CLs	
	OCM	COMP	OCM	COMP	Diff.	LCL	UCL
The deceased patient died at his/her home or relative's home (as opposed to institutional facilities)	2,139	1,707	51.6%	54.8%	-3.3%*	-6.2%	-0.3%
The deceased patient's preferred place of death is his/her home or relative's home (as opposed to institutional facilities)	1,916	1,537	81.7%	81.3%	0.4%	-2.0%	2.7%
The patient died at his/her preferred place of death (i.e., patient's preferred place of death was the same as the place where patient actually died)	1,896	1,518	73.5%	76.4%	-2.9%*	-5.6%	-0.2%

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

There was no statistically significant trend over time in the share of OCM patients who died at home or a relative's home, who preferred to die at home or at a relative's home, or who died at their preferred place of death, according to the proxies who responded to the survey. (**Exhibit 36**). The share of OCM patients who died in a hospital decreased from 22.0 percent in the baseline period to 20.7 percent in PP1. In contrast, the share of comparison patients who died in the hospital increased from 22.5 percent to 22.9 percent in the same period. The result is a statistically significant ($p \leq 0.05$) estimated change of 1.4 percentage points (or a 6.4% decrease relative to the mean OCM rate in the baseline).

Exhibit 36: Adjusted Measures on Proxy-reported Place of Death, by OCM Patient Survey Wave (OCM Respondents Only)

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	UCL
The patient died at his/her home or relative's home (as opposed to institutional facilities)	48.7%	44.3%	45.6%	52.8%	1.3%	-0.2%	2.8%
The deceased patient's preferred place of death is his/her home or relative's home (as opposed to institutional facilities)	76.9%	79.5%	76.2%	81.3%	1.0%	-0.5%	2.5%
The patient died at his/her preferred place of death (i.e., patient's preferred place of death was the same as the place where patient actually died)	75.0%	67.9%	71.8%	76.5%	0.8%	-0.6%	2.2%

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

Combining information from the results above provides a robust picture of EOL care and early impacts of OCM. First, based on analysis of Medicare claims, OCM appears to have reduced some hospital-based care at the end of life, relative to comparisons (i.e., inpatient admissions, ICU stays at the end of life), which reflects the more appropriate EOL care that OCM encourages. For both of these measures, the relative change was due to higher rates of hospital-based care over time in the comparison group, not lower rates over time in the OCM group.

Second, in the baseline survey, proxy respondents for deceased OCM patients were less likely to report that hospice care started "at the right time" than were proxy respondents for deceased comparison patients. There is some evidence that, over time, OCM practices are discussing hospice care with dying patients more, but this has not yet resulted in greater use of hospice care or improved timing of hospice entry.

In terms of place of death, our surveys indicate that most patients do not want to die in hospitals or other institutional settings, but there was no change over time in OCM patients dying where they prefer.

3.7 Secondary Outcomes: Other Payers' Experiences

Summary of Findings on Secondary Outcomes

Seventeen private payers partnered with CMS, and each signed a Memorandum of Understanding with CMS indicating intent to implement oncology models similar to OCM to decrease variation in oncology service requirements and financial incentives for practices participating in OCM.

- Private payers aligned more closely with the CMS approach for monthly payments to support enhanced oncology services than they did for calculation of PBPs, but there was considerable variation in both monthly payments and PBP calculations.
- Private payers expressed great interest in using OCM to implement or expand oncology value-based purchasing. While their models were similar, they deviated from OCM in many respects mainly due to administrative and technical challenges.

Other Payers Participating in OCM

CMS invited other payers to institute value-based payment models aligned with OCM for their covered populations served by OCM practices. CMS's goals in including other payers were to reduce burden on practices by having more payers use similar cost and quality models, and to increase leverage on practices to make changes consistent with such programs. This section describes the payment models used by other payers participating in OCM and the degree to which these align with OCM.

During the OCM PP1, 17 payers signed an OCM Memorandum of Understanding (MOU) with CMS and were developing oncology APMs aligned with OCM.[78] One withdrew soon after the Model began. We reviewed the applications and implementation updates from the remaining 16 payers and interviewed them in January and February 2017. Below we describe the models these payers implemented, or were in the process of developing, at that time.

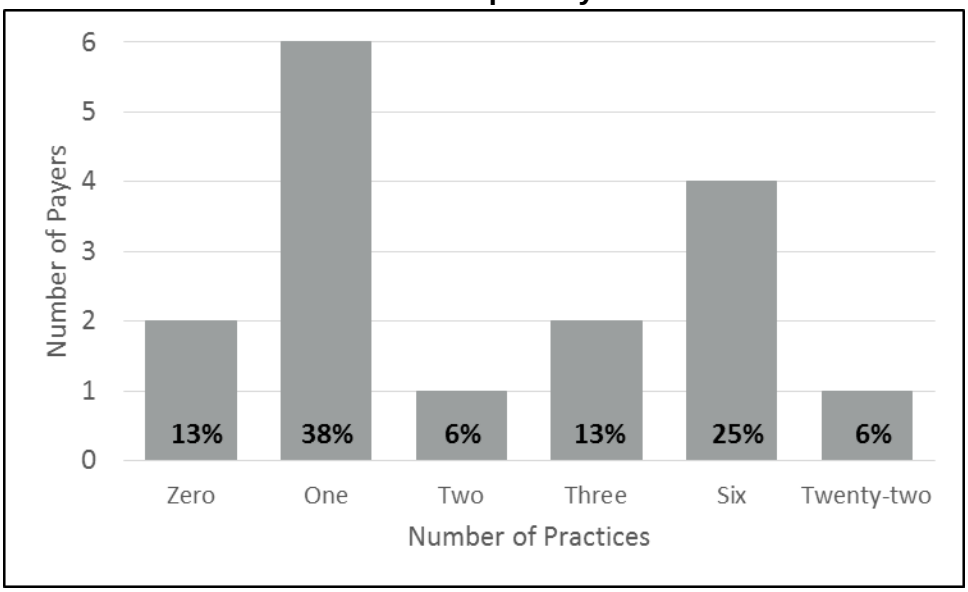
Payers and Practices

As of early 2017, two of the 16 payers had not yet enrolled any OCM practices to implement their models, at the time of our interview. Three payers owned by a single corporate entity intended to apply one consistent model, which was in development at the time of our interview. In the meantime, one of the three continued its previous oncology alternative payment model (APM). The other two payers did not plan to engage practices until the corporate model was complete.

Thirteen of the 16 payers had enrolled 1–6 OCM practices, as of February 2017; six had enrolled one OCM practice, and three had enrolled two or three practices (**Exhibit 37**). One payer had enrolled 22 practices.

[78] Oncology APM is defined here as a model developed by a payer in order to participate in OCM, which does not necessarily replicate all aspects of the OCM methodology. This section does not address any oncology models that payers implemented prior to OCM, or outside of their OCM agreement with CMS.

Exhibit 37: Number of Practices per Payer



Source: Interviewers with Other Payers, January–February 2017.

Fifty-one OCM practices were working with at least one of the 16 payers, as of February 2017. Forty of the 51 practices (78 percent) were each working with one OCM payer. Nine practices (18 percent) were working with two OCM payers, and two practices (4 percent) were working with three OCM payers.

Nine of the payers we interviewed were able to estimate the volume of patients seeking treatment at participating OCM practices. Eight of those nine payers expected to have 100 to 300 patients covered under their oncology APMs in any given month, while the ninth estimated 1,300 patients in its one OCM practice. The small size of the populations in OCM practices covered by each payer's oncology APM raised numerous challenges for creating stable benchmarks and measuring changes in episode total costs of care (described below).

Lines of Business and Cancer Bundles in Oncology APMs

Eleven of the 16 payers (69 percent) included Medicare Advantage (MA) plans in their oncology APMs. One Medicaid managed care plan focused on MA beneficiaries eligible for both Medicare and Medicaid. Five payers (31 percent) implemented an oncology APM in their MA plans only, and three implemented an oncology APM in their commercial products only.

Each year the 16 payers are asked to complete Implementation Updates for CMS, specifying whether they include the following six cancers in their OCM-aligned oncology APMs: breast, colon, lung, pancreatic/liver, prostate, and lymphoma/ hematologic malignancies. We focused on the same six cancers in our interviews. Seven of the 16 payers (44 percent) told us they include all of the six cancers, while four payers (25 percent) include three or fewer of these cancers. Breast and lung cancer are each included by 13 of the 16 payers (81 percent), followed by colorectal and prostate cancer each included by 11 payers (69 percent). Nine payers (56 percent) include cancers other than the six CMS asked about; of these, two include all cancers that CMS includes in OCM, and one includes all cancers without exception.

Practice Requirements

Practices participating in OCM must offer enhanced oncology services and meet other requirements for the provision of oncology services to FFS Medicare beneficiaries. CMS asks payers participating in OCM to align their participation requirements with CMS's. Three payers told us they assume that if a practice is implementing a service or activity for Medicare, they are doing it for all patients. This assumption may be reasonable for technological changes, such as using a certified EHR technology, but not necessarily for services or activities that require changes in staffing (e.g., patient navigators) or workflow (e.g., development and documentation of Care Plans). Two payers had no prior experience using national oncology guidelines prior to OCM, and one of these implemented a clinical pathways tool specifically for its OCM-aligned oncology APM. Most payers also intend to require documentation of Care Plans and use of a certified EHR system. Nine payers (56 percent) told us they plan to require that practices provide patient navigation services, and 10 (63 percent) will require that patients have 24/7 access to providers who have access to patients' medical records. Two payers plan audits to ensure that practices meet all requirements.

Feedback to Support Practice Transformation

In order to guide and assess progress, practices need information about their performance. Many of the payers we interviewed provide feedback to practices in their oncology APMs about cost and utilization, and, in some cases, offer more granular data. Ten of the 16 payers (63 percent) offer monthly or quarterly feedback reports. Two payers (13 percent) do not give practices feedback reports about cost and utilization, but they do provide claims so practices can calculate their own metrics. The measures payers include in their feedback reports to practices range considerably, and the definitions used for a single measure also vary. For example, various payers report ED visits to practices as:

- Number of ED visits during a time period
- Cost of ED visits during a time period
- Rate of ED visits per patient during a time period
- Rate of ED visits per "cancer-month" (defined by the payer as a month in which a patient is receiving treatment for cancer)
- List of OCM patients with an ED visit in the previous month.

Payment Approaches

Payers align more closely with the CMS approach for monthly payments to support enhanced oncology services, than they do for calculation of PBPs.

All the payers we interviewed designed oncology APMs with different definitions of eligible patients and/or episodes. At least one described episode triggering and attribution as a single step: when a new cancer patient is identified, the responsible practice is also specified, and there is no retrospective attribution based on the plurality of E&M visits. Two payers (13 percent) use a claims-based approach for identifying eligible patient episodes, while 12 (75 percent) ask the practice to identify episodes for the patients they serve. Nine payers (56 percent) include receipt of hormonal therapy as an episode trigger, but the other seven do not.

The OCM methodology triggers a new episode if a patient continues to receive cancer treatment after a six-month episode ends, and episodes can run consecutively without limit. Two of the 11 payers with six-

month episodes allow a maximum of two consecutive episodes (i.e., they offer MEOS payments for a maximum of 12 months), and the others negotiated alternative arrangements to pay practices for care coordination and other enhanced services, including:

- Monthly payments at two levels with no maximum number of months
  - Higher payment in the first month to cover initial care coordination
  - Lower payment after the first month, for as long as the patient is receiving chemotherapy
- Monthly payments at three levels
  - Higher payment in the first month to cover initial care coordination
  - Lower payment after the first month, for as long as the patient is receiving chemotherapy
  - After the patient completes chemotherapy, payment for active monitoring in months during which the patient receives at least one in-person oncology service
- One-time payment for new chemotherapy patients and/or new palliative care patients, to cover up to 12 months of care management, with negotiated amounts varying across practices
- One-time payment for each new chemotherapy patient
- "Periodic and regular," but not monthly, payment for each chemotherapy patient
- No MEOS payment—the payer provides "enhanced" generic chemotherapy payments rewarding the use of generics rather than brand name medications[79]; the additional payments, which are available to all practices (not only OCM practices), average approximately the amount of the CMS MEOS payment
- Supplemental payment of $10 per patient for an Advanced Directive discussion

MEOS payment amounts also vary widely among the 16 payers. Five payers (31 percent) offer $160 MEOS payments; one of these also offers a higher first-month payment. One payer disclosed a MEOS amount that is less than $160, and others consider their MEOS amounts to be proprietary.

Many payers were still developing their approach to PBPs at the time of our interview (Jan.–Feb. 2017), and payers described many challenges including small practice sample sizes, data systems that are difficult or expensive to change, overburdened or inexperienced payer analytic teams, and lack of timely data from practices. A few payers with full PBP methodologies described how they calculated total episode cost targets. This included:

- Paying practices for meeting utilization targets (decreasing inpatient hospitalizations and ED visits)
- Aggregating data from multiple practices to set a cost target
- Using data from the practice's first year implementing OCM, rather than historic data, to set a cost target

Payers described a variety of comparators against which they measure a practice's performance, including quality benchmarks, comparison with the payer's other practices, and comparisons with historic patterns for both the practice and peer practices. Some payers had difficulty developing models that could adjust

[79] We did not ask the other payers whether they encourage the use of generics through payment mechanisms, but it is a common strategy in the industry.

for population risk, and described unstable estimates produced by small sample sizes (i.e., small practices).

Other Themes from Payer Interviews

Payers expressed great interest in and support for oncology value-based purchasing and enhanced oncology services, and were using the OCM to make important changes. Their models did not currently follow the OCM in many respects, mainly due to administrative and technical challenges, such as the following:

- Many practices have such low patient volume that payers cannot produce stable cost estimates over reasonable time periods.
- Small payers are challenged by the complexities of OCM. One small payer explained that "We don't have dedicated FTEs to manage this, so wanted to keep it extremely simple in terms of administration [so we pay] a one-time care management fee."
- Payers negotiate their oncology APM separately with each practice in their network, and many mentioned negotiations as a factor in program design or delay.
- Payers had a variety of pre-existing non-APM plans, some specific to oncology, which made it difficult to align with CMS's OCM methodology. For example:
  - One payer excluded employer group (commercial) business to avoid renegotiating each individual client's contract.
  - One payer had a wide variety of payment arrangements for pharmaceuticals—and a large self-insured population without pharmacy benefits—and decided that including oral chemotherapy and hormonal therapies was too complex.
  - One payer calculated medical and pharmaceutical costs separately to determine PBPs because many of its members do not have a pharmacy benefit.

Having an existing oncology medical home or other APM gave a payer valuable experience, and facilitated development of OCM-aligned models, but changing legacy systems and approaches can be challenging for payers and confusing for practices. For example, a payer that had reconciliation approaches in its existing APM kept the same approach because "Providers are used to it and … we had the infrastructure in place." Another explained that "This is our first stab at a specialty value-based program so from the outset we tried to align it with our [other APM] in terms of our scoring logic."

In 2018 and 2020 we will re-interview active OCM payers, to understand any changes in their models and impacts they've measured on patient outcomes and costs.

4. Conclusion

OCM and comparison practices were well matched in the baseline period, and trends in the two groups were consistent in the years prior to OCM. The two groups changed during PP1, reflecting changes in the national oncology field. Industry consolidation resulted in more OCM and comparison practices being affiliated with hospitals or health systems, and use of immunotherapies and oral (Part D) therapies increased in response to FDA approval of new drugs. These changes were similar in both groups and there was no evidence that OCM restricted adoption of important advances in cancer treatment.

The intervention and comparison groups were also well matched at baseline on most measures of patient-reported quality. There was no consistent pattern of change for the OCM group during Year One, and no indication that OCM either impaired or enhanced patient-reported care experiences.

During this early phase of OCM, all hospital utilization measures declined more for OCM practices than for comparison practices, and two declines, although small, were statistically significant: inpatient hospitalizations that included ICU stays, and ED visits. This consistent pattern may be an early signal of reduced use of costly hospital services in response to OCM financial incentives.

OCM most likely resulted in slightly lower TCOC (i.e., savings for Medicare, without including MEOS payments or PBPs), but there was no chance that these savings were sufficient to cover the maximum possible MEOS payments that OCM practices could have submitted. The Model includes PBPs to practices achieving savings relative to a benchmark and these costs will be factored into analyses when PBP payments are finalized.

In the first year of OCM, care process redesign focused on improving supportive care, patient education, and navigation services, with the goal of reducing ED visits and subsequent hospitalizations. Although all 12 OCM practices we visited in Year One described deliberate efforts to improve supportive care, there was not yet a measurable impact on ED visits or hospitalizations for complications from chemotherapy.

OCM requires—and provides financial support for—specific enhanced oncology services. OCM practices met some of these requirements before the Model began, especially offering 24/7 patient access to clinicians, and following evidence-based guidelines. Participating practices struggled to create Care Plans, including estimating beneficiary OOP costs, neither of which were well supported by their extant information technology systems.

In terms of quality, while there has been no overall impact on quality, there are some early indications of less hospital-based care at the end of life for beneficiaries served by OCM practices, including fewer inpatient admissions and ICU stays in the last month of life. There was no OCM impact on the rate of hospice use or timing of hospice entry.

We know that achieving meaningful practice transformation through mechanisms such as hiring new staff, upgrading EHRs, improving patient education, and leveraging new performance metrics and data for continuous quality improvement takes time. As OCM and its evaluation proceed in the coming years, we will continue to collect data directly from participants by conducting case studies with more OCM practices. We will also continue to survey patients and family members, and analyze claims data, to further investigate the early results described above, and explore additional relevant topics.